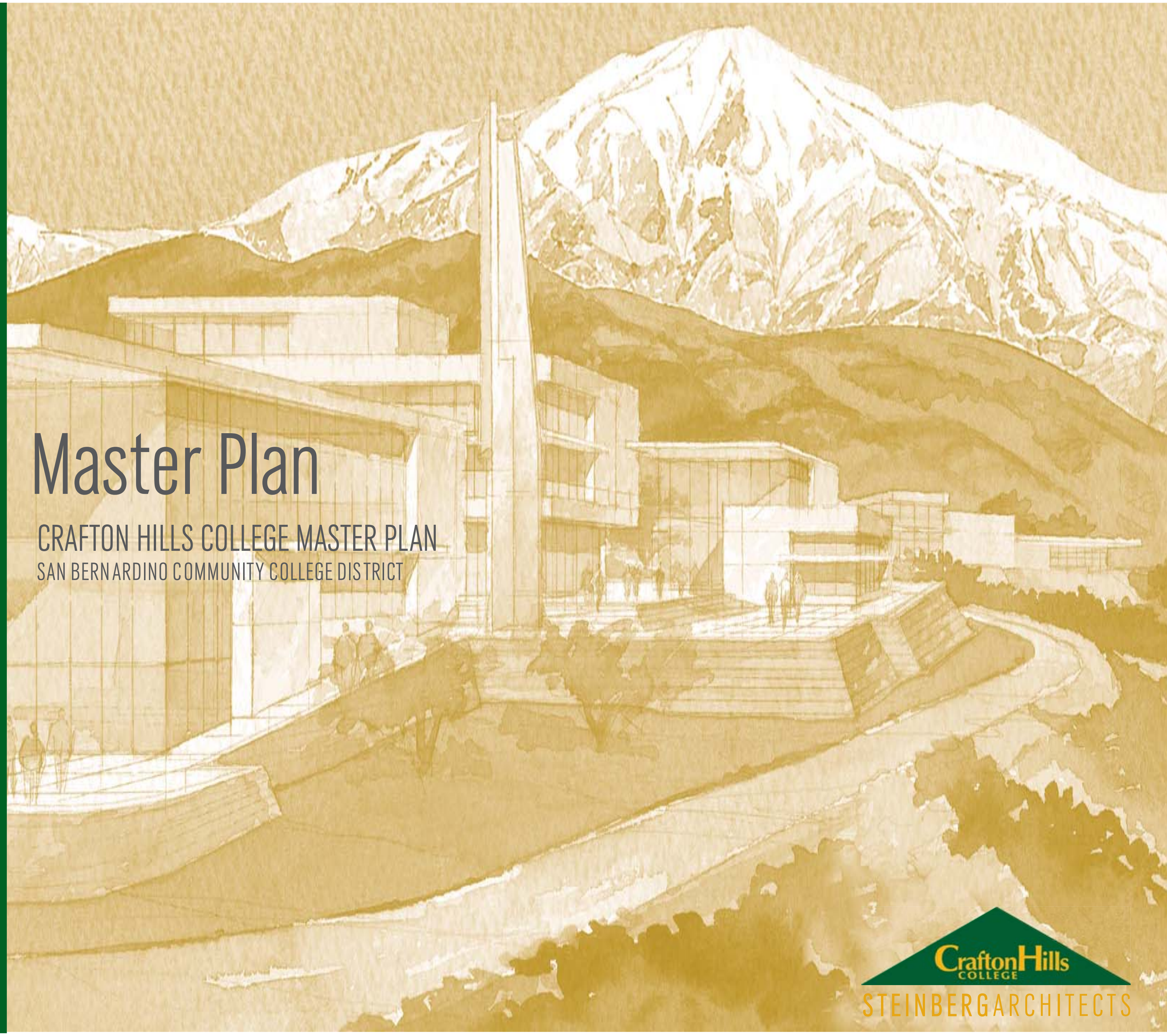
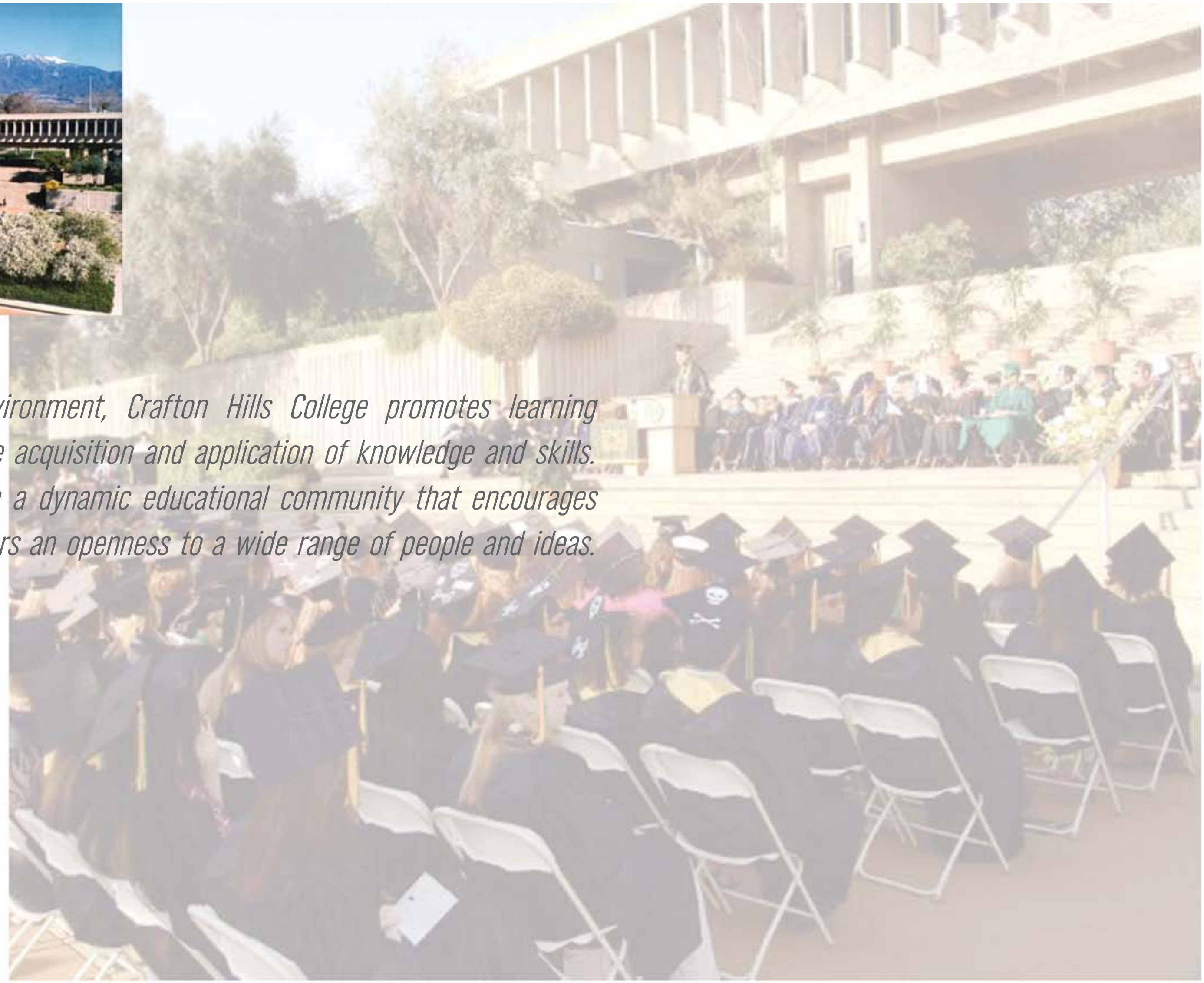
Volume 1 Master Plan

CRAFTON HILLS COLLEGE MASTER PLAN

SAN BERNARDINO COMMUNITY COLLEGE DISTRICT



STEINBERG ARCHITECTS



MISSION STATEMENT

In a serene, welcoming environment, Crafton Hills College promotes learning through self-discovery and the acquisition and application of knowledge and skills. This mission is carried out in a dynamic educational community that encourages intellectual curiosity and fosters an openness to a wide range of people and ideas.

Volume 1 Master Plan

OCTOBER 2005

1 | SUMMARY

OVERVIEW

As the first of four volumes, the master plan book describes the comprehensive plan that has been developed to address utilization and needs, facilities assessments, planning concepts, and aesthetics. Thus, it is intended to respond to the outcomes of both the master program book (volume two), in terms of program and building growth, and also to the facilities assessment report (volume three) that details the overall conditions for the site and the buildings. Phasing and implementation is discussed in volume four and includes campus infrastructure, building locations and phasing, and guidelines for architecture, landscaping, and beyond.

2025 Master Plan

PROCESS

In November 2002, the voters of San Bernardino County approved Measure P, which provides $190 million of bond funds to improve the facilities at San Bernardino Community College District's two colleges, San Bernardino Valley College and Crafton Hills College. In the fall of 2004, Crafton Hills College selected Steinberg Architects to develop and implement a master plan for the college. With the expectation of more than doubling in student enrollment, the master plan describes the first major additions and improvements to the campus since the college opened its doors in 1972.

The master planning process kicked off in January of 2005, and a series of workshops were held with the Master Plan Committee and the Instructional and Student Services councils. The result of the first of these workshops was the creation of goals for the master plan. Along with the college's mission statement, these goals have served as guiding principles for future planning. Meetings were conducted with the college's departments, not only in order to learn how current facilities were being used but also to determine what each department's future needs would be. A space utilization report was presented to the college, in which assignable square footage was confirmed and space use by department was identified. In addition to space needs, workshops for growth projections, programming, and planning were held.

Concurrent with these early meetings, the architect/consultant team performed an assessment study for all of the existing buildings, site, and infrastructure for the campus. The purpose of the study was to document current conditions, assess potential life safety issues, and make recommendations to bring the campus up to current standards and codes.

Further work with the college's committees identified organizational principles for planning concepts, and detailed site analysis studies were presented. An in-depth investigation considered options for phasing and implementation, both for scopes of work of new and existing buildings and site infrastructure as well as scopes of work for building locations and siting. Guidelines for architectural expression was established, and a comprehensive landscape plan was created. The culmination of all of these elements is the 2025 Master Plan.

MASTER PLAN

The goals outlined by the master plan have underscored every step of the process and are presented herein. The framework for future development is rooted in a study of the college's architectural predecessors, as well as in the context of its location and site. Site analyses have contributed to an overall understanding of the elements that make this campus and its environment unique. The identification and preservation of the character of this campus will set the tone for what follows.

A concept to organize and guide campus growth has been developed that groups departments, and therefore buildings, into clusters, within which the needs of the specific programs and users are better served. Variety of space and use is introduced throughout the campus, encouraging interaction and taking advantage of the college's natural setting.

The master plan reflects the ideas and concepts that have been laid out, with special consideration being given to the district's goals for growth and creating a plan that allows for flexibility in that timeline. The landscape master plan enriches and reinforces these precepts, not only defining the quality of each outdoor space but also reinforcing connections between clusters.

GOALS

STUDENT LIFE

To recruit and retain students at Crafton Hills College by offering courses and programs that meet their needs and by providing a cohesive academic and social life that meets their expectations.

To expand instructional programs by increasing courses available through Distance Learning and the Internet.

To increase the number of "hot spots" on campus by locating them within larger learning communities and furnishing them with spaces, food, technology, and resources appropriate to the activities.

To distinguish Crafton Hills College through its course offerings, which are scheduled to accommodate students' lifestyles, and to allow the successful completion of programs in a timely manner.

FACULTY & STAFF LIFE

To provide an atmosphere that fosters and supports faculty and staff interaction, faculty training in new technologies, and the development of new instructional programs

COMMUNITY

To enhance the identity of Crafton Hills College in the community.

To create an inviting environment that promotes community involvement.

To provide programs and facilities that meet the needs of the community.

ACCESS

To provide easy access to information, resources, and services at the college.

To provide student services any time, any place, any pace.

To improve the navigation, accessibility, and identification of the campus during all hours of operation.

CAMPUS ENVIRONMENT

To create state-of-the-art buildings that responsibly address and accommodate the projected growth for the college while maintaining the park-like atmosphere and architectural integrity of the campus.

To create a physical framework and infrastructure that will allow Crafton Hills College the flexibility to grow and adapt as technology and instructional methods evolve.

2 | CONTEXT

HISTORY | E. STEWART WILLIAMS

photo from The Palm Springs Historical Society

"As an expression of the physical and social environment that produced it, architecture has the potential ability of being the greatest art of its time."
- E. Stewart Williams. [1]

Born in 1909, Stewart Williams grew up in Dayton, Ohio. He studied architecture at Cornell University and the University of Pennsylvania and subsequently taught at Columbia University from 1934 to 1938. Williams traveled through Europe in the late 30s before a brief stint working for Raymond Loewy. He joined his father, Harry, and brother, Roger, in Palm Springs in 1946 and they formed the architecture firm of Williams, Williams, and Williams. After their father's passing in 1957, another regional architect, John Porter Clark, joined the firm in the early 1960s.2

Architectural styles in Palm Springs and the surrounding communities ranged from traditional Spanish stucco and red tile roofs to the cool aesthetic of the International and Modernist schools. European Modernists, including Mies van der Roehe, Le Corbusier, Walter Gropius, and Adolph Loos, had begun to develop building styles that were reactions against the traditional, and often state sponsored, building types. Eschewing ornament and symmetry, their creations were radical departures from the norm; they believed that architecture should serve as an instrument of moral and social reform, and they embraced new materials and construction methods. Glass, steel, concrete, and wood became the favored building materials, while open floor plans, overlapping planes, and volumetric expression changed interior space planning, exterior forms, and facades.

Many of the well-known architects already practicing in California, such as Rudolph Schindler, Richard Neutra, and Albert Frey, had begun to apply the ideals espoused by their European predecessors in the Modern movement. However, their interests lay less with socio-political philosophies and more in the forms and materials. Williams, and many of his contemporaries practicing in the 1940s and 50s in the region, experimented with emerging styles of California architecture, adapting them to the unique climate of the Palm Springs area. The resulting distinctive architectural style has come to be known as Desert Modernism.

Williams was particularly interested in achieving a balance between the building and its environment, embracing and capturing the beauty of the natural setting. In early works such as the Sinatra and Edris houses, the siting of the buildings intrude minimally onto the landscape and large expanses of glass create a sense of continuity between the interior and exterior. The steel structure is light, as are the sloping, cantilevered roof forms.

He continued to experiment with materials, and concrete predominated his later work. Williams once remarked, "I don't like stucco or paint - let the natural beauty of the material be the thing you see on the finish."[3] Later works - Coachella Valley S&L, Crafton Hills College, and the Palm Springs Desert Museum - reflect that sensibility. The concrete is used as both structure and facade, and texture is provided through exposed formwork patterns and embedded materials such as stone.

Figure 2. Frank Sinatra House. 1946.
photo by: Jonathan Becker

Figure 4. Edris House. 1954.
photo by: David Glomb

Figure 5. Coachella Valley Savings and Loan. 1961.
photo by: Monica Lee

Figures 6, 7, and 8. Palm Springs Desert Museum. 1976.
photos by: Julius Shulman

HISTORY | BRUTALISM

The development of E. Stewart Williams' architecture - from the use of primarily steel and glass to the use of concrete - illustrates his shifting focus from the Modernism of Mies van der Roehe's minimalist expressionism to Le Corbusier's sculptural monumentalism. Beginning with the Unité d'Habitation at Marseilles and the Dominican monastery of La Tourette, Le Corbusier began to favor textured, unfinished concrete that allowed for the visual expression of the means of construction. This technique is generally referred to as béton brut, which translates to rough or raw concrete, and it grew into a movement, of which Le Corbusier is considered to be the father. Hallmarks of the style include repetitive forms, geometric interplay, mass, solidity, and functional transparency.

Le Corbusier's influence in architectural circles was widespread, and many architects began to use raw materials, to reveal the construction process, and to experiment with mass and scale. Peter and Alison Smithson in Britain were among the first to adopt the style. The Smithsons worked primarily with steel, glass, precast concrete slabs, and brick, and frequently exposed piping and electrical conduits. Architects such as Sir Denys Lasdun in Britain and Paul Rudolph in the U.S. followed in Le Corbusier's footsteps, preferring to use cast in place concrete. Rudolph's Art and Architecture building at Yale University illustrates a collision of volumes and complexity of interior space. The towers house mechanical functions, and the seemingly rational glass and concrete facade belies the 39 levels on 7 different stories inside. Lasdun's Royal National Theater in London is truly monumental in scale, with layered forms, tower masses, and exposed walkways.

Brutalism continued to develop in North America into a typology frequently associated with civic and collegiate institutions, as the elements that typify the style can be translated quite literally into representations of the values and goals of social and political associations. Boston City Hall, designed by Kallman, McKinnell, and Knowles, epitomizes these tendencies. It stands as an object within a monumental brick plaza and has become an important civic symbol viewed from great distances throughout the city. In a seeming reversal of scale of materials, its red brick base contrasts with the stepped, concrete upper stories and oversized projections that partially shade the areas below. The ground floor is largely open to the elements, and those spaces which are enclosed are large in scale. Significant interior spaces are expressed as sculptural elements on the facade, interrupting the overall rhythm of the building.

Figure 1. Unité d'Habitation. Marseilles. 1946-52.
photo from Wikipedia.
Figure 2. La Tourette. Eveux-sur-Arbresle. 1953-60.
photo still from film by Richard Copans.
Figure 3. Art & Architecture Building. Yale University. 1958-63.
photo from Mary Ann Sullivan, Bluffton University.

Figure 4. Royal National Theater. London. 1967.
photo from Wikipedia.

Figure 5. Boston City Hall. 1963-68.
photo from Geoffrey J. King, University of Texas.

HISTORY | BRUTALISM

Simon Fraser University, just outside Vancouver, is located atop Burnaby Mountain and bears a striking resemblance to Crafton Hills College, both in setting and in architectural expression. The buildings that form the academic quad are raised above the surrounding green, providing sheltered walkways underneath. Circulation and mechanical cores and structural columns anchor the building to the ground, supporting classrooms and offices above. The highly repetitive facades are comprised of concrete fins and small glass windows. Louis Kahn's Salk Institute is another example of an educational and research facility employing untouched concrete and repetition of building units. In this instance, teak is used an infill panel to contain the glazing units and vary the texture within the plane of the facade.

I. M. Pei, in conjunction with lead designer Araldo Cossuta, further refined the use of exposed concrete in their design for the Christian Science Center in Boston, tempering the grand scale of the buildings and plazas with highly detailed, classicizing elements. Concrete joints and human-scale light fixtures acknowledge the importance of creating pedestrian friendly areas immediately adjacent to sheer walls that can exceed 60 feet in height.

Figure 6. Simon Fraser University. British Columbia. 1965.
photo by: R. Mueller.
Figure 7. The Salk Institute. La Jolla. 1959-1966.
photo by: Till S. Hartmann.

Figure 8. The Christian Science Center. Boston. 1968-74.
photo by: Donald Corner and Jenny Young.
Figure 9. The Christian Science Center. Boston. 1968-74.
photo from the Kidder Smith Slide Archives.

HISTORY | CRAFTON HILLS COLLEGE

Crafton Hills College is sited in the foothills of the San Bernardino Mountains and overlooks the Yucaipa Valley, sitting on 523 acres of land donated by Ruben and Lester Finkelstein. It opened in the fall of 1972 with an enrollment of approximately 1000 students. At that time, the campus was comprised of five buildings that housed the library, laboratories, classrooms, student services, and a dining hall, which form the heart of campus today.

By 1980 the campus had grown to include a performing arts center, a gymnasium, and vocational arts buildings, and major additions to the library and laboratory center were completed. From the mid-90s to the present, the campus has added a student services annex, a child development complex, and a new bookstore.

From 1970 to 1978, three firms worked together to design and build the majority of the college's buildings. Williams, Clark, and Williams, Richard L. Poper, and Jerome G. Armstrong formed the Valley College Architects Collaborative, and Stewart Williams was the lead designer. In 1974, they received the first Award of Excellence given by the Inland chapter of the American Institute of Architects.

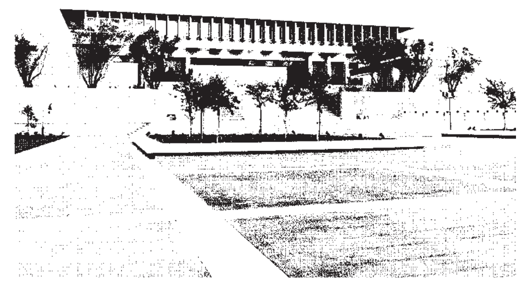
Brutalist Modernism is the prevalent architectural style of the college, due to Stewart Williams' continued involvement in design on campus for more than ten years. The cantilevered roof forms favored in his early work are translated in these buildings into monumental, floating forms comprised of an entire story. Stair cores and mechanical shafts are clearly expressed through facades, at times forming the structure that supports the building above. Concrete fins are utilized throughout, breaking up what would otherwise be continuous ribbon windows into small window units. The concrete formwork that was used during construction is evident on every facade, namely in the form of tie holes, deep joints, and variegated textures.

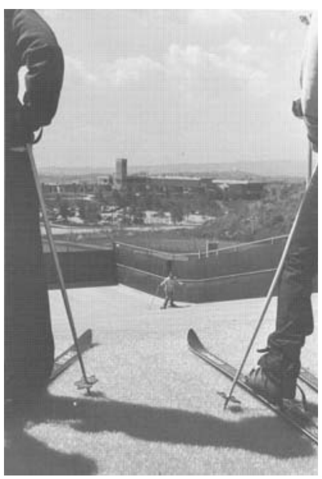


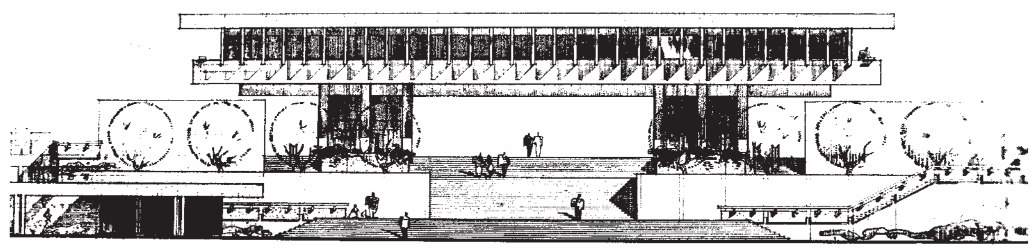




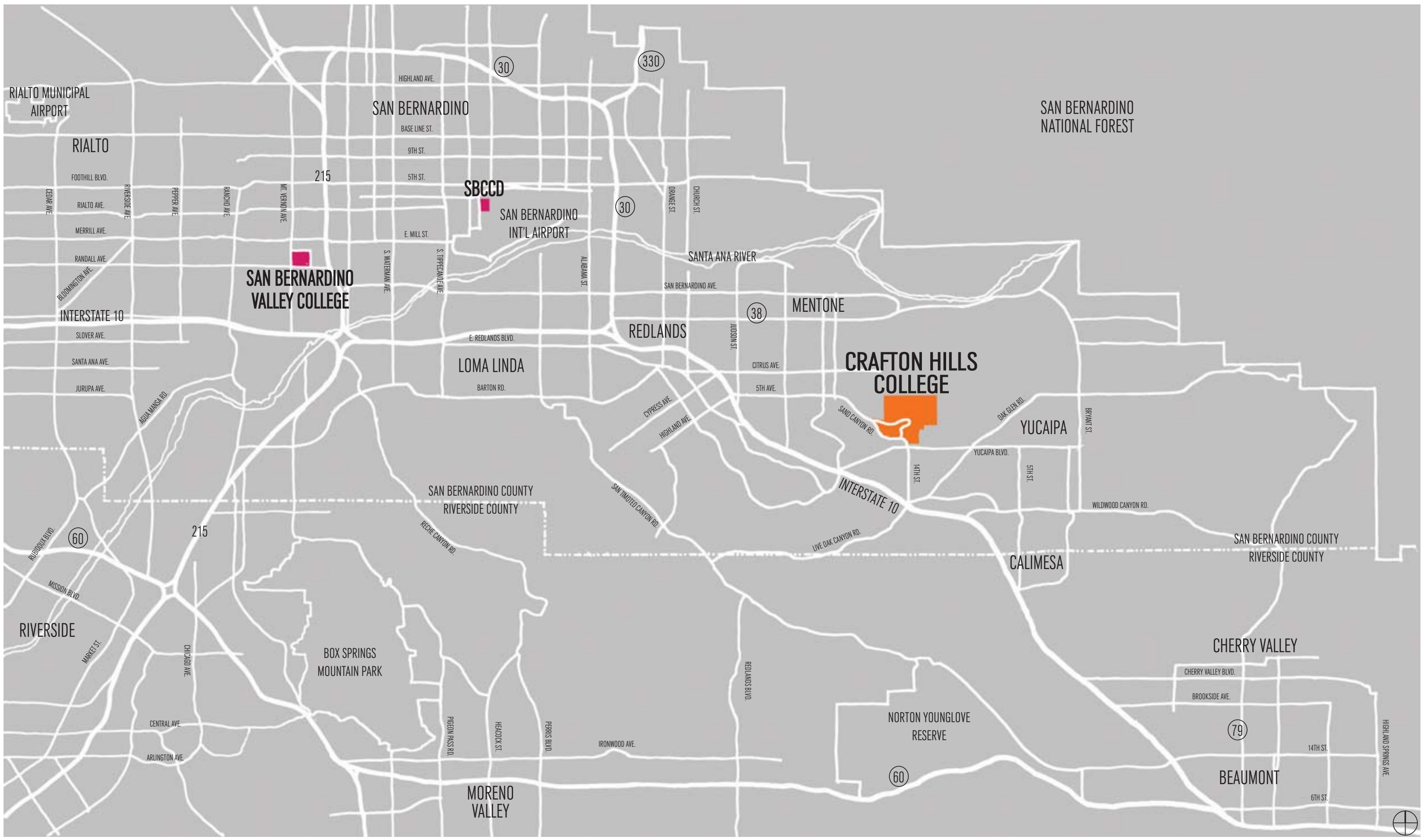
HISTORY | CRAFTON HILLS COLLEGE







VICINITY MAP



LAND USE

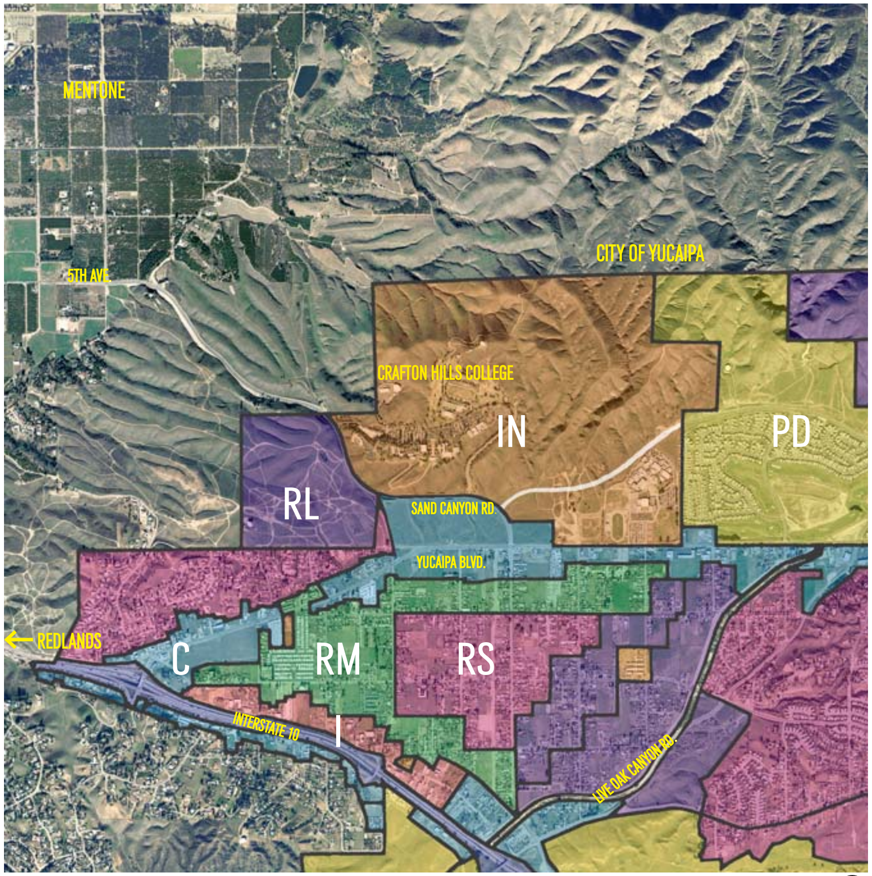


Figure 1. Aerial photograph with land use districts.

RL - Rural Living
RS - Single Residential
RM - Multiple Residential
C - Commercial
PD - Planned Development
IN - Institutional
I - Industrial

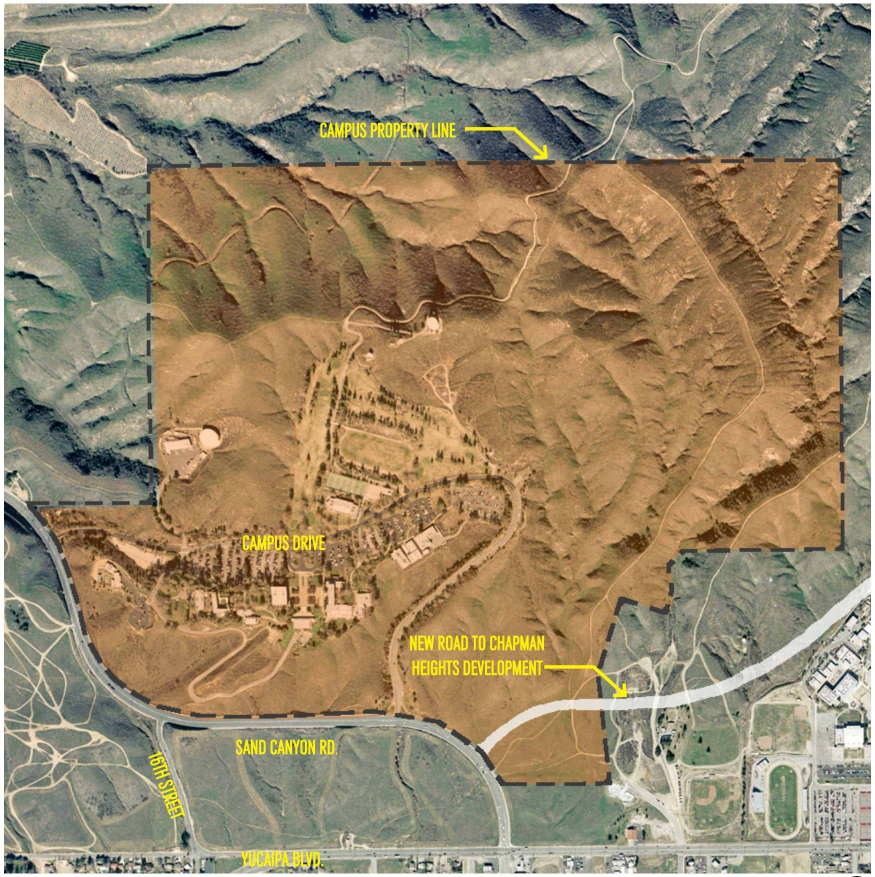
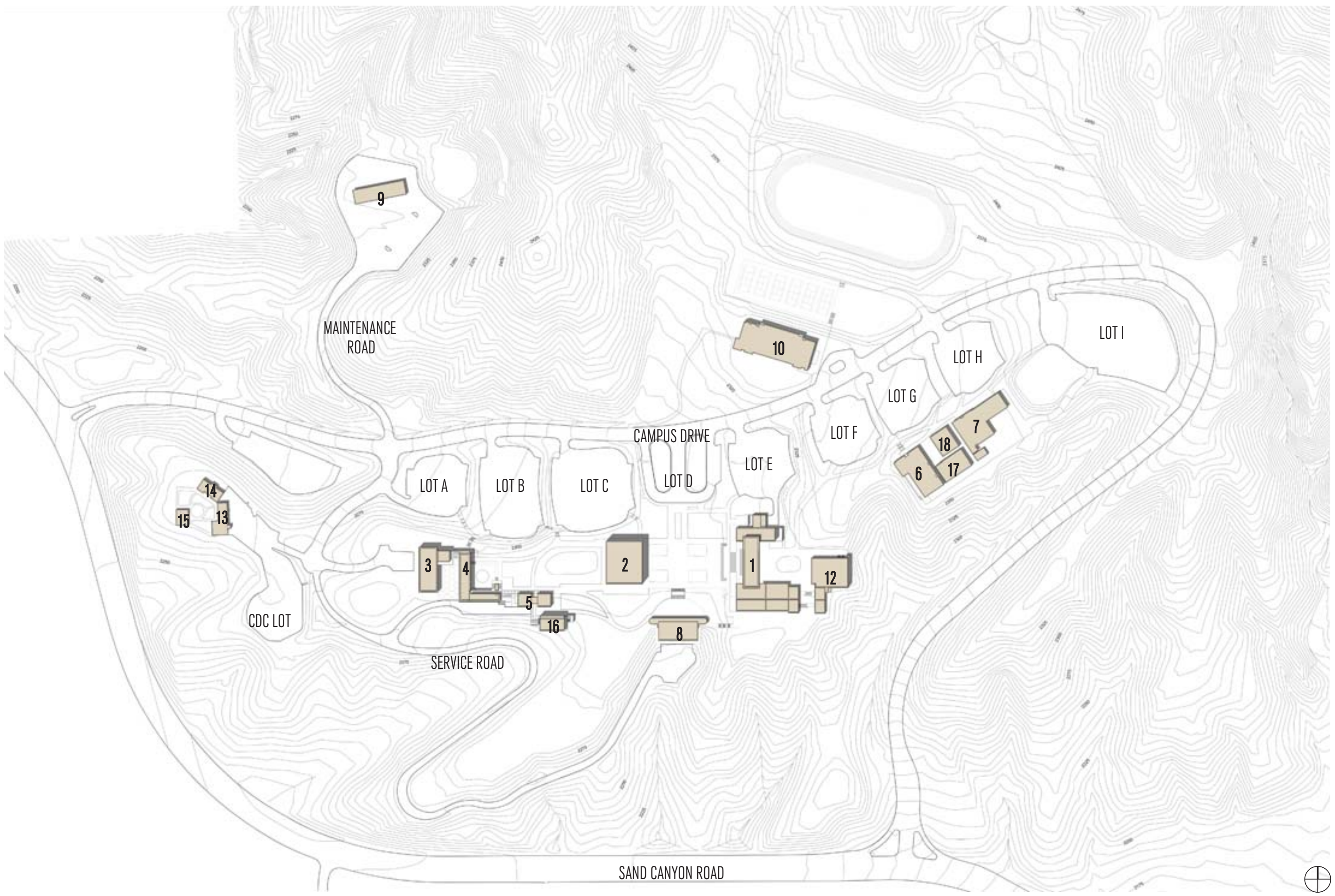


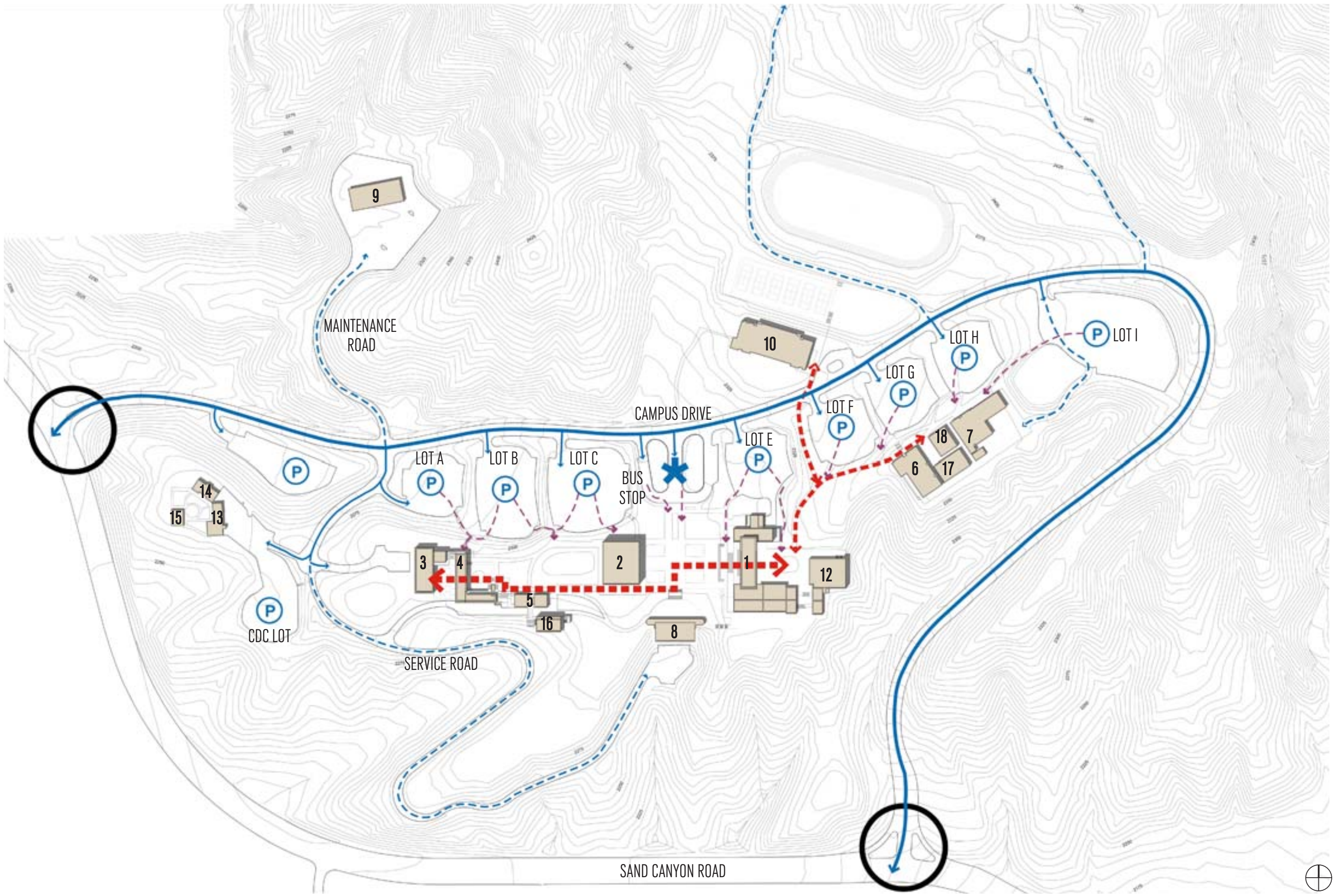
Figure 2. Crafton Hills College property lines.

EXISTING CAMPUS PLAN



NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

CIRCULATION



Crafton Hills College has two main entrances to the campus from Sand Canyon Road. Vehicles enter via the southern or western entrances and circulate along Campus Drive to a series of parking lots at the northern side of the main campus. Visitors move from the parking lots through a landscape zone to campus buildings.

Pedestrian circulation occurs along a major spine from College Center, past the Library, to the Chemistry building. A secondary circulation path leads from the Laboratory/Administration quad and branches off towards the athletics complex or towards the Occupational Education buildings and bookstore.

Service access to the Maintenance and Operations building occurs via a narrow road extending north from Campus Drive. There is also a service road around the peninsula to the Performing Arts Center.

LEGEND

- VEHICULAR
- SERVICE VEHICLE
- PEDESTRIAN
- ACCESS FROM PARKING
- CAMPUS ENTRY
- MAIN ARRIVAL POINT

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
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CIRCULATION | VEHICULAR

CAMPUS DRIVE LOOKING NORTH & EAST FROM MAIN ARRIVAL POINT

CAMPUS DRIVE LOOKING EAST FROM WEST ENTRY

SOUTH ENTRY AT SAND CANYON ROAD

CIRCULATION | PEDESTRIAN


MAIN PEDESTRIAN SPINE - EAST/WEST


MAIN PEDESTRIAN SPINE - EAST/WEST

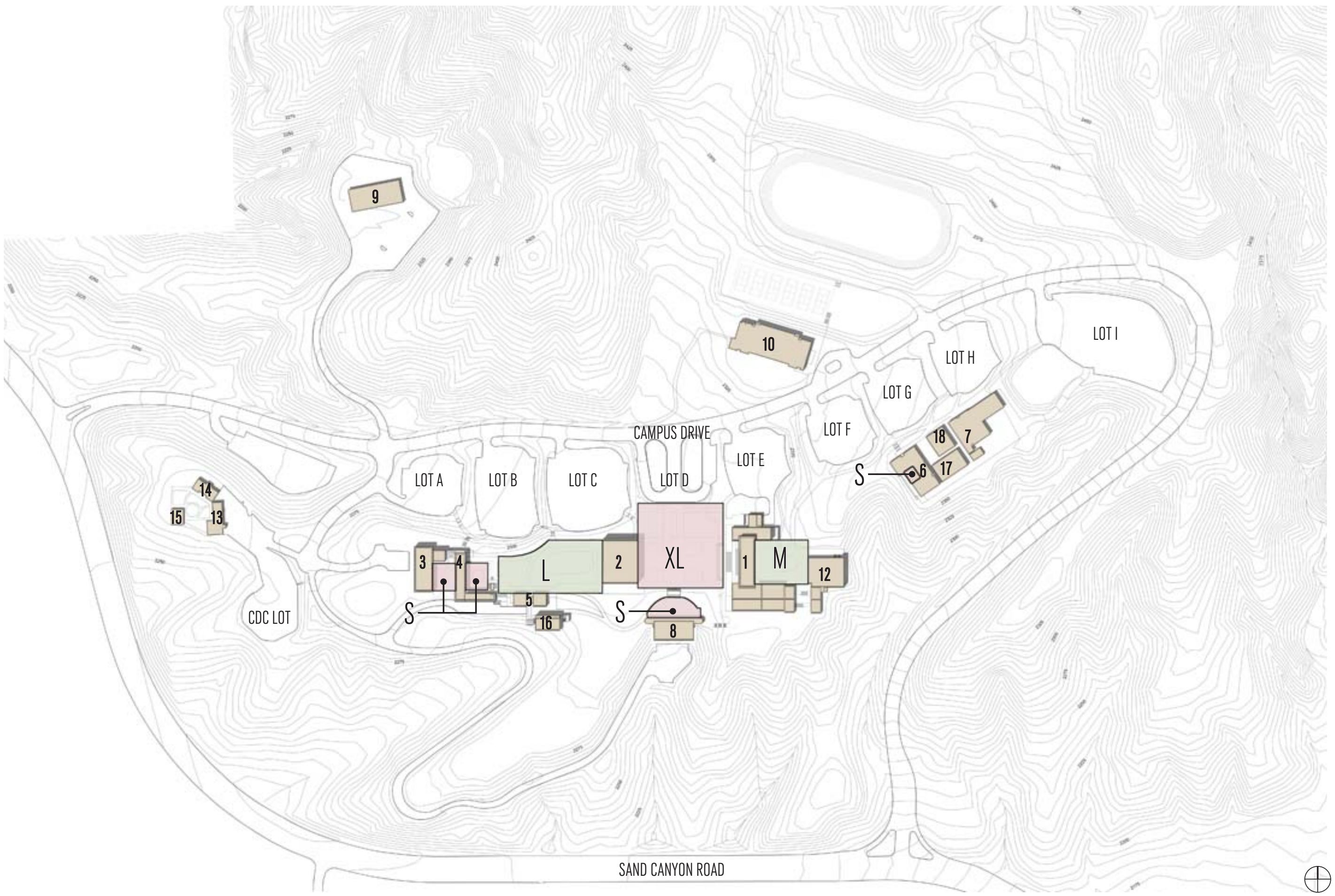

EDGE CONDITION AT CHEMISTRY/ HEALTH SCIENCES


SECONDARY SPINE AT OCCUPATIONAL EDUCATION 2


LOWER PATH AT STUDENT SERVICES B


PEDESTRIAN ACCESS FROM LOT A TO STUDENT SERVICES A

EXTERIOR SPACES



The college has a variety of exterior spaces that are defined by adjacent buildings. Their variations in character are due in part to their sizes.

- Small spaces such the courtyard by College Center act as rooms; they are intimate in scale and their "walls" are created by the surrounding architecture.
- Medium sized spaces contain small seating areas that concentrate occupied space along the edges.
- Large spaces are typified by little occupiable space. Circulation occurs primarily at the edges.
- The Central Quad is an extra large space, given its vast area. Primary circulation occurs in a cruciform pattern, linking the drop off area to the Performing Arts Center and the Library to the Administration building. Secondary circulation occurs around the edges of the space.

LEGEND

HARDSCAPE

LANDSCAPE

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
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EXTERIOR SPACES

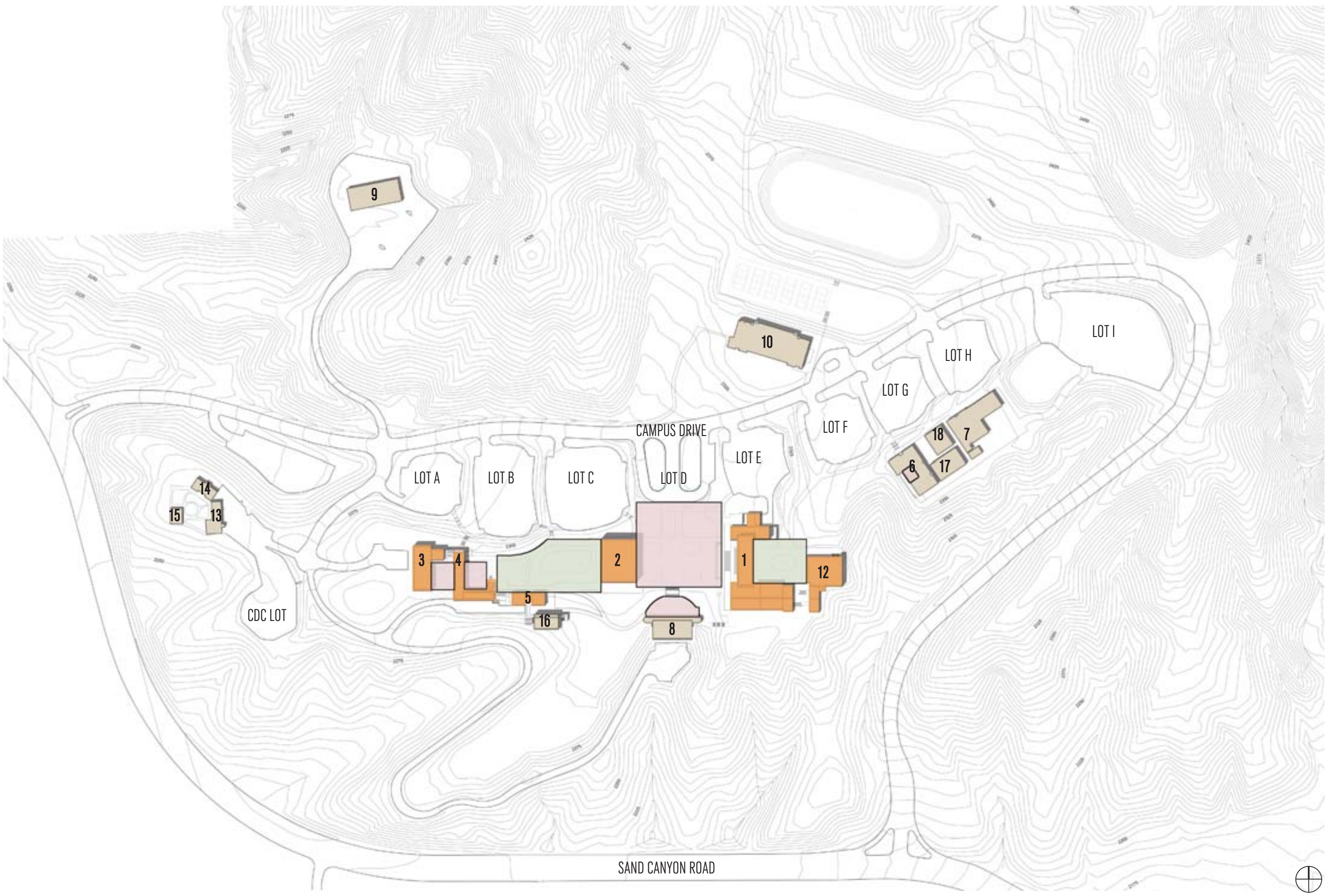
SMALL - COLLEGE CENTER COURT

LARGE - CENTRAL GREEN

MEDIUM - SCIENCES GREEN

EXTRA LARGE - CENTRAL QUAD

BUILDINGS



Some of the buildings on campus can be grouped together due to their proximity, similarities in program, and construction dates. These include:

- Child Development Complex
- Student Services (includes classrooms)
- Mathematics and Sciences (includes the Administration wing)
- Occupational Education and Bookstore (includes classrooms)

The Library, Performing Arts Center, and Gymnasium buildings stand apart from their surroundings, acting as objects among the landscape.

There are five buildings on campus deemed architecturally significant due to their association with the Brutalism movement of the 1960s and 1970s. The distinct character of College Center, Student Services A, Classroom Building, Laboratory/ Administration, and Chemistry/ Health Sciences will be maintained as the campus grows and changes.

LEGEND

- HARDSCAPE
- LANDSCAPE
- SIGNIFICANT BUILDINGS

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
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BUILDINGS

COLLEGE CENTER, STUDENT SERVICES A

CLASSROOM BUILDING

LaBORATORY/ADMINISTRATION

LIBRARY

TRANSITIONS

The two bridge structures at Student Services A and Laboratory/ Administration and the monumental stair leading from the Central Quad to the Performing Arts Center function as threshold spaces on the campus. At these junctures, visitors not only pass through one distinct exterior space into another, but they also move between levels. These unique elements act as architectural gateways between spaces of different scales and allow for expansive views of the architecture, the campus landscape, and the city.

On a larger scale, there are areas between buildings or groups of buildings that serve as transition spaces. Visitors move through these transition zones that separate building groups, traversing broad spans of landscape or hardscape.

LEGEND

THRESHOLDS

TRANSITIONS

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
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TRANSITIONS

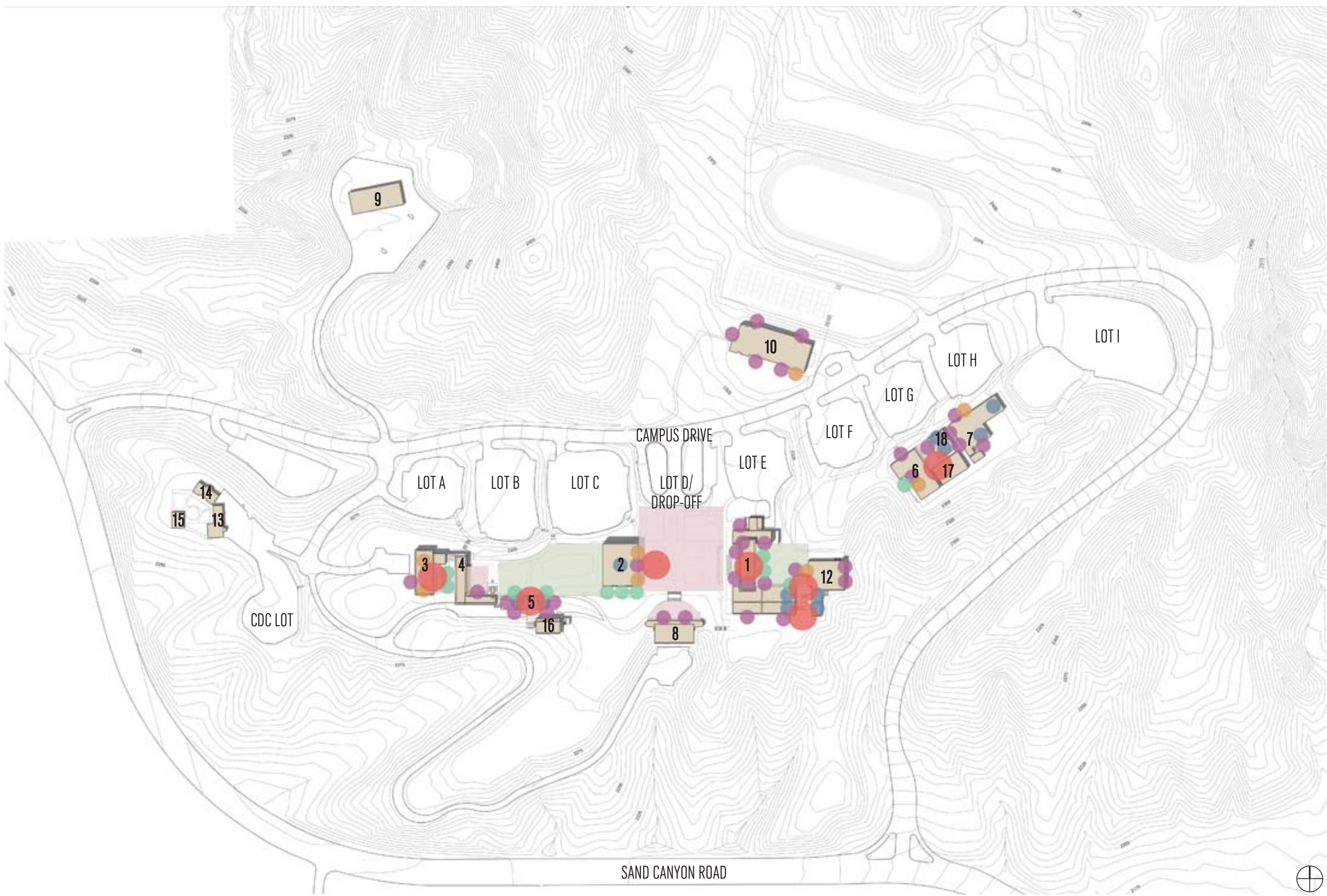
TRANSITION - VIEW OF STUDENT SERVICES B & LIBRARY

THRESHOLD - STAIR FROM PERFORMING ARTS CENTER

TRANSITION - VIEW OF LABORATORY/ ADMINISTRATION BUILDING

THRESHOLD - STUDENT SERVICES A BRIDGE

HOT SPOTS



Hot spots are areas on campus that act as gathering spaces; they are centers of concentrated activity and energy. There are four elements illustrated that serve as "attractors," bringing people to a given space:

- Large classrooms or lecture halls
- Building entries
- Food service or vending machines
- Trees and seating

Hot spots on campus possess a combination of all of these elements.

LEGEND

- MAJOR CLASSROOMS
- BUILDING ENTRIES
- FOOD SERVICE/ VENDING
- TREES & SEATING
- HOT SPOTS

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HOT SPOTS


DINING HALL AT COLLEGE CENTER


STEPS AT CHEMISTRY/HEALTH SCIENCES & LABORATORY/ADMINISTRATION


LABORATORY/ADMINISTRATION BRIDGE


CLASSROOM BUILDING

Master Plan | 3

3 | MASTER PLAN

CONCEPT

The Crafton Hills College master plan concept is derived from the goals and vision of the College, the architectural character of the campus, and a thorough analysis of the site and landscape context.

The collective goals provide an overall direction for the master plan; however, specific elements became key drivers for the plan. First was developing a plan that would enhance the overall student experience, facilitate the development of student life, and be responsive to students' busy lifestyles. In order to achieve these student oriented goals, it was found to be equally important that the plan provide an atmosphere that fosters faculty, staff, and student interaction.

The cluster concept as a campus organizing principal, upon which the original campus plan was based, was developed as a way to bring students, faculty, and staff together for a common purpose while addressing their individual needs. The cluster concept creates distinct, clearly defined areas of interconnected buildings and exterior spaces occupied by related college departments to provide a concentration of physical and intellectual resources. Each cluster will have its own identity that is reflective of the unique culture of different disciplines, programs, and departments.

A second key goal was to enhance the presence of Crafton Hills College in the greater community, while creating state-of-the-art facilities for learning that are respectful of the existing architecture.

Crafton Hills College has lain hidden in the hills and shrouded by the landscape for many years. One of the major goals of the master plan is to enhance the identity of the college in the community. New buildings, arranged along the southern edge of the campus and extending out onto the southernmost peninsula, greatly increase the visibility of the campus to the community. A complimentary architectural approach has been developed that is inspired by the existing architecture, but it is driven by the objective of the college for facilities that are more adaptable, flexible, and cost effective.

A third key goal was to provide access to information, resources, and services with a campus that was welcoming, accessible, and easy to navigate. In response, the overall planning framework defines major campus zones, distinct clusters, transition spaces between clusters, vehicular and service access, major and minor pedestrian paths, and a variety of exterior spaces in both scale and character.


COMMUNITY
EMERGENCY SERVICES
HEALTH/ PHYSICAL EDUCATION
MAINTENANCE & OPERATIONS
CAMPUS DRIVE
SCIENCES/ MATH/ BIT
STUDENT CENTER
FINE ARTS
STUDENT SERVICES
HUMANITIES
CHILD DEVELOPMENT & EDUCATION
SAND CANYON ROAD

CLUSTERS

Each cluster consists of interconnected buildings and exterior spaces occupied by related college departments to provide a concentration of physical and intellectual resources. The clusters create focal points throughout the campus, which build upon the existing 'hot spots' on campus, bringing together academic functions, faculty resources, and student amenities. Clusters will be developed to include a range of the following: classrooms, teaching labs, open labs, meeting rooms, group study rooms, informal study areas (indoor/outdoor), food, access to technology, technology support, faculty/staff offices, and faculty/staff resources.

Although a consistent architectural style is woven throughout the campus, each cluster will have its own identity that is reflective of the unique culture of different disciplines, programs, and departments. The Emergency Services cluster (upper left) sits northeast of the central campus and takes advantage of canyon-like views to the south and affords a view back to the central campus some fifty feet below to the southwest. The Humanities cluster (lower left) extends out onto the southern-most peninsula of the campus, allowing for panoramic views of the San Bernardino Mountains to the north and the Yucaipa Valley to the south.

TRANSITIONS

Whereas the cluster concept will work to create focused areas on the campus, the transition spaces between the clusters are equally important for they create the buffer and separation between clusters. However these are not leftover spaces; rather they form essential links between clusters and provide spaces for relaxation, recreation, and special events. Some of the spaces are ceremonial and open like the Central Quad (top left) that provides a visual front door for the campus and will be used for graduations. Other spaces are informal and active like the "Living Wall" (lower left) that provides connections between four clusters and key vertical transitions while creating places for people to gather.

IDENTITY

Crafton Hills College has lain hidden in the hills and shrouded by the landscape for many years. One of the major goals of the master plan is to enhance the identity of the college to the community, and new buildings are arranged along the southern edge of the campus, extending out onto the southernmost peninsula of the campus and greatly increasing the visibility of the campus to the community.

Rather than replicate the brutalist structures designed by Stewart Williams, a complimentary architectural approach has been developed that is inspired by the existing architecture but is driven by the objective of the college for facilities that are more adaptable, flexible, and cost effective. In addition, it is recommended that new structures be constructed of steel rather than concrete due to the site-specific seismic conditions. In keeping with the modern architectural vocabulary, the new identity is defined by five key elements:

1. Floating: with roof overhangs and recessed horizontal glazing, the new architecture will create a floating quality that responds to the cantilevered and bridge-like characteristics of the existing structures.

2. Transparency: the new architecture will be more open and revealing of the internal programmatic functions and will take advantage of the views more than the existing structures.

3. Entry: entries will be clearly defined, welcoming, and oriented to open out into new and renovated plazas and courtyards.

4. Base: the concrete mass utilized in the architectural vocabulary of the existing structures will be used to create the base of the new architecture - forming retaining and foundation walls and providing a visual connection to the existing structures.

5. Threshold: just as the existing structures create gateways between spaces of different scales, the new architecture creates thresholds and expansive views through the integration of building placement, site elements, and landscape.

ACCESS

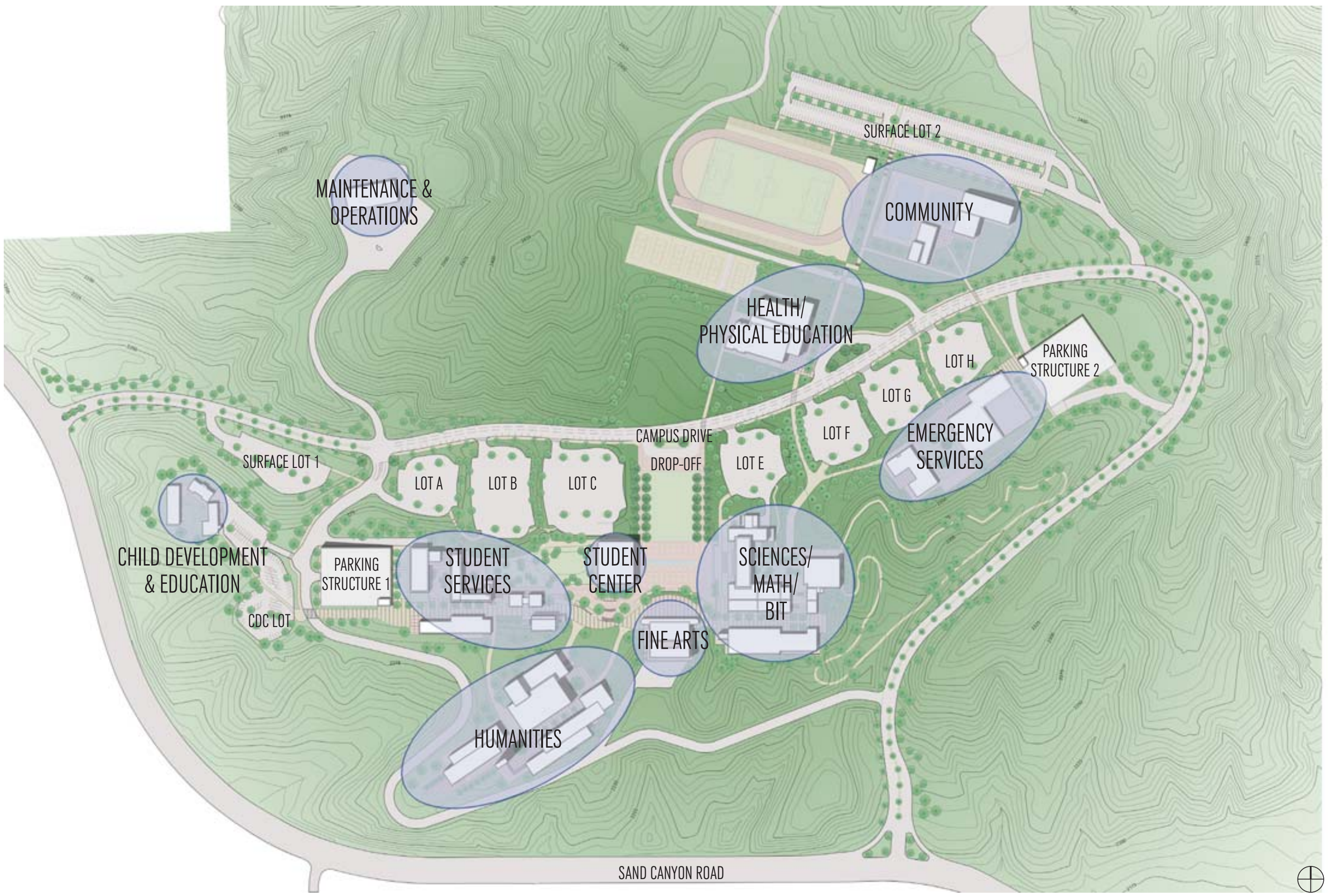
Crafton Hills College will continue to have two main entrances to the campus from Sand Canyon Road that enter onto Campus Drive with a series of surface parking lots extending from the eastern to the western edge of campus. The master plan reconfigures the main drop-off and Central Quad that interrupts the ribbon of parking to create a clear visual center for the campus which will help orient first time visitors. The master plan adds two parking structures, one at either end of the campus. The structures are located at the extent of campus for ease of vehicular entry and exit, as well as to anchor the two major pedestrian spines developed for the campus. The new east-west pedestrian spine (at left), which includes an upper and lower pathway, will extend from Parking Structure 1 to the "Living Wall" and through to the new Science Building. The new drop off, parking structures, and pedestrian spines will improve accessibility, navigation, and orientation for students, faculty, staff, and visitors.

MASTER PLAN

NO.	BUILDING NAME
1	LABORATORY CENTER (former Laboratory/Administration Building)
2	**STUDENT CENTER**
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C (former Classroom Building)
6	OCCUPATIONAL EDUCATION 1
7	**EMERGENCY SERVICES** (OE2 replacement building)
8	PERFORMING ARTS CENTER
9	**MAINTENANCE & OPERATIONS**
10	GYMNASIUM
11	**WELLNESS CENTER**
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	**CHILD DEVELOPMENT CENTER EXPANSION**
16	STUDENT SERVICES B
17	DEMOLISHED - BOOKSTORE
18	DEMOLISHED - CLASSROOMS
19	**ADMINISTRATION/ STUDENT SERVICES**
20	**LEARNING RESOURCE CENTER**
21	**HUMANITIES 1**
22	**HUMANITIES 2**
23	**PERFORMING ARTS CENTER EXPANSION**
24	**SCIENCES**
25	**COMMUNITY RECREATIONAL FACILITY**
26	**COMMUNITY CENTER**

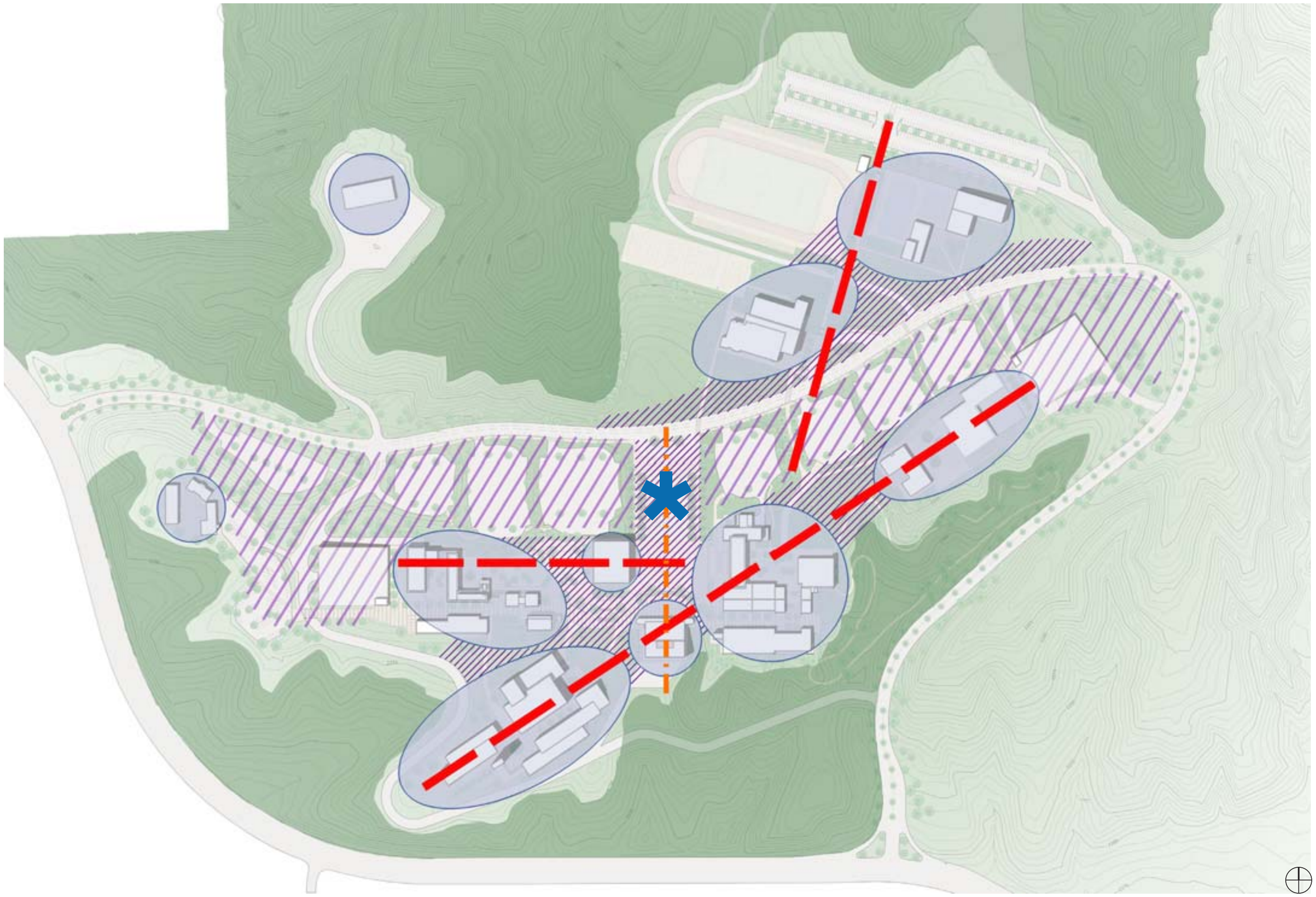
* New Buildings are indicated by bold font.

CLUSTER PLAN



PROGRAMS:	*SPACE TYPES:*
CHILD DEVELOPMENT & EDUCATION	
Child Care	Classrooms
Developmental & Educational Programs	Offices
STUDENT SERVICES	
Admissions & Records	Conference Rooms
CHC Administration	Offices
Counseling & Testing	Testing Spaces
Financial Aid	
Registration	
HUMANITIES	
General Assignment	Classrooms
Language Arts	Labs
Social Science	
FINE ARTS	
Music	Arts Studios
Performing Arts	Auditorium/ Theater
Visual & Applies Arts	Black Box Theater
	Labs
	Offices
SCIENCES/MATH/BUSINESS & INFORMATION TECHNOLOGY	
Biological & Chemical Sciences	Classrooms
Business & Information Tech.	Computer Labs
Mathematics	Lecture Halls
Physical Sciences	Offices
Police	Wet Labs
EMERGENCY SERVICES	
Allied Health	Classrooms
EMS	Labs
Fire Academy	Offices
HEALTH/PHYSICAL EDUCATION	
Athletics	Gymnasium
Health Education	Locker Rooms
Physical Education	Multi-purpose Rooms
	Weight Rooms
COMMUNITY	
Aquatic Center	50M Pool
Community Recreational Facility	Locker Rooms
Community Center	
STUDENT CENTER	
Associated Student Body	Bookstore
Bookstore	Classrooms/ Labs
Cafeteria	Dining Facilities
	Meeting Rooms
MAINTENANCE & OPERATIONS	

FRAMEWORK



The cluster concept is a portion of a larger planning framework that defines zones for vehicular circulation with a clear drop off area, a parking zone, an academic/student core, and an athletics and community area. Within this framework, there is also the development of green spaces at the transition zones and the preservation of the hillside landscape.

VEHICULAR

PEDESTRIAN

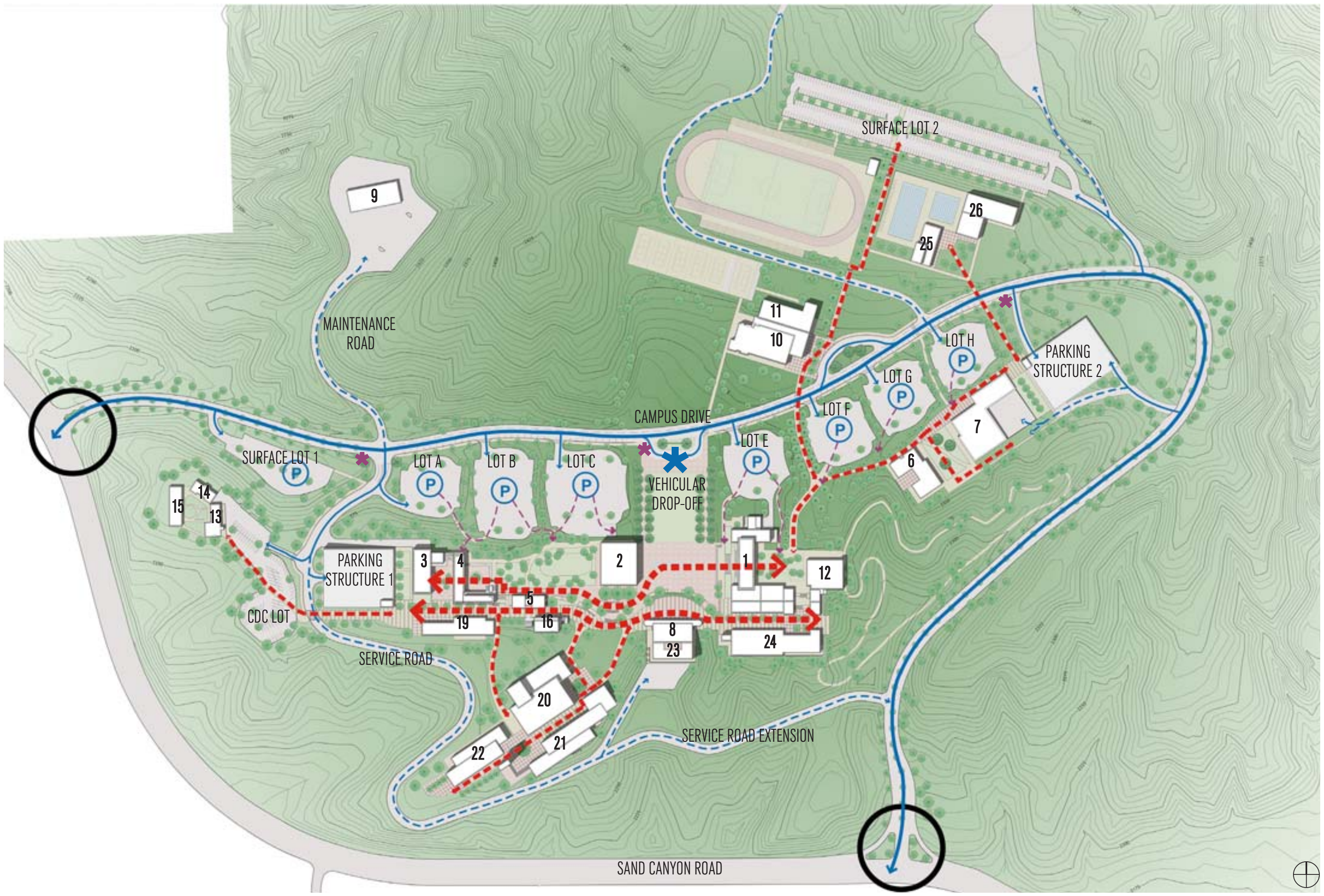
CAMPUS CORE

TRANSITIONS

HILLSIDES AND CANYONS

MAIN ARRIVAL POINT

CIRCULATION



The main vehicular route on Campus will be enhanced with landscape medians and turning lanes for improved traffic flow, and the entrances to all surface parking lots will be widened for ease of access.

The pedestrian spine running through the center of the original campus will be augmented by a second major pathway running through the newer, lower portion of campus from Parking Structure 1 to the new Sciences building. The heart of campus will now be occupied by a major circulation element that includes stair, ramp, seating, water, and landscape components. This "living wall" will tie together the upper and lower campuses, bridging the gap between the new Student Center and the Humanities cluster at the Peninsula.

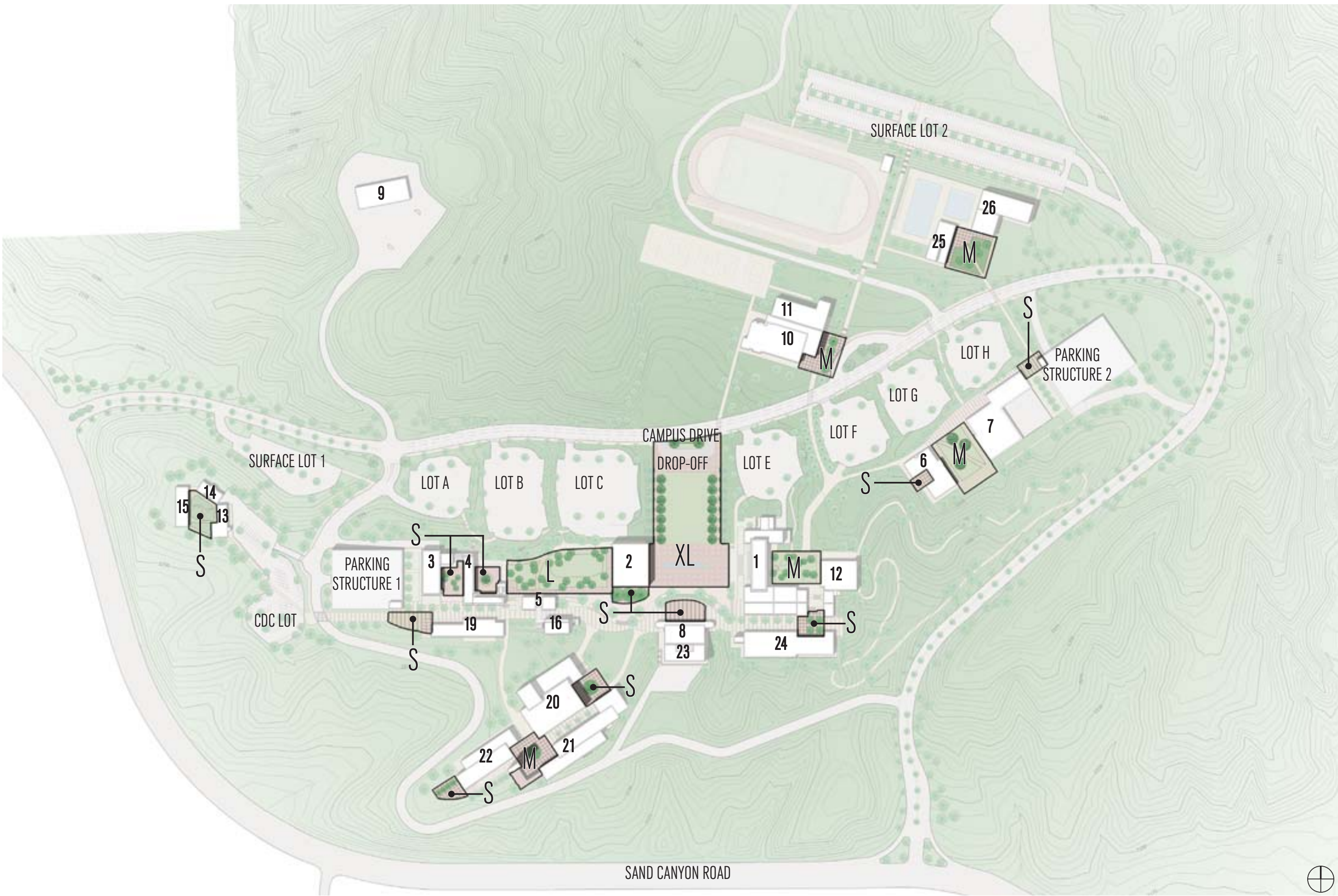
Service routes will be improved as well. The road to the Maintenance and Operations building will be widened to accommodate the projected increase in both maintenance vehicle and large delivery truck traffic. The service road to the peninsula will be widened for fire access and extended to meet the southern end of Campus Drive. In addition to improving service and fire access to the Humanities cluster and the Performing Arts Center, this service road extension will provide an alternate means of egress during emergencies.

LEGEND

- VEHICULAR
- SERVICE VEHICLE
- PEDESTRIAN
- ACCESS FROM PARKING
- CAMPUS ENTRY
- MAIN ARRIVAL POINT
- BUS STOP

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	DEMOLISHED - CLASSROOMS (former bookstore)
18	DEMOLISHED - CLASSROOMS
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

EXTERIOR SPACES



The seven existing outdoor spaces at the college will be enhanced by new landscape themes and reprogrammed to complement the clusters in which they are located. The new buildings and clusters will also contain eleven small and medium sized spaces that support adjacent programs and encourage interaction. These new and renovated spaces will be distributed throughout the campus, adding variety and enriching the outdoor environment.

The extra large space of the Entry Quad will be reconfigured to improve the entry promenade onto campus. The drop-off area will be more clearly defined, and the tree-lined walkways will lead the visitor to the center of campus. Not only will this sequence lead visitors past two of the college's signature buildings, but it will also link up to the main pedestrian spines. Large-scale campus activities such as graduation will better accommodated in this new space as well.

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
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4 | LANDSCAPE PLAN

EXISTING LANDSCAPE CHARACTER

PHYSICAL AND VISUAL CONNECTION
TO SURROUNDING HILLSIDE

LARGE FORMAL PLAZA DEFINES CAMPUS CENTER
AND ACCOMMODATES LARGE FUNCTIONS

PARK SETTING WITHIN CAMPUS CORE

COURTYARDS AS MEETING PLACES

CAMPUS DRIVE PROVIDES A GREEN BUFFER BUT NO
DIRECTIONAL CLARITY

ENTRY GATEWAYS LACK PROMINENCE

LANDSCAPE VISION, GOALS, & STRATEGIES

VISION

As Crafton Hills College expands, its campus will reinforce the overall quality of the existing landscape. The College will retain its evergreen, park-like setting and provide a beautiful hilltop place for the academic community and nearby residents to enjoy. The landscape will connect the campus to the community and the surrounding natural system.

GOALS

Create a campus landscape that reinforces the hillside experience, i.e., views, vegetation, wildlife.

Create outdoor spaces that accommodate a diversity of academic, social and community uses

Enhance driveways, campus entries and pedestrian paths for visual impact and directional clarity

Create a sustainable campus landscape

STRATEGIES

Restore the adjacent hills to a coastal sage scrub habitat

Enhance major outdoor spaces by providing regularly scheduled events combined with increased seating, shade, food amenities

Use plant material, hardscape and site furnishing to create outdoor spaces with distinct landscape identities and a "sense of place"

Redesign the Central Quad visually and physically so that it has presence as the "heart of the campus" and better functions as a graduation and gathering space

Integrate educational components into the landscape that address the natural history and ecology of the surrounding region

Introduce special features (e.g., art, water) into outdoor spaces

Revise the landscape and replace the signs at the Sand Canyon Road gateways using drought-tolerant plant palette

Develop a street tree program that enhances the entry drive streetscape

Integrate the Central Quad with the vehicular arrival area

Incorporate sustainable design approaches into the design and maintenance of the campus landscape:

- Establish a new drought-tolerant/native campus plant palette
- Increase the biodiversity of campus tree species
- Incorporate mulching, pruning and soil management into maintenance practices
- Increase use of permeable pavement
- Utilize stormwater runoff as a design element
- If possible, connect to reclaimed water system for irrigation

LANDSCAPE PLAN

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	NOT USED
18	NOT USED
19	ADMINISTRATION/STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
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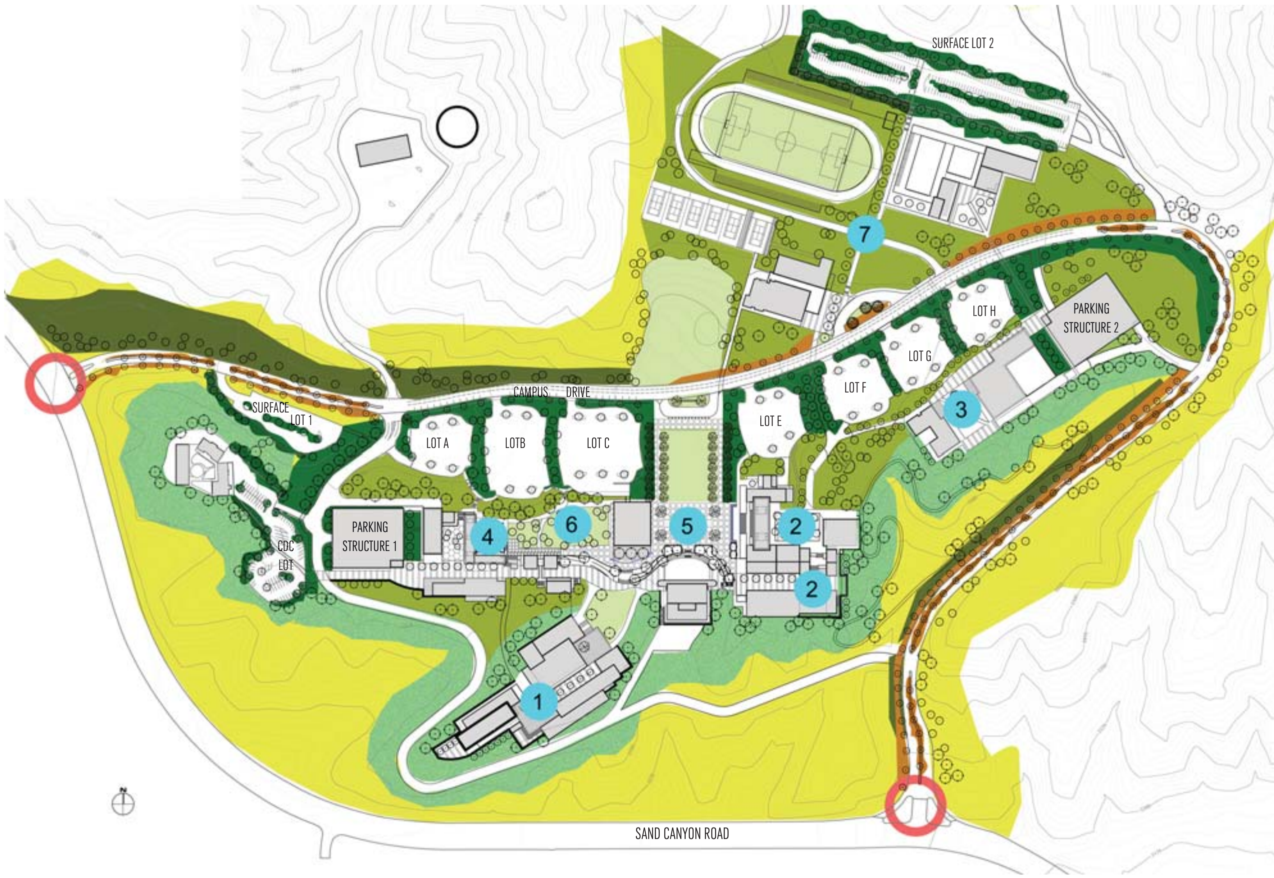
PLANTING ZONES

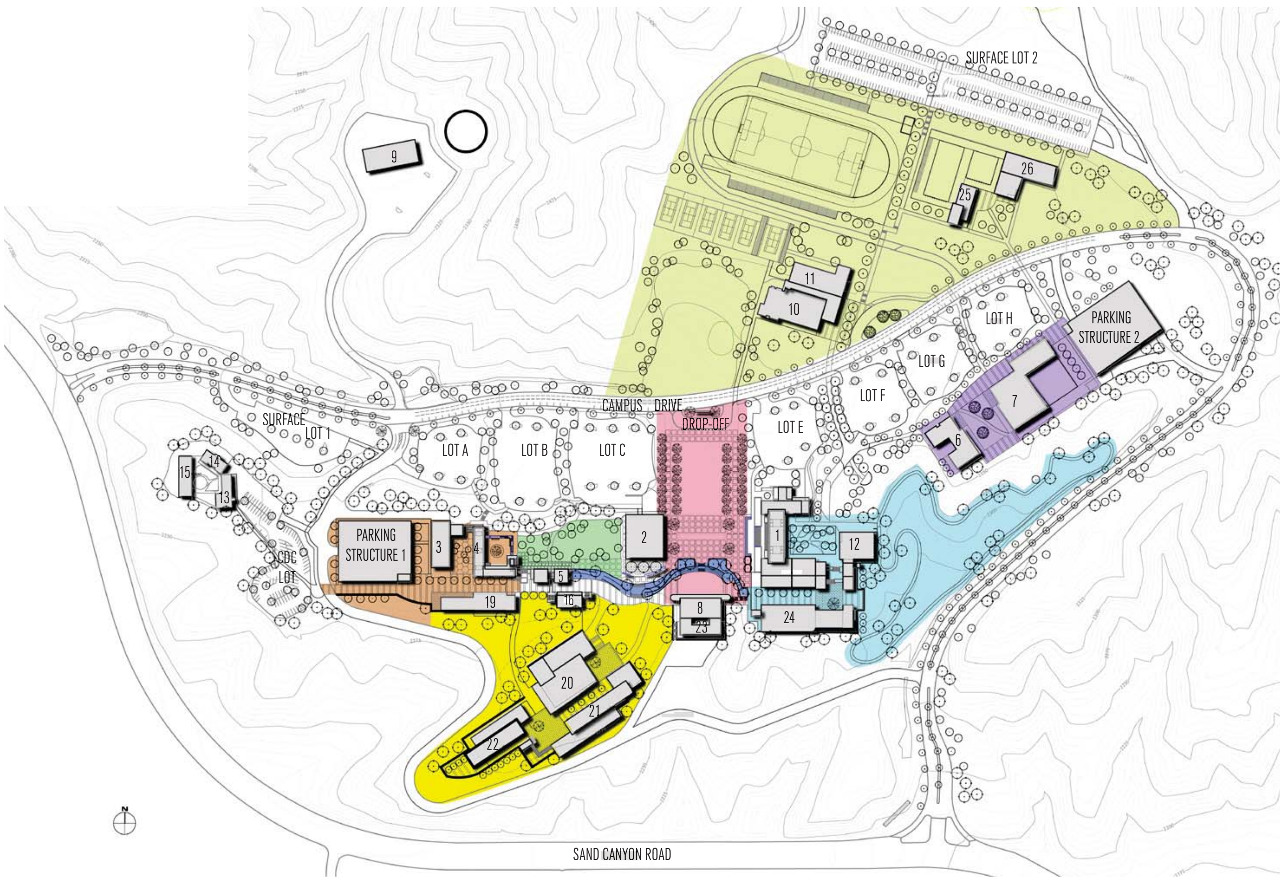


The diagram on this page shows the campus planting zones. As the zone locations move from the campus core to the natural hillsides, the design intent is to increase the use of drought tolerant plant material where possible. Over the long-term, the College can reduce its level of irrigation water needs from current campus-wide levels. Within the "fuel modification zones," the plant palette will meet the fire department's requirements for such areas.

LEGEND

- CAMPUS DRIVE
- COASTAL SAGE COMMUNITY
- FUEL MODIFICATION ZONE
- RIPARIAN CORRIDOR
- TRANSITION AREA
- PARKING LOT
- LAWN AREA
- ENTRY GATEWAY
- # CLUSTER AREA: # AS BELOW
  1 HUMANITIES
  2 SCIENCES/MATH/BIT
  3 EMERGENCY SERVICES
  4 STUDENT SERVICES
  5 CENTRAL QUAD
  6 CENTRAL LAWN
  7 COMMUNITY RECREATIONAL

MAJOR OUTDOOR SPACES



The diagram on this page identifies the major outdoor spaces in the 2025 Landscape Plan. The following outdoor spaces are described within this section:

- The Living Wall
- Central Quad
- Student Services Cluster
- Humanities Cluster
- Sciences/Math/BIT Cluster
- Emergency Services Cluster
- Community Recreational Cluster
- Central Lawn

LEGEND

- THE LIVING WALL
- CENTRAL QUAD
- STUDENT SERVICES CLUSTER
- HUMANITIES CLUSTER
- SCIENCES/MATH/BIT CLUSTER
- EMERGENCY SERVICES CLUSTER
- CENTRAL LAWN
- COMMUNITY RECREATIONAL CLUSTER

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
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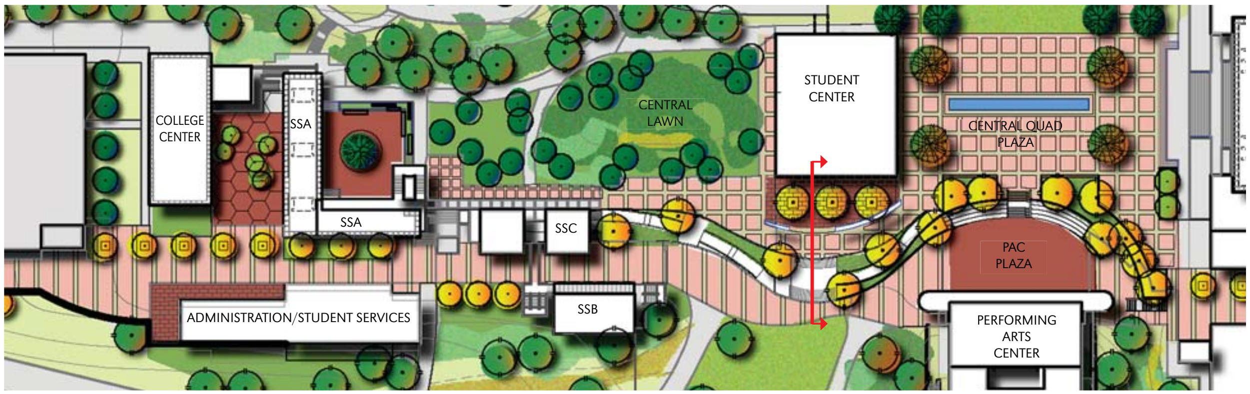
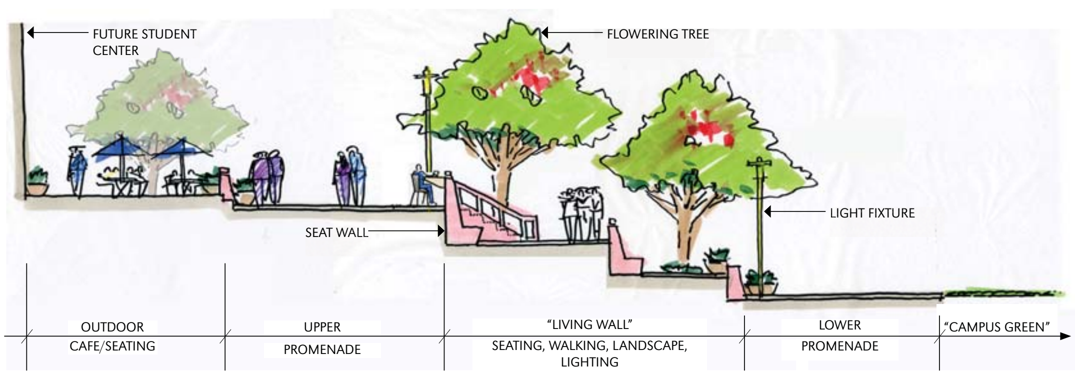
MAJOR OUTDOOR SPACES | THE LIVING WALL



PLAN VIEW

SECTION VIEW



Extending from the Student Services C building (SSC) to the Performing Arts Center (PAC) Plaza, the Living Wall serves as the transition between the upper and lower campus. Its name refers to the high level of people activity expected at this space. The Living Wall will be an architectural feature and an identity icon of the campus.

By using its series of ramps, stairs and meeting spaces, students and visitors will travel through The Living Wall on their way to the upper campus, the Performing Arts Center or the Humanities Cluster. The Living Wall will become a campus "hot spot" due to its adjacency to the Student Center outdoor cafe, the upper pedestrian spine and the lower promenade. It is a place for circulation, viewing, seating and mingling. People make the wall "living."

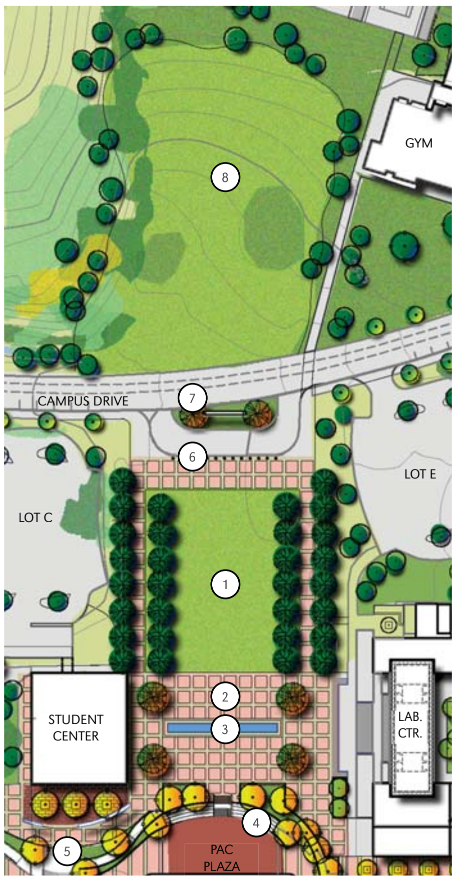
Program:

- Circulation
- Socializing
- Viewing
- Seating
- Amphitheater seating (at Performing Arts Plaza)

Elements:

- Series of ramps (8 feet wide, minimum) and stairs
- Alcove spaces give students space for viewing or to socialize away from the circulation flow
- Amphitheater seating at the perimeter of the Performing Arts Plaza for outdoor theater or campus functions
- Benches, which are part of the wall, provide seating along the circulation path
- Wide stairs allow room for students to pass, gather or sit
- Tables, built into the upper portion of the wall, allow students to study while enjoying views
- Planters contain canopy trees for shade, without blocking views to the lower campus or nearby hills
- Pedestrian lights provide nighttime illumination and pedestrian safety

MAJOR OUTDOOR SPACES | CENTRAL QUAD



PLAN VIEW

LEGEND

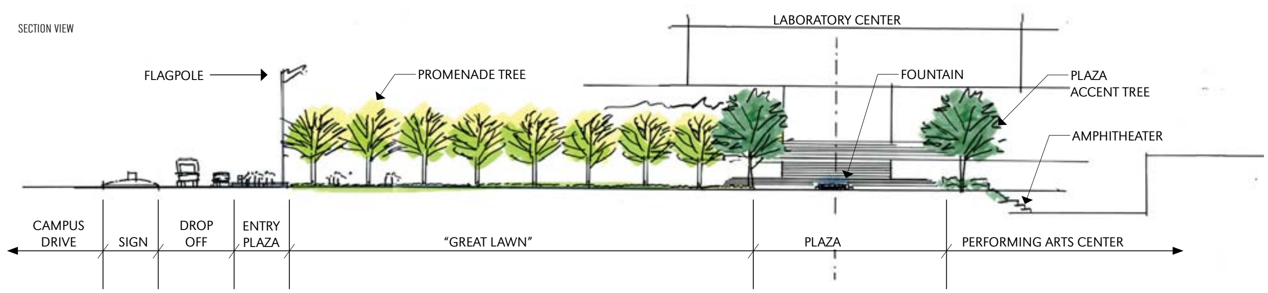
1 GREAT LAWN
2 PLAZA
3 FOUNTAIN
4 PERFORMING ARTS AMPHITHEATER & PLAZA
5 THE LIVING WALL
6 DROP-OFF & ENTRY PLAZA
7 ENTRY SIGN
8 OPEN SPACE AREA

The new Central Quad is designed to enhance its status as the "heart of the campus". The formal design of a large plaza and "great lawn" (1 & 2) contrasts against the hills to its north. The juxtaposition of the "great lawn" and the open space area (8) makes the Central Quad visible from Campus Drive, visually extends the lawn to the open space area, and connects the campus to the hills. The contrast of formal to natural, the large expanses of green, and the rows of trees establish the Central Quad as the symbolic front door of the campus.

The design and scale of the plaza area will allow large functions and events to occur within the space. A grid paving pattern will integrate the plaza with the campus' historic core. The pattern will be similar to the existing paving grid found throughout the original campus architecture. A low, linear fountain (3) visually connects the Laboratory Center and Student Center buildings, and breaks up the expanse of paving. Students can also sit along the fountain's edge. The graduation ceremony will continue to be held in the Central Quad. However, the orientation of the ceremony will occur along its north-south axis to accommodate more seating within the lawn area.

A landscaped area, part of the Living Wall, marks the southern-most perimeter of the Central Quad. From this edge, visitors can view or enter the Performing Arts Plaza. The terraced steps of an amphitheater provide circulation or seating opportunities within the Performing Arts Center.

SECTION VIEW



MAJOR OUTDOOR SPACES | CENTRAL QUAD

CRAFTON HILLS COLLEGE CENTRAL QUAD

SIERRA QUAD, CALIFORNIA STATE UNIVERSITY NORTHRIDGE

LINEAR FOUNTAIN WITH SEATING EDGE

GRADUATION SEATING ON LAWN

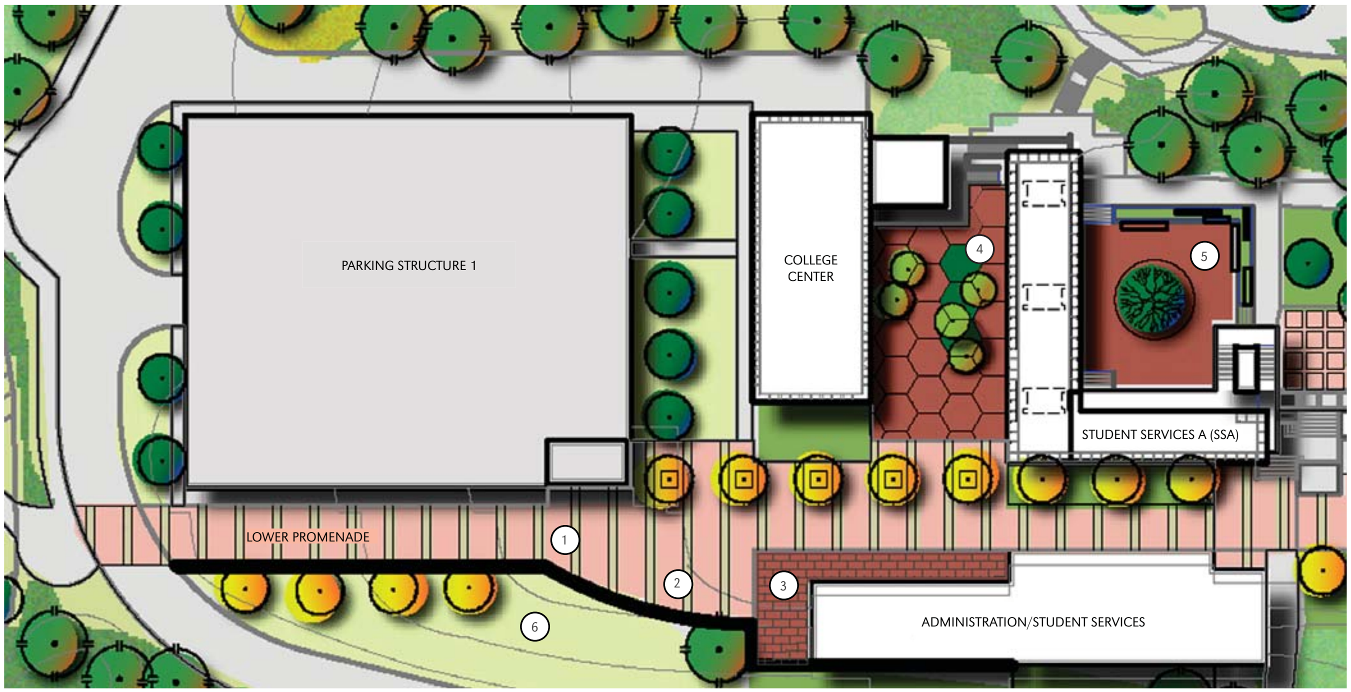
Program:

- Circulation
- Large functions (e.g., graduation ceremony, fundraising functions, student association events)
- Seating
- Passenger drop-off at entry plaza

Elements:

- Large open lawn area with wide pedestrian paths along its eastern and western perimeters
- Double rows of large evergreen trees shade pedestrian paths from drop-off area into plaza area
- Linear fountain at center of plaza
- Grid concrete paving extending from drop-off entry plaza into plaza area
- Four large accent trees at plaza corners (e.g., oak trees)
- Planting area (part of The Living Wall) separates the Central Quad plaza and the Performing Arts plaza
- Campus sign and landscape at drop-off entry island
- Entry plaza at Campus Drive edge
- Bollards and/or flag poles at entry plaza

MAJOR OUTDOOR SPACES | STUDENT SERVICES CLUSTER



PLAN VIEW

LEGEND

1 VISITORS CENTER
2 VIEW OVERLOOK
3 ADMINISTRATION FORECOURT
4 COLLEGE CENTER COURT
5 STUDENT SERVICES TERRACE
6 LANDSCAPE BUFFER

This Cluster consists of several small- and medium-sized spaces.

Visitors Center and Overlook (1 & 2)
Students and other individuals exit Parking Structure 1 and enter onto the lower campus pedestrian promenade via the Visitors Center. The space is designed to give visitors a sense of arrival. Here, they will find an information kiosk with a campus map and other bulletins about the campus. Located opposite the garage exit, they enjoy a view of the surrounding hills from an overlook. They are then directed further into campus by the enhanced paving and rows of trees along the promenade.

Administration Forecourt (3)
Enhanced paving marks the entry court of the Administration building.

College Center Court (4)
This existing courtyard, with its distinct hexagonal paving, provides the campus staff, students and visitors with a well-shaded sitting/eating area. Scheduled events can be held in this space and spillover into the promenade. The existing paving, planters and site furnishing will remain.

Student Services Terrace (5)
The thick hedges along this courtyard's northern and eastern perimeters will be replaced with terraced seating and smaller planters. The change will open up the views into this sunken area, make the space more inviting to passersby, and provide much-needed seating. The grass in the central planter will be replaced to eliminate mowing.

MAJOR OUTDOOR SPACES | STUDENT SERVICES CLUSTER


UC SAN DIEGO CAMPUS WALK


COLLEGE CENTER COURTYARD, CRAFTON HILLS COLLEGE


CAREER FAIR, SANTA BARBARA COMMUNITY COLLEGE

INFORMATION CENTER, UNIVERSITY OF VERMONT


TERRACED SEATING, CSU NORTHRIDGE


TERRACED GARDEN, PARQUE BURLE MARXX

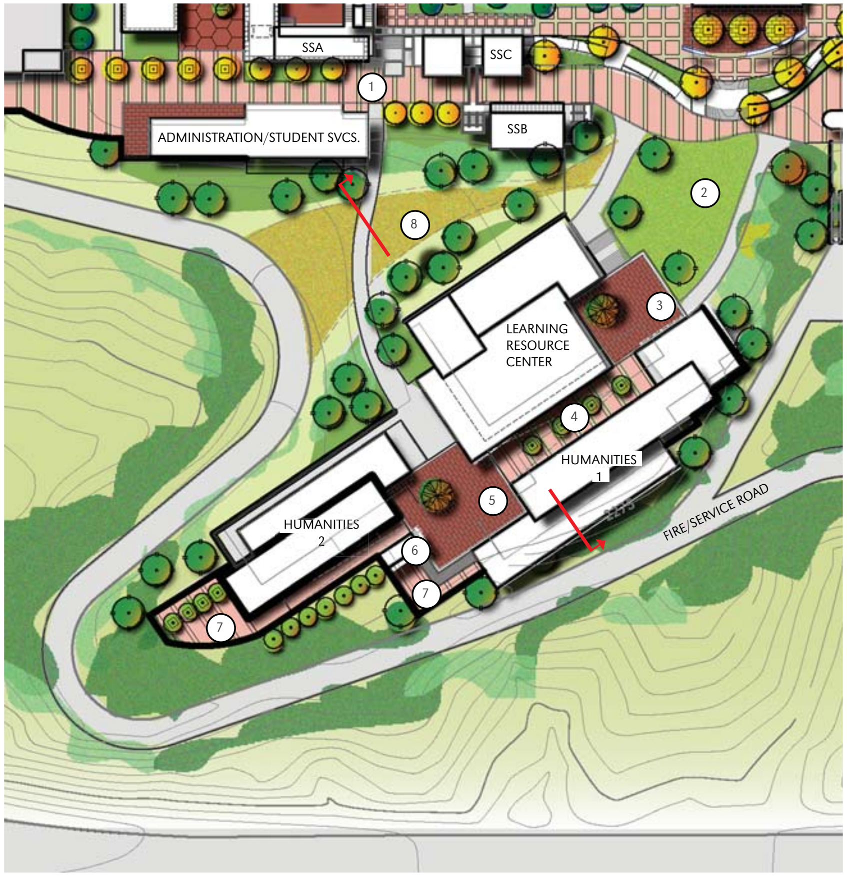
Program

- Campus entry and welcome center
- Lower promenade as pedestrian circulation and fire lane
- Flexible event spaces, e.g., fundraiser function, faculty barbecue
- Overlook area

Elements

- Information kiosk near garage exit
- Formal rows of canopy trees along promenade
- Stepped seating with new planters within Student Services Terrace
- Enhanced paving
- Site furnishing
- Pedestrian lights

MAJOR OUTDOOR SPACES | HUMANITIES CLUSTER



LEGEND

1 LOWER PROMENADE
2 LOWER CAMPUS GREEN
3 LRC PLAZA
4 HUMANITIES COURTYARD
5 HUMANITIES PLAZA
6 TOWER
7 OVERLOOK PLAZA
8 RIPARIAN RAVINE

PLAN VIEW

This group of small- and medium-sized outdoor spaces will be designed to conceptually relate to the arts. The paving, plant material and site furnishings will reflect art-inspired themes, colors and patterns. The spaces are a series of paved courtyards and passages that lead visitors down from the Learning Resource Center (LRC) to the Humanities 2 building. In keeping with the theme, art pieces and sculptures can be incorporated into the design of the sapces.

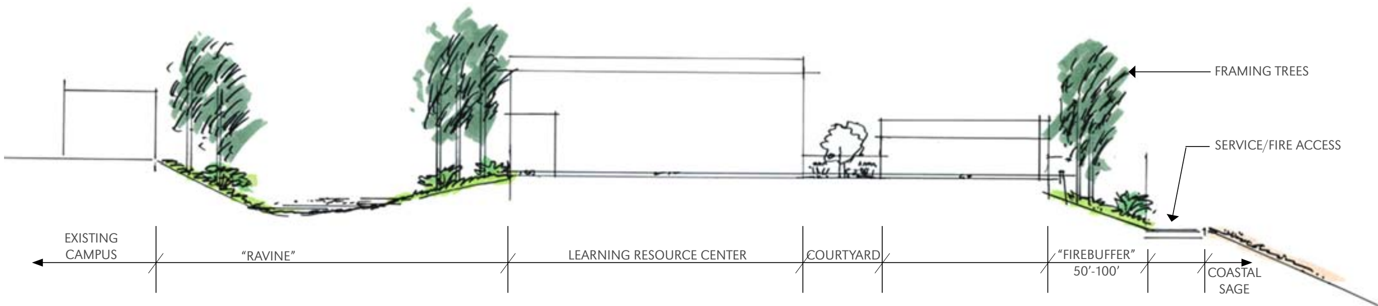
From the lower campus promenade (1), visitors reach the LRC and Humanities buildings from paths adjacent to the Administration/Student Services building or through the Lower Campus Green (2). The LRC Plaza (3) is one of two major plazas within the Humanities Cluster. While it is an entry court for the LRC and the Humanities 1 buildings, large scheduled or informal gatherings can also happen here.

Similarly, the Humanities Plaza (5) serves as building entry courts and function space. The two plazas are connected by the Humanities Courtyard (4) and by their distinct paving treatment. The Humanities Courtyard functions as an outdoor corridor within this cluster of buildings. A row of trees accentuate the linearity of the space. A tower (6), located at the plaza's southern corner, is a featured architectural element of this space.

This Cluster has two overlook areas (7). Near the tower, students step down from a very public space into a more private area that is defined by the juxtaposition of the stairs and paved area with the adjacent hillside. It is a quiet place for viewing and resting. A second overlook area is located at the Cluster's most southern tip. The space is large enough to hold small functions. Trees provide some shade and screening, but the featured element is the view.

A ravine (8) separates the Humanities Cluster from the Student Services Cluster. The ravine provides a transition from the campus landscape to the hillside. Ideas about riparian landscapes and detention basins can be incorporated into the design of the ravine.

MAJOR OUTDOOR SPACES | HUMANITIES CLUSTER



SECTION VIEW OF HUMANITIES CLUSTER

PORTION OF MONDRIAN PAINTING

UCLA SCULPTURE PLAZA

OLIVE GROVE

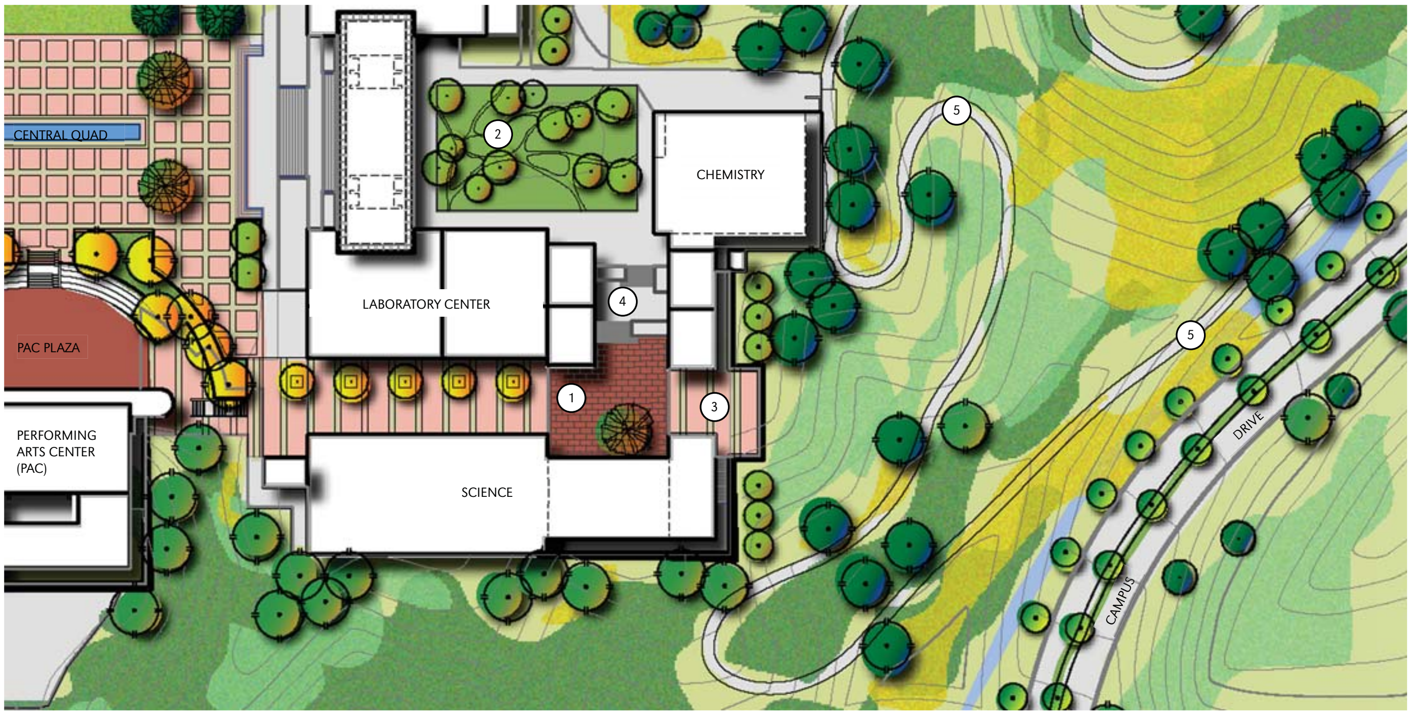
Program

- Building forecourts
- Informal socializing
- Outdoor classrooms
- Sculpture courts
- Flexible event spaces, large and small
- View overlooks
- Private study spaces

Elements

- Specimen canopy trees at two major plazas
- Mediterranean-themed planting at courtyards and plazas
- Concrete planters with seating
- Colored pavers for main plaza paving
- Colored concrete paving bands elsewhere
- Site furnishing
- Pedestrian and architectural lighting
- Planting buffers between overlooks and service road
- Riparian-themed planting at ravine

SCIENCES/MATH/BIT CLUSTER



PLAN VIEW

Similar to the Humanities Cluster, the Sciences/Math/BIT Cluster outdoor spaces will be designed to conceptually relate to the earth sciences, physical sciences, mathematics and other department studies. Ideas about ecology, technology and mathematics will be integrated into the design of the spaces. The Sciences Plaza (1) and the Display Garden (2) are its major outdoor rooms. The campus' east-west pedestrian spine terminates at the Sciences Plaza and an adjacent overlook (3). The spine is also a fire lane at this section.

The Sciences Plaza and the upper Display Garden are connected by a set of existing stairs (4). The stairs will remain a primary social node, as students continue to gather there between classes. Additional seating will be placed at the landing and within the Sciences Plaza in order to encourage student gathering.

The Sciences Plaza serves as a transition from the lower to the upper campus. It will be defined by enhanced paving and a specimen theme tree. In keeping with the science theme, the paving design will include a pattern or element reflecting scientific, mathematical or technological lessons. The plant material will relate to the ecology of the surrounding habitat.

The same design ideas are carried into the upper Display Garden. In contrast to the Sciences Plaza, the Display Garden is a green space surrounded by the existing pedestrian paths and trellis. Informal paths will lead students into the Display Garden, where they can learn about multiple tree species within the same botanical family. The garden represents a place where education occurs outside the classroom.

The Display Garden is a preview of the nature trail (5) located below the Chemistry building. The trail network provides an opportunity to learn about the local flora and fauna. Trail markers provide hikers with information about the hillside ecology. The trail can be extended campus-wide if desired.

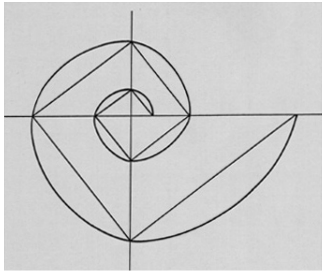
LEGEND

1 SCIENCES PLAZA
2 DISPLAY GARDEN
3 VIEW OVERLOOK
4 STAIRS
5 NATURE TRAIL

MAJOR OUTDOOR SPACES | SCIENCES/MATH/BIT CLUSTER


STAIRS WITHIN SCIENCE CLUSTER


INSERTS/ELEMENTS IN PAVING


MATHEMATICS OF THE SPIRAL

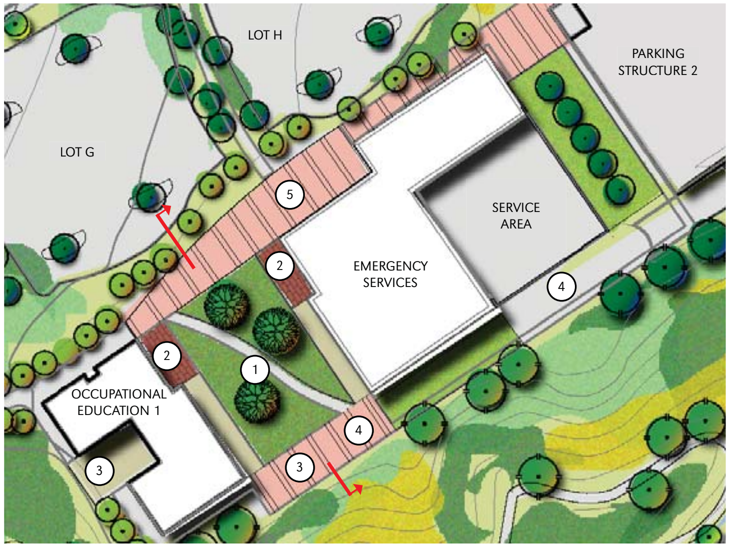

DIFFERENT SPECIES OF THE OAK TREE FAMILY


HIKERS ALONG TRAIL

Program
- Informal gathering between classes
- Entry forecourts
- Ecological display garden
- Outdoor classroom
- Pedestrian circulation
- Fire lane
- Hillside viewing
- Hiking

Elements
- Enhance paving at Sciences Plaza
- Colored concrete bands along pedestrian spine
- Specimen tree at Sciences Plaza
- Multiple tree species and other planting within the Display Garden
- Planters with plant material and seating edge
- New trail path and landscape
- Site furnishing
- Lighting

MAJOR OUTDOOR SPACES | EMERGENCY SERVICES CLUSTER

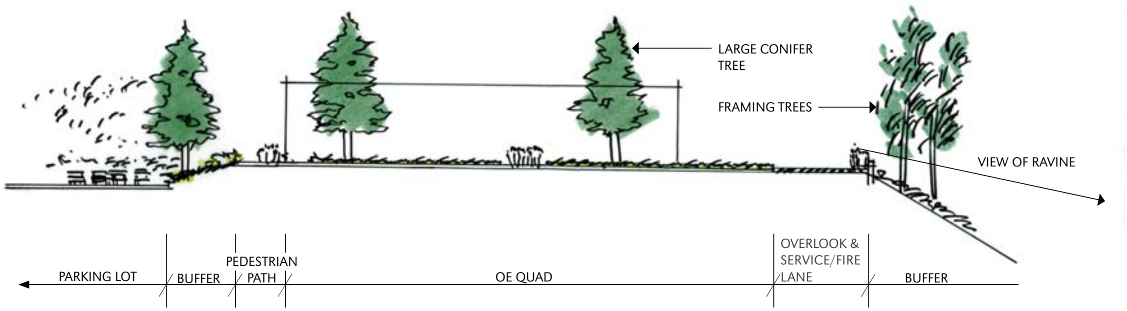


PLAN VIEW

LEGEND

1 OE QUAD
2 BUILDING ENTRY COURT
3 OVERLOOK
4 FIRE LANE
5 WALKWAY

SECTION VIEW



Located between the campus core and Parking Structure 2, visitors reach the Emergency Services Cluster along a main path extending from the garage to the Cluster's west perimeter. The OE Quad (1) is a large lawn area that connects the Occupational Education and the Emergency Services buildings. Students and faculty will enter each building through small entry courts (2) located near the main walkway.

The design for the OE Quad will express concepts of heroism and courage. Large conifer trees will stand out in an expanse of lawn. The trees' size at maturity symbolizes "bravery" or "courage". People move through paths within and around the lawn. The paths and building entry courts will be designed as "walks of heroes" using enhanced paving, patterns and the placement of objects/words along the paths. Over time, other memorial objects can be introduced as part of a College Donor Program.

At the Cluster's southern and western perimeters, visitors can enjoy the scenic overlooks provided (3). People reach these overlooks along pedestrian paths at the hillside perimeters. A fire/service lane (4) is incorporated into the southern-most overlook and a section of the Quad lawn. An area of the lawn will be made of a reinforced grass paving system to provide a turnaround area for fire trucks and a training/exercise area for the Emergency Services students.

MAJOR OUTDOOR SPACES | EMERGENCY SERVICES CLUSTER

TANNER FOUNTAIN AT HARVARD UNIVERSITY

ENGRAVED WORDS IN ROCKS

DONOR PAVERS

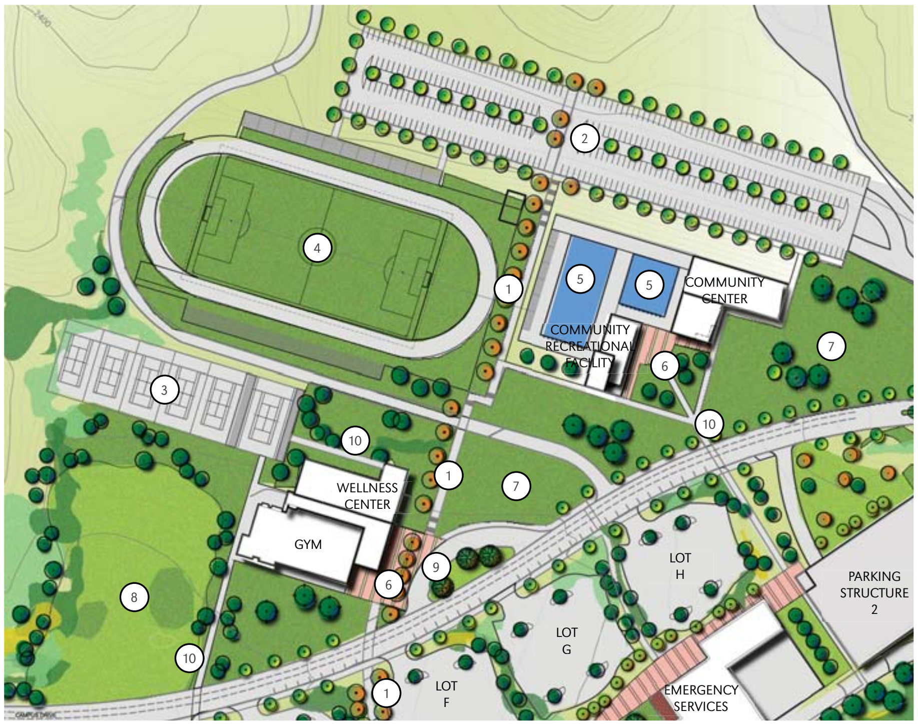
LARGE CONIFER TREE

MEMORIAL MARKER WITH ENGRAVINGS

Program
- Building entries
- Informal gathering spaces
- Emergency service exercises
- Small and large function spaces

Elements
- Specimen conifer trees
- Lawn area
- Colored pavers
- Colored concrete paving bands
- Reinforced grass paving system
- Planters with plant material
- Heroes marker/monument

MAJOR OUTDOOR SPACES | COMMUNITY RECREATIONAL CLUSTER



LEGEND

1 PEDESTRIAN WALKWAY
2 SURFACE PARKING LOT 2
3 TENNIS COURTS
4 TRACK & FIELD
5 POOLS
6 BUILDING ENTRY COURTYARDS
7 SURROUNDING LANDSCAPE
8 OPEN SPACE AREA
9 DROP-OFF AREA
10 SECONDARY WALKWAYS

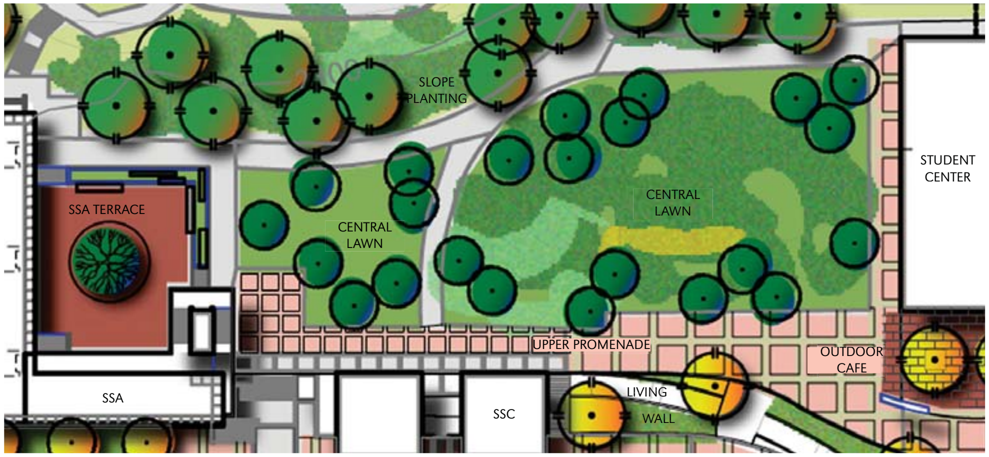
A tree-lined pedestrian walkway (1) connects the main campus to the Community Recreational Cluster and its new surface parking lot (2). The new facilities will replace the area currently occupied by a golf course. New tennis courts (3), track & field (4) and pools (5) will enhance the existing athletic program and provide opportunities for on-campus community activities.

The new community buildings, Wellness Center and gymnasium will have courtyards (6) that serve not only as building entries, but also as places for groups or teams to gather before/after competitions, classes or events. The surrounding landscape (7) immediately adjacent to Campus Drive will have an informal character that expresses the quality of the adjacent hillsides. An open space area (8), just west of the gymnasium, will be an extension of the great lawn of the Central Quad (as discussed in an earlier section).

A drop-off area (9) is conveniently located adjacent to the gymnasium. From here, people can move easily from one facility to the next. Secondary and tertiary paths (10) will also connect pedestrians to the Central Quad and other parts of campus, as well as parking along Campus Drive and Parking Structure 2.

Program
- Athletic events & classes
- Community events
- Building forecourts
- Passenger drop-off areas
- Parking

Elements
- Large lawn and groundcover areas with diverse tree species
- Accent tree along main pedestrian connector
- Landscape planters at parking lot
- Landscape planters at building entries
- Tennis courts
- Track & field facility with bleachers
- Golf putting greens(at portion of open space area)
- Colored concrete paving
- Concrete pedestrian pathways
- Site furnishing
- Pedestrian and architectural lighting



PLAN VIEW

VIEW OF STUDENT SERVICES BUILDING FROM CENTRAL LAWN

The existing Central Lawn is located between the SSA and Student Center buildings. The Central Lawn has a simple, informal design of London Plane trees planted in an expanse of turf grass bisected by a walkway. The space will continue to function as a place for circulation, shade, and outdoor classes. Damaged turf grass and other plant material will be replaced as necessary. Existing shade, soil and pedestrian traffic conditions may be reasons for the areas of damage. Replacement plants will be selected as appropriate for the condition without changing the original character of the space. In addition, the replacement or treatment of existing trees will be handled in accordance with the recommendations made by the campus arborist*.

Program

- Shade
- Seating
- Informal gathering
- Circulation

Elements

- Trees, turf and shrubs (existing plant material to remain except as noted above)
- Concrete pedestrian walkways
- Site furniture
- Pedestrian lights

* See Consulting Arborist's Report, "Tree Management & Preservation Study," by Greg Applegate, 2005.

5 | ACKNOWLEDGEMENTS

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Virginia Moran, Director of Research and Planning
Daniel Bahner, Academic Senate President
Ted Phillips, Coordinator of Technology Services
Carlos Maldonado, Student Success Technician
Eric Jorgensen, Student
Edward Villa, Student

SAN BERNARDINO COMMUNITY COLLEGE DISTRICT
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Laurens Thurman, Interim Executive Director of Facilities

PILOT ENGINEERING
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Jim Holbrook, Chair, Emergency Services
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Ralph Rabago, Chair, Health & Physical Education
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TECHNOLOGY SERVICES

Wayne Bogh, Enterprise Network Specialist
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Englekirk Partners Consulting Structural Engineers – Structural

IBE Consulting Engineers – Mechanical, Electrical, Plumbing

Snipes-Dye Associates – Civil Engineer

Ah'be Landscape Architects – Landscape

Davis Langdon – Cost

Shen, Milsom & Wilke / Paoletti – Security

Vantage Technology Consulting Group – Technology

Aquatic Design Group, Inc – Pool

Kaku Associates, Inc. – Traffic

Davies Associates – Signage

Art Zendarski - Architectural Illustrator

CREDITS

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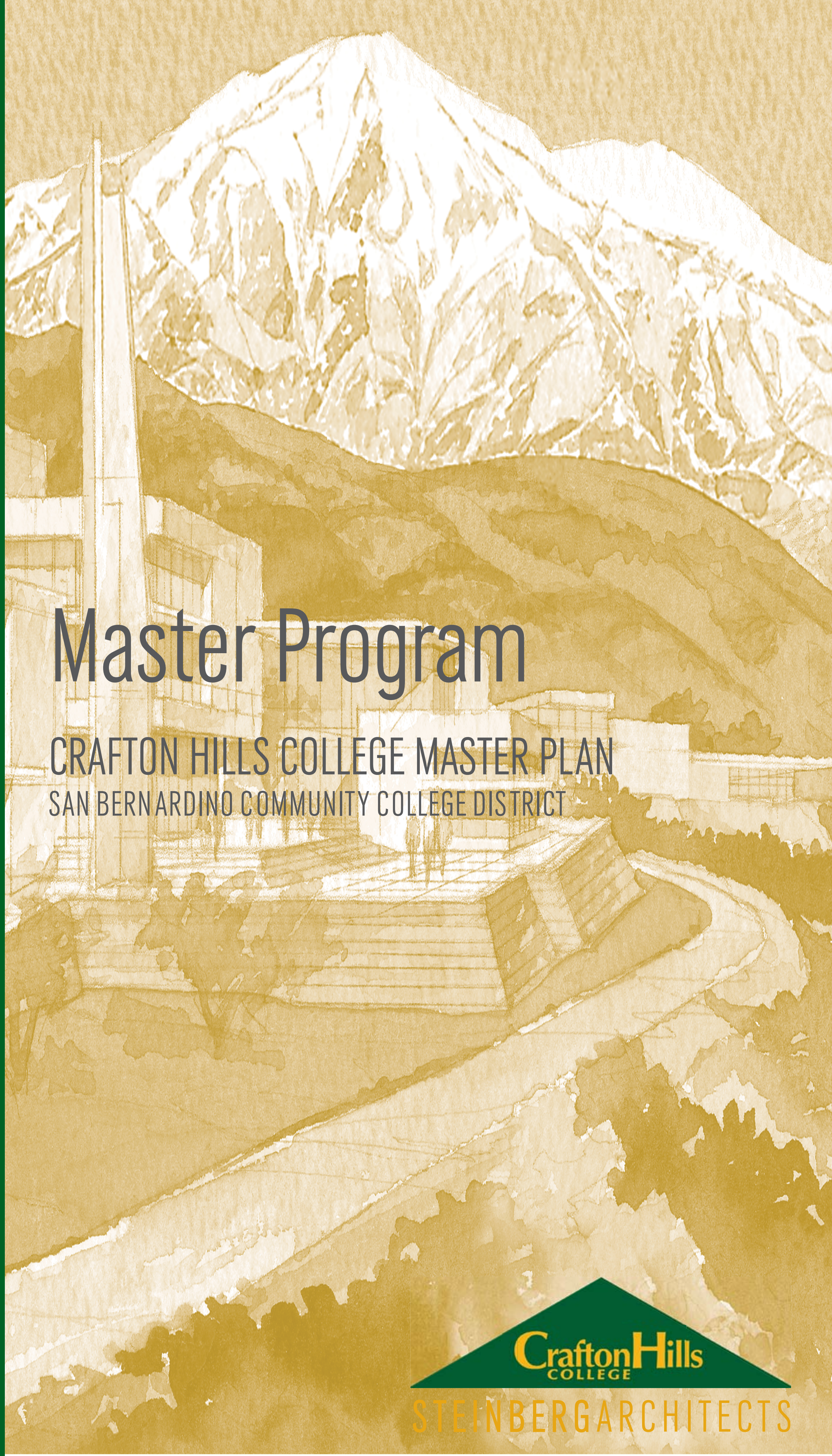
ENDNOTES

1 Cygelman, Adele. *Palm Springs Modern*. New York: Rizzoli International Publications, Inc. 1999. p. 94.

2 Hess, Alan and Andrew Danish. *Palm Springs Weekend: The Architecture and Design of a Midcentury Oasis*. San Francisco: Chronicle Books. 2001. pp. 78-80.

3 Cygelman, Adele. *Palm Springs Modern*. New York: Rizzoli International Publications, Inc. 1999. p. 94.



Volume 2 Master Program

CRAFTON HILLS COLLEGE MASTER PLAN

SAN BERNARDINO COMMUNITY COLLEGE DISTRICT

Crafton Hills College

STEINBERG ARCHITECTS

Volume 1 Master Plan

Volume 2 **Master Program**

Volume 3 Existing Facilities Assessment

Volume 4 Phasing, Guidelines, & Infrastructure

1 | SUMMARY

OVERVIEW

Crafton Hills College is one of two colleges in the San Bernardino Community College District, the other being San Bernardino Valley College in San Bernardino. San Bernardino and Riverside Counties comprise what is commonly known as the "Inland Empire", which is one of the fastest growing metropolitan regions in the nation. Based on demographic trends, Crafton Hills College is expected to grow from 5,400 students to 7,150 students by the year 2012 and ultimately expand to 11,470 students by 2025. The target of 7,150 students is critical to reach because this is traditionally the threshold of students that can support a comprehensive course offering and curriculum (which is not currently available), and in turn will provide CHC with the resources to retain its students. The years 2012 and 2025 are used as guidelines and can slide further into the future. The focus is on achieving the enrollment numbers and not necessarily meeting the dates.

It is essential to first understand how CHC operates before recommending where and how their facilities should grow. All of the existing spaces on campus were analyzed to confirm their use by room type and department. Room schedules were consulted for the lecture and lab spaces on campus to determine their utilization, i.e., how often classes were being taught. Meetings were held with the academic departments to understand their existing needs and issues.

The overall growth of the campus is based on the projections of the Educational & Facilities Master Plan (October 2000) and its Update (March 2005) – see appendix. The plan identifies how academic disciplines will grow based on demographic and economic forecasts and educational trends for the college. This information was synthesized to determine which programs are growing the most, triggering a need for more space, and to identify the amount of overall growth to the campus. Currently, the campus is overbuilt and underutilized, per State standards. There is too much lecture and office space than the 5,400 students can justify and not enough hours per week are being taught in the classrooms.

Combining the information learned from the space utilization study of the campus with the projected space needs and keeping in mind the Master Plan goals, a Master Program Plan was developed that outlines how growth will be accommodated through the renovation, addition and construction of new buildings on campus. Related departments will be grouped together by cluster to consolidate programs that are currently spread out over campus. Each academic cluster will have facilities such as a departmental library, an instructional media room, and technical support to create "hot spots." The departmental grouping of each cluster is based on the types of spaces needed by each cluster, its projected growth, and desired and functional adjacencies.

In order to provide a minimum standard of performance and an equitable teaching environment, standards for lectures, labs, offices and conference rooms were created. These set a standard for the sizes of new spaces on campus and will serve as a guideline for the renovation and new construction.

The following documents were consulted while developing the Master Program Plan:

Educational & Facilites Master Plan – Crafton Hills College, October 2000, Maas Companies
Educational & Facilities Master Plan Update – Crafton Hills College, March 2005, Maas Companies
Space Inventory Report – Report 17, March 2005, San Bernardino Community College District
Learning Resource/Technology Center Final Project Report, February 2005, Maas Companies
Crafton Hills College Room Schedule – Lecture, Fall 2005, Crafton Hills College
Crafton Hills College Room Schedule – Labs, Spring 2005, Crafton Hills College

Space Utilization | 2

2 | SPACE UTILIZATION

SUMMARY

To understand how Crafton Hills College functions, a determination must be made for how each room is used. The Space Inventory Report – Report 17 (a listing of the existing rooms on campus) was studied and updated with information gained from on campus walk-throughs and through meetings with the users. Approximately 3,910 ASF was removed from the Space Inventory because it did not qualify as assignable square footage (ASF).

The Space Inventory groups the existing spaces by building and identifies their room type (office, lecture, lab, etc.) and use (Taxonomy of Programs – TOPs code). The same data were rearranged by department to create a Space Use matrix that illustrates how much and what type of space each department uses. Floor plans of the existing buildings were color coded to reflect the departmental usage. The resulting plans showed that the majority of the departments are spread out over the campus. Those that are most spread out from one another are Fine Arts, Humanities (including Language Arts and Social Sciences), Business & Information Technology, Student Services and the Police Department. Departmental separation leads to academic and spatial inefficiencies. All of the departments on campus would ideally like to be consolidated and co-located.

The majority of the buildings on campus are constructed of concrete. This construction type limits both the flexibility to reconfigure internal spaces and the adaptability to new technologies within the spaces. The interior of the majority of the buildings appear to be run down and in need of new finishes to improve the overall atmosphere for the students, faculty and staff.

Meetings with the Instructional and Student Services Councils as well as with various campus departments resulted in a list of common campus-wide needs, issues and facts.

GENERAL NEEDS

1. Medium-sized classrooms for 40-55 students – Of the 29 classrooms on campus, 8 are extra-small (35 seats or less), 5 are small (36-45 speats), 10 are medium (46-55 seats) and 6 are large (55 or more). The small classrooms are too small to be used by most classes except for Language Arts, thereby limiting their flexibility. As with most colleges, the most popular class time is in the morning. In the mid-afternoons, classrooms are typically empty until the evening sessions begin. Few classes are taught on Fridays. The demand for medium-sized classrooms has as much to do with the space as it does with the utilization. Increasing how often the existing medium lecture rooms are used will alleviate some of the need until the student population requires more rooms. Currently most classrooms are heavily scheduled between 11 am and 1 pm.

2. Large-sized classrooms for 100-120 students – After the four largest classrooms in Lab/Admin and Chemistry Buildings that seat approximately 65 students, the next largest classroom on campus is the auditorium in the Performing Arts Center which seats 400. There is a need for two classrooms of approximately 1,500 ASF that can be used by the larger classes on campus.

3. Assembly Space for 120-200 students – There is a need on campus for one extra-large lecture/assembly space of approximately 2,500 ASF that can be used for instructional purposes, informal performances, and community events, such as guest speakers, which do not require the seating capacity of the PAC auditorium.

4. Electrical Upgrades Campus Wide – "Blowing fuses" is a common problem campus-wide. Faculty and staff noted the inability to operate multiple electrical devices at one time; an added difficulty is that since the faculty do not have access to electrical rooms, maintenance must be called to fix the problem each time it occurs.

5. Part-time Faculty Offices – There are no dedicated part-time faculty offices on campus. CHC needs shared office space for part-time faculty.

6. Faculty Offices – Space will need to be provided for new faculty as programs grow. It is desirable to have faculty offices located closer to where they actually teach to encourage interaction with the students. The majority of the faculty offices are located on the third floor of the Student Services building (SSA).

7. Administration Offices – A new middle management level will be introduced as part of Administration and will need to have offices. It is expected that five (5) new associate dean positions will be added. Developmental Education and Institutional Advancement will also be adding new positions that will also require offices. Institutional advancement can be located off campus.

8. Storage – Short-term and long-term storage is a need for most people on campus, particularly those in Student Services, Administration, Health & Wellness and Emergency Services. The main storage area at the Maintenance building, which houses the Shipping and Receiving departments, is not secure and often open to the elements. This poses a large problem particularly when large shipments of computer equipment or books arrive on campus and need to be stored until they can be distributed to their final locations.

9. Reading Center, Writing Center and Mathematics Center – The faculty prefers that these services be located with the departments that they support rather than with the Learning Center.

10. Exterior Seating – There is not enough exterior seating provided on campus, particularly in the shaded areas.

11. Master Clock System – There is no master clock system on campus. A master clock system would help improve starting and ending classes on time and managing the time to transfer between classes. The utilization of such a system would synchronize all classroom clocks.

12. Parking – There is a perceived lack of available parking spaces on campus during the peak periods of the day, 10 am – 1 pm. It is during this time that the campus is the most crowded.

GENERAL ISSUES

1. Bookstore Location – The location of the Bookstore should be central to the campus rather than at the far east end. Despite vending machines that offer office supplies throughout campus, the college believes that more students would use it if the Bookstore were centrally located.

2. Cafeteria Location – The location of the Cafeteria should be central to the campus rather than at the far west end. Vending machines are located throughout campus that serve the students when the Cafeteria is closed. CHC has expressed a desire to have the "enterprise" or money-making activities co-located to better support and enhance one another.

3. Campus Accessibility – The campus accessibility needs to be improved to meet current codes. There is a concern that disabled students do not come to CHC because of the difficulty in navigating the campus.

GENERAL FACTS

1. Classrooms are too small and dark – In general, the teaching spaces on campus have few windows creating dark environments that are not attractive to students. As mentioned previously, many of the classrooms are too small to be used by classes with a capacity of 40 or more, and this limits the scheduling flexibility for the rooms.

2. Classroom furniture is mismatched – There are few rooms on campus that have matching furniture and many pieces are in need of repair. The lack of uniformity of furniture leads to an unattractive learning environment and can cause a bad "first impression" on students.

3. Seven (7) "Smart" classrooms on campus – CHC has converted seven of its existing classrooms on campus to "Smart" classrooms. The small "Smart" classrooms (BC106, CL 218, and CL 107) have wall-mounted equipment, a ceiling mounted projector, and no lectern. The medium/large "Smart" classrooms (BC101, CHS 237, LADM 224, and CHS 242) have a lectern with computer, DVD, front/back switching, a pull-down or motorized screen, and a ceiling mounted projector.

EXISTING BUILDING ASF/GSF SUMMARY

Building		Report 17 ASF*	Revised ASF	GSF
01	Lab/Admin	25,784	24,042	30,621
02	Library	26,042	25,299	36,900
03	Student Center	8,245	8,398	8,560
04	Student Services	4,773	4,783	9,970
05	Classroom Building	5,816	5,714	6,800
06	Occupational Ed 1 (OE1)	7,719	7,602	9,842
07	Occupational Ed 2 (OE 2)	12,385	12,302	15,730
08	Performing Arts Center (PAC)	15,736	16,495	29,851
09	Maintenance	5,827	5,827	6,400
10	Gymnasium	22,428	20,764	27,250
12	Chemistry/Health Science	12,776	12,883	17,238
13	Child Development 1	3,083	3,220	4,900
14	Child Development 2	1,746	1,906	3,150
15	Child Development 3	886	886	960
16	Student Services B	4,194	3,991	5,575
17	Bookstore (BK)	4,647	4,791	5,760
18	Classrooms at Bookstore (BC)	3,794	4,072	4,320
35	Building O	864	897	960
	CAMPUS TOTAL	**166,745**	**163,872**	**224,787**

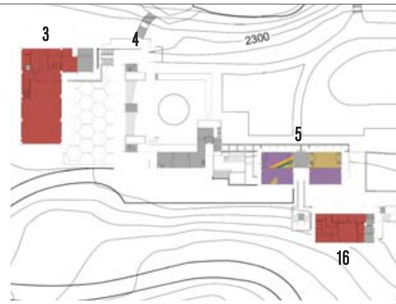
*Existing per Report 17 (March 2005)

GSF - Gross Square Feet: Usually refers to gross area of a building by measuring from the outside of its exterior walls and including all vertical penetrations such as elevator shafts. Also includes basement space

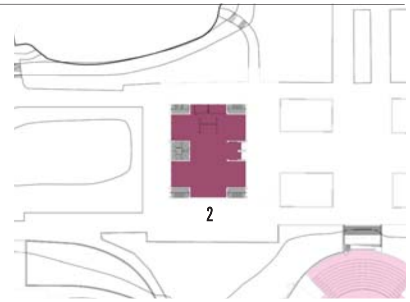
ASF - Assignable Square Feet: Amount of space that can be used for programs within interior walls of a room. Major room use categories typically include classrooms, laboratories, offices, study areas, special use space, general use areas, support rooms, health care, residential, and unclassified space.

EXISTING DEPARTMENT LOCATIONS - FIRST LEVEL

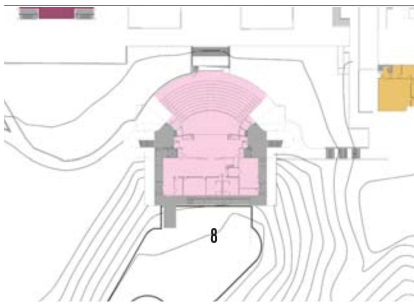
FUTURE CHILD DEVELOPMENT & EDUCATION CLUSTER



FUTURE STUDENT SERVICES CLUSTER



FUTURE STUDENT CENTER CLUSTER



FUTURE FINE ARTS CLUSTER

FUTURE SCIENCES/ MATH/ BIT CLUSTER

FUTURE EMERGENCY SERVICES CLUSTER

FUTURE HEALTH/ PHYSICAL EDUCATION CLUSTER

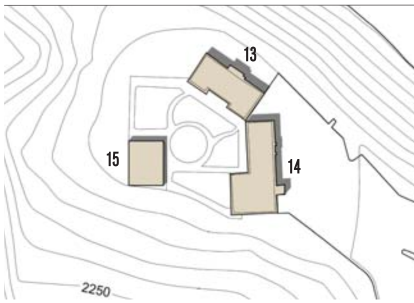
FUTURE MAINTENANCE & OPERATIONS CLUSTER

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

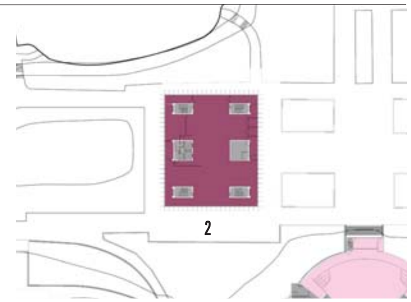
NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

EXISTING DEPARTMENT LOCATIONS - SECOND LEVEL

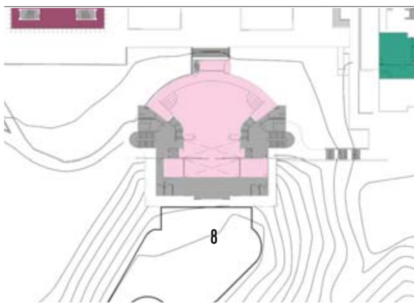


FUTURE CHILD DEVELOPMENT & EDUCATION CLUSTER

FUTURE STUDENT SERVICES CLUSTER

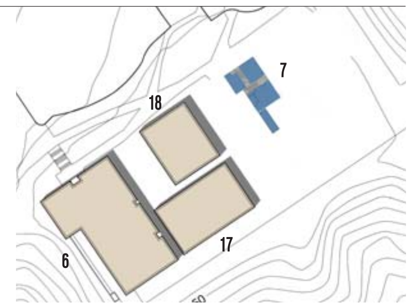


FUTURE STUDENT CENTER CLUSTER

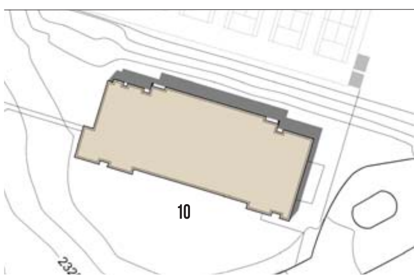


FUTURE FINE ARTS CLUSTER

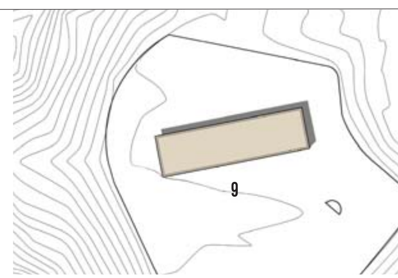
FUTURE SCIENCES/ MATH/ BIT CLUSTER



FUTURE EMERGENCY SERVICES CLUSTER



FUTURE HEALTH/ PHYSICAL EDUCATION CLUSTER



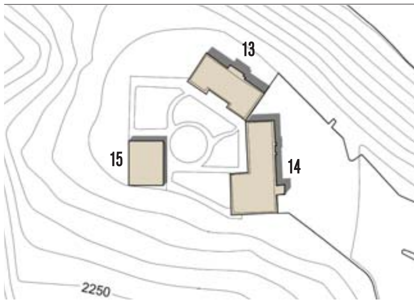
FUTURE MAINTENANCE & OPERATIONS CLUSTER

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

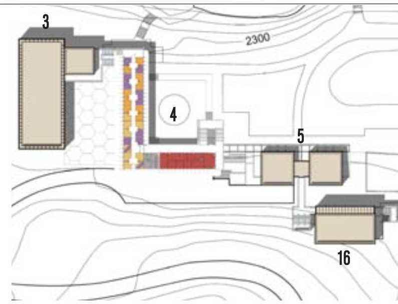
- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

EXISTING DEPARTMENT LOCATIONS – THIRD LEVEL

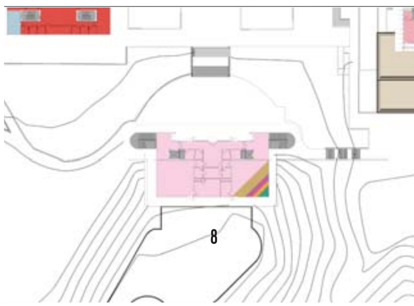


FUTURE CHILD DEVELOPMENT & EDUCATION CLUSTER

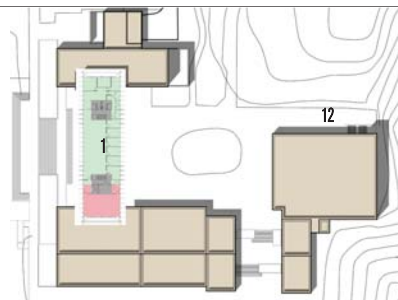


FUTURE STUDENT SERVICES CLUSTER

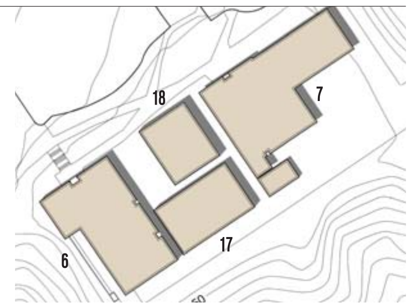
FUTURE STUDENT CENTER CLUSTER



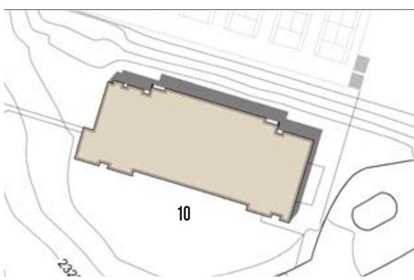
FUTURE FINE ARTS CLUSTER



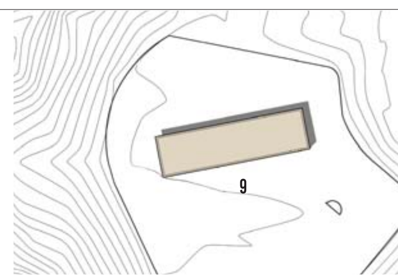
FUTURE SCIENCES/ MATH/ BIT CLUSTER



FUTURE EMERGENCY SERVICES CLUSTER



FUTURE HEALTH/ PHYSICAL EDUCATION CLUSTER

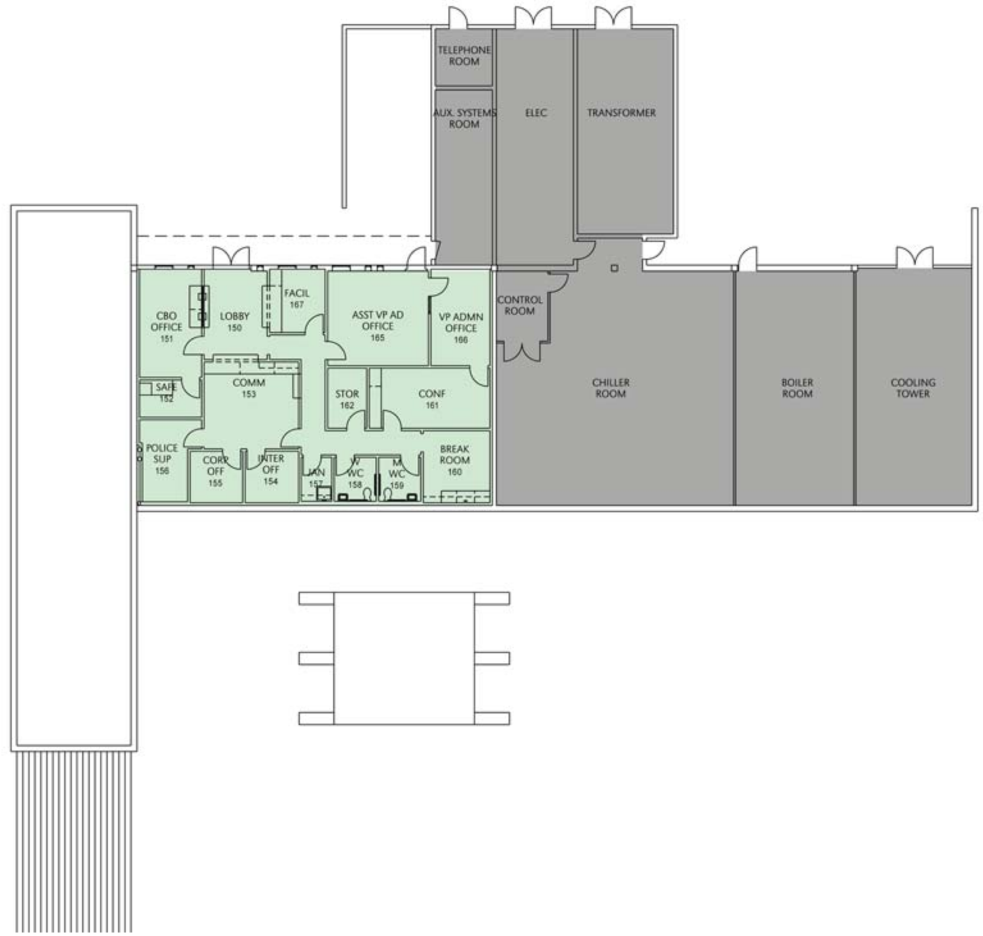


FUTURE MAINTENANCE & OPERATIONS CLUSTER

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE



1 LABORATORY/ ADMINISTRATION
FIRST LEVEL - NORTH

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

1 LABORATORY/ ADMINISTRATION
FIRST LEVEL - SOUTH

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

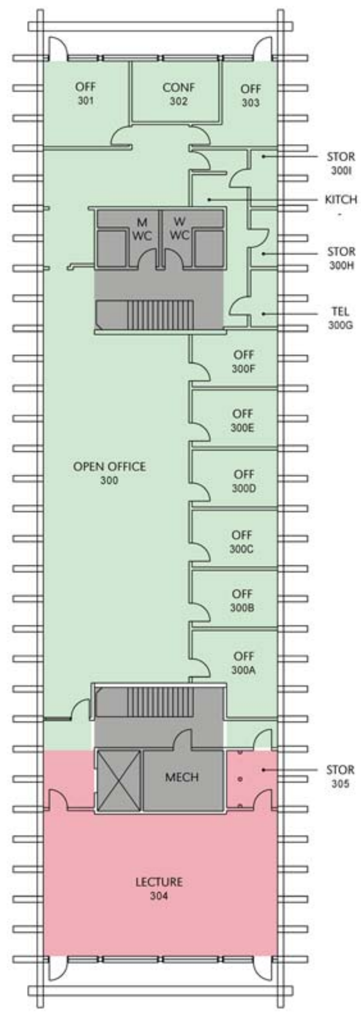
1 LABORATORY/ ADMINISTRATION
SECOND LEVEL - NORTH

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

1 LABORATORY/ ADMINISTRATION
SECOND LEVEL - SOUTH

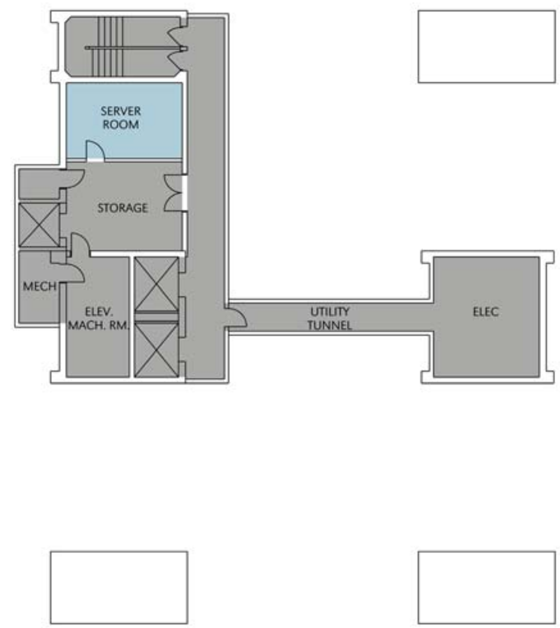


1 LABORATORY/ ADMINISTRATION
THIRD LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

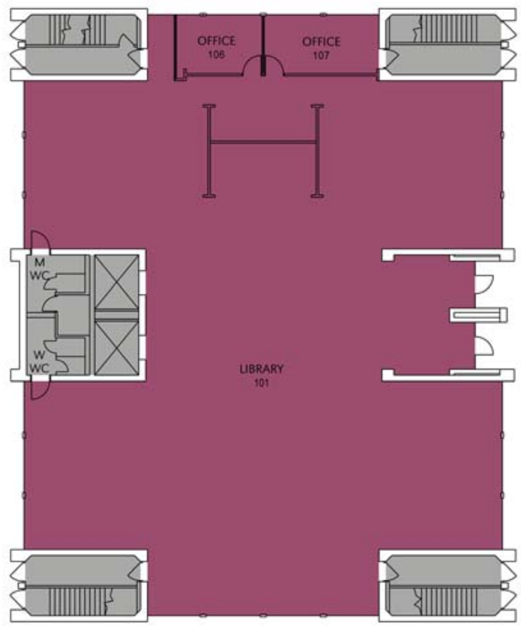


2 LIBRARY/ LEARNING RESOURCES
BASEMENT LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

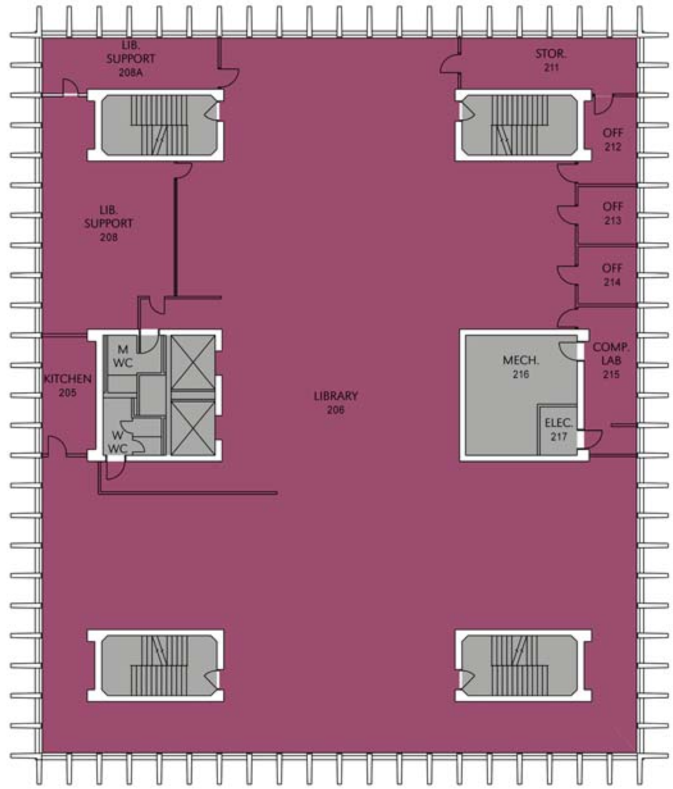


2 LIBRARY/ LEARNING RESOURCES
FIRST LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

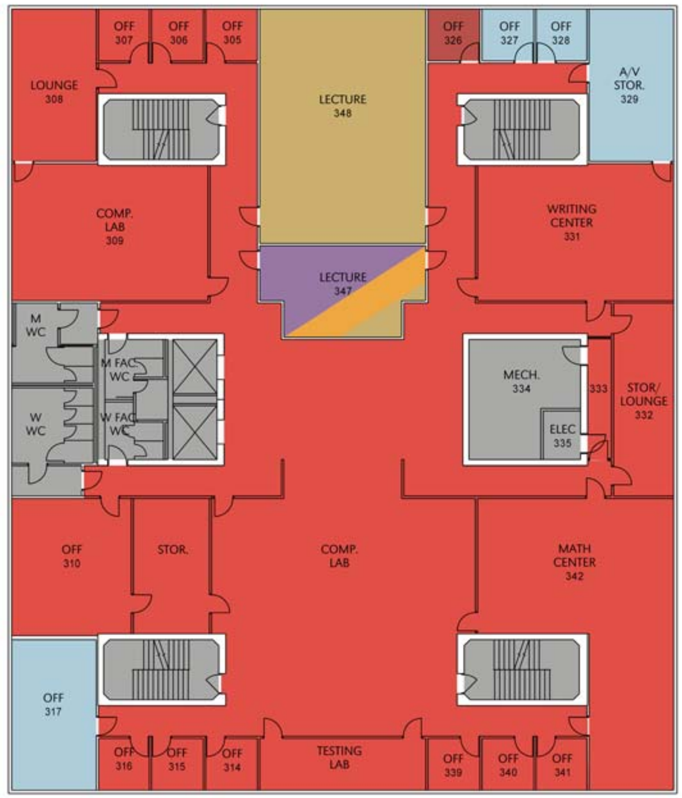


2 LIBRARY/ LEARNING RESOURCES
SECOND LEVEL

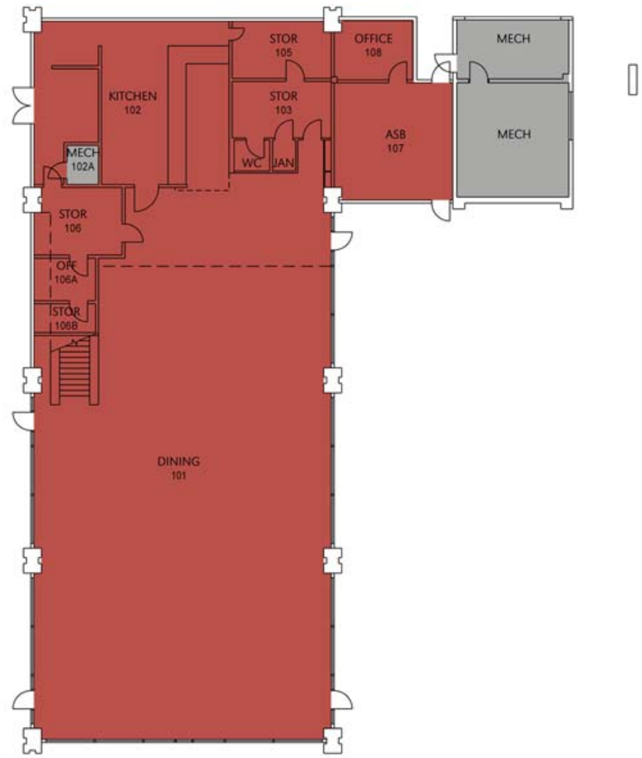
DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'



2 LIBRARY/ LEARNING RESOURCES
THIRD LEVEL

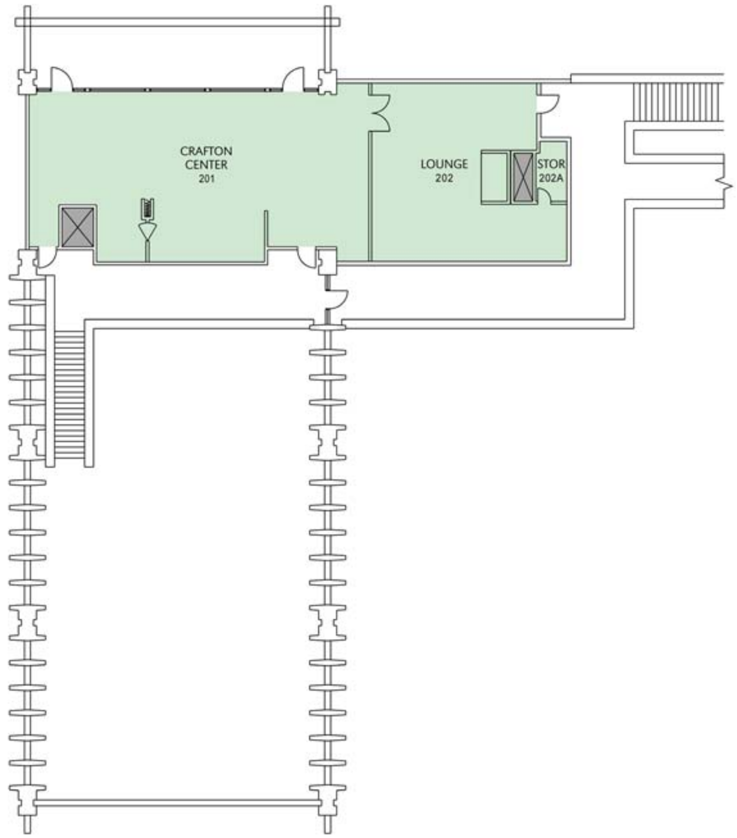


3 COLLEGE CENTER
FIRST LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'



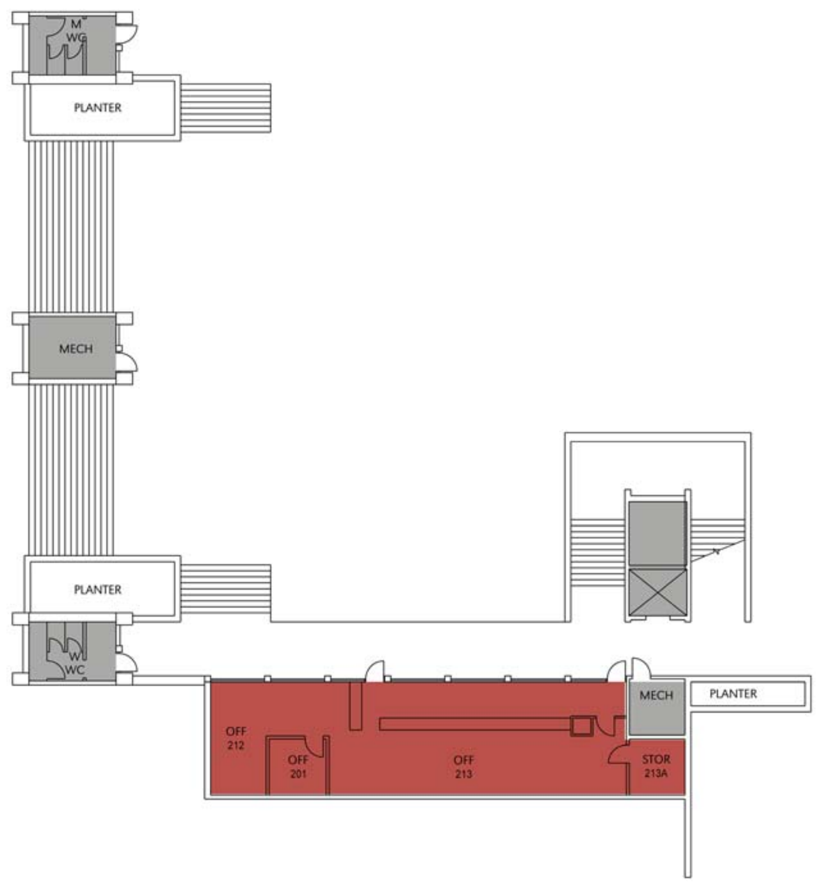
3 COLLEGE CENTER
SECOND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

4 STUDENT SERVICES A
FIRST LEVEL

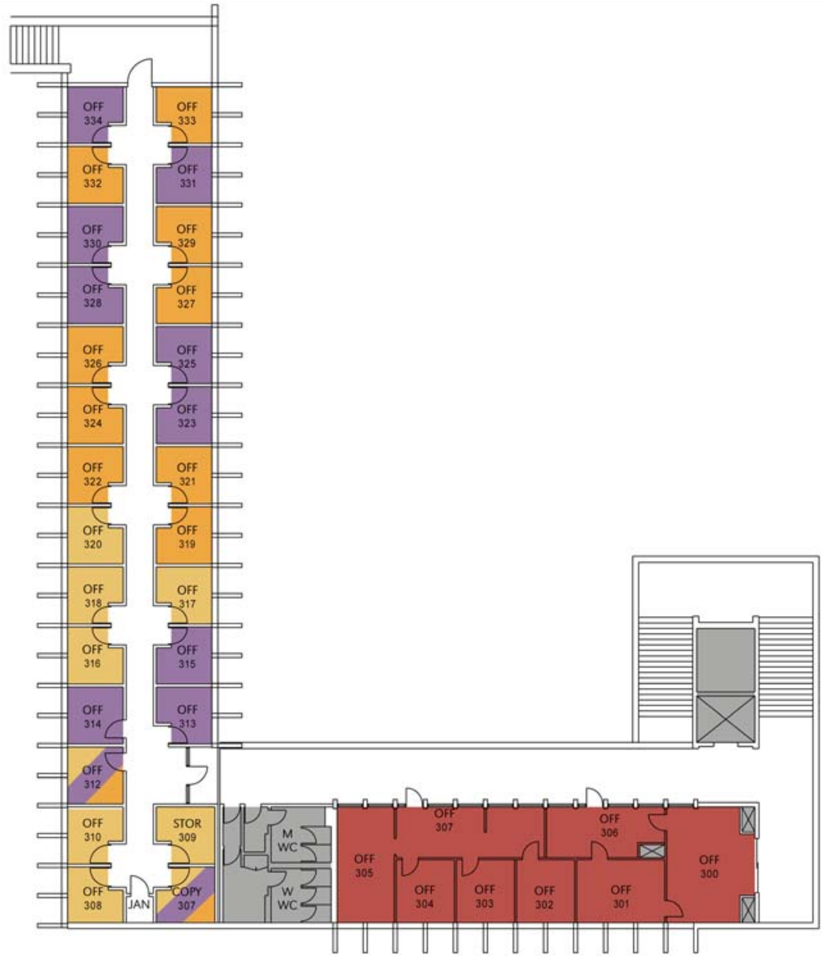


4 STUDENT SERVICES A
SECOND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

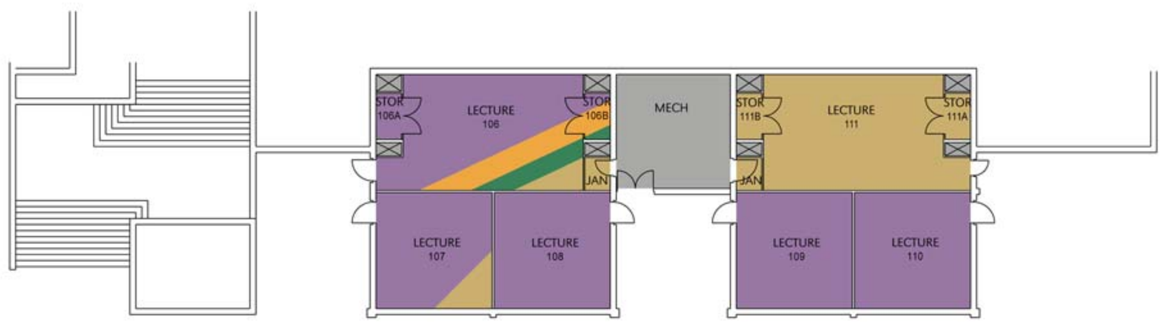


4 STUDENT SERVICES A
THIRD LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

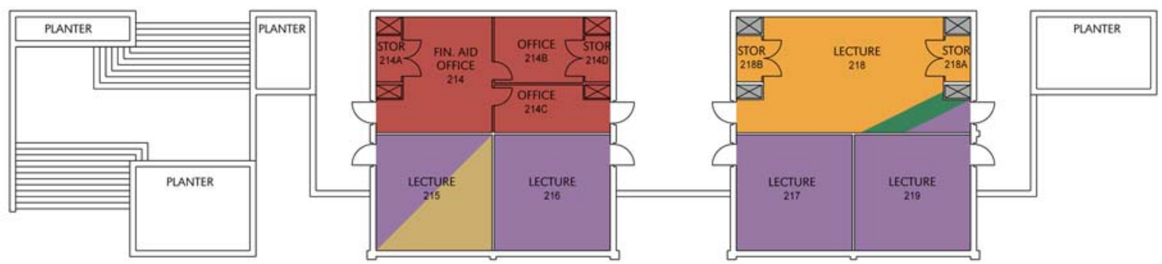


DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

5 CLASSROOM BUILDING
FIRST LEVEL

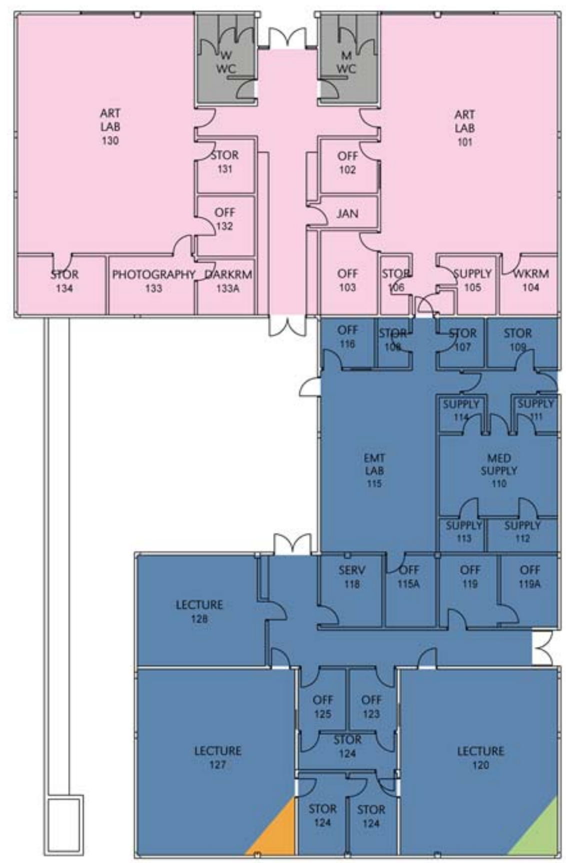


DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

5 CLASSROOM BUILDING
SECOND LEVEL

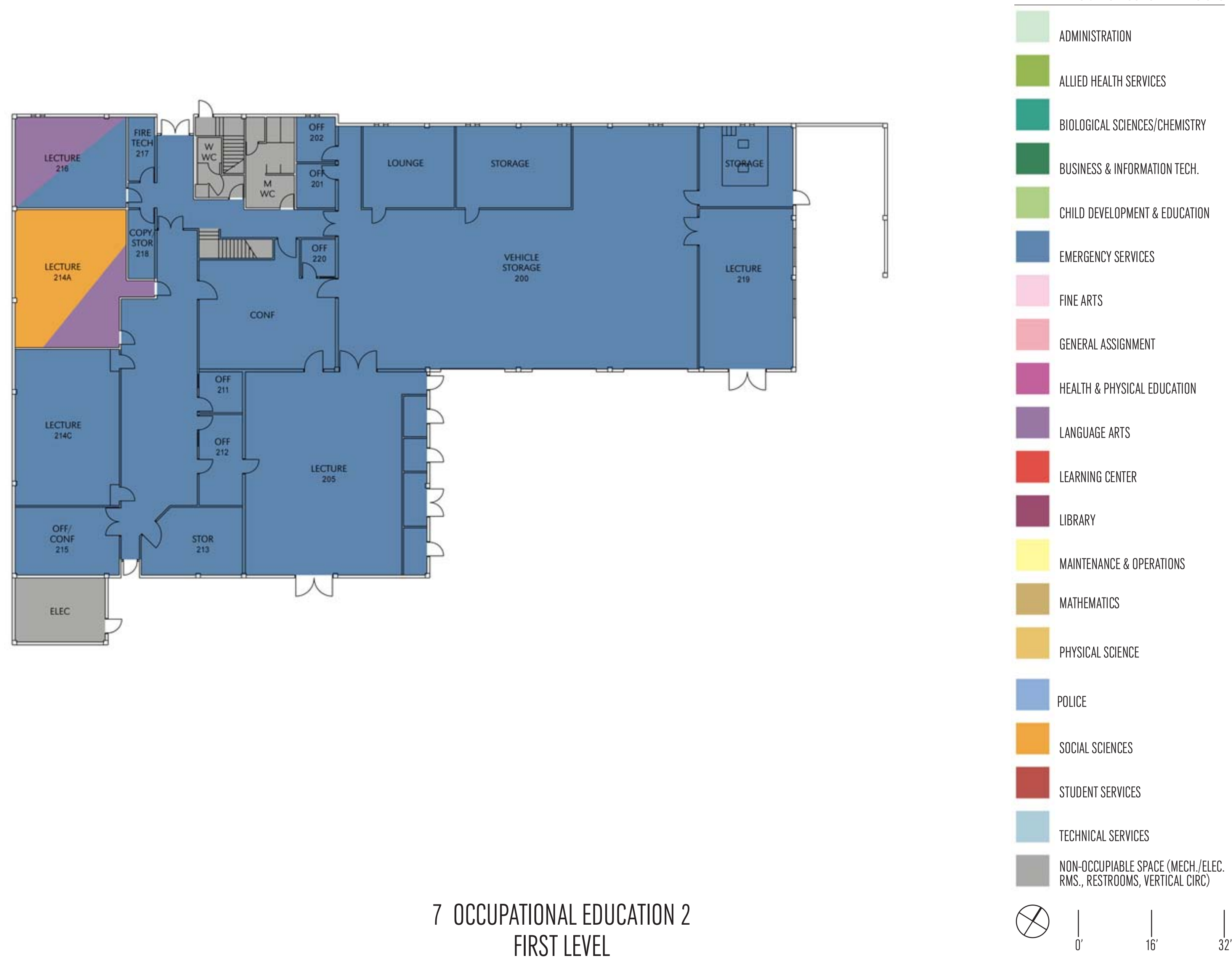


6 OCCUPATIONAL EDUCATION 1

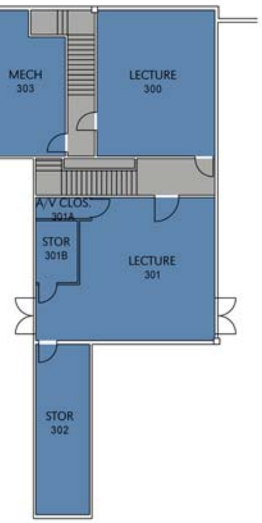
DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'



7 OCCUPATIONAL EDUCATION 2
FIRST LEVEL

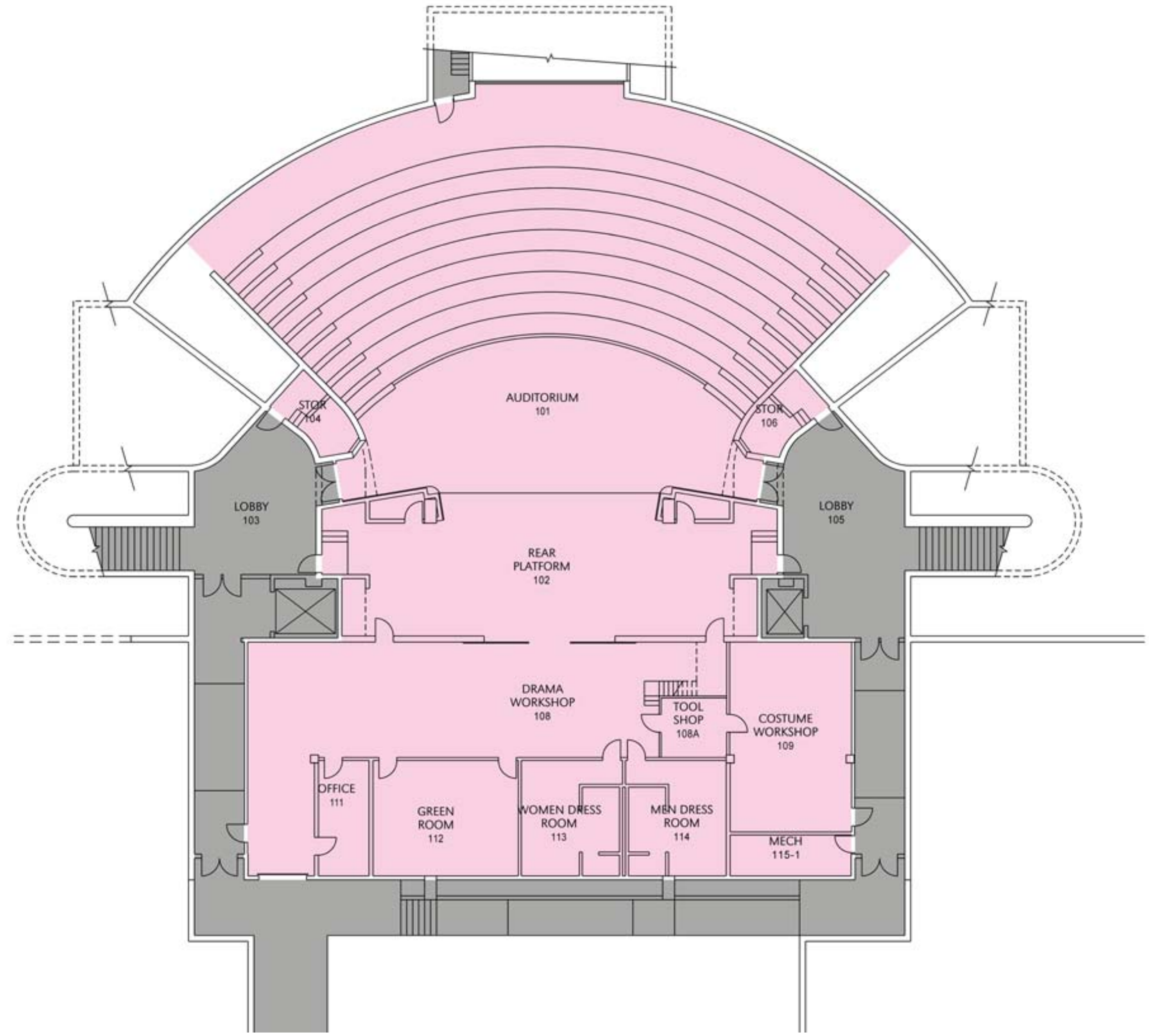


7 OCCUPATIONAL EDUCATION 2
SECOND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

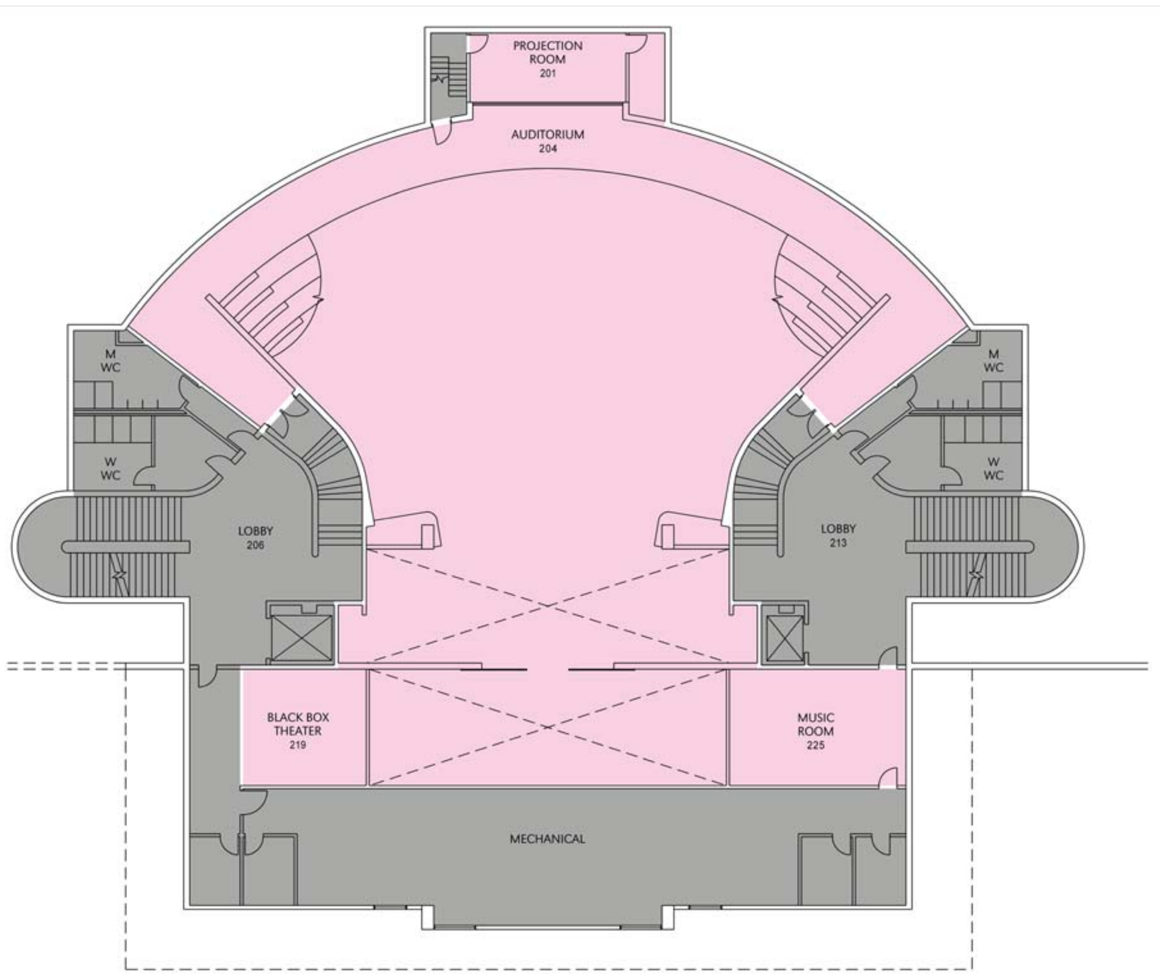


8 PERFORMING ARTS CENTER
GROUND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

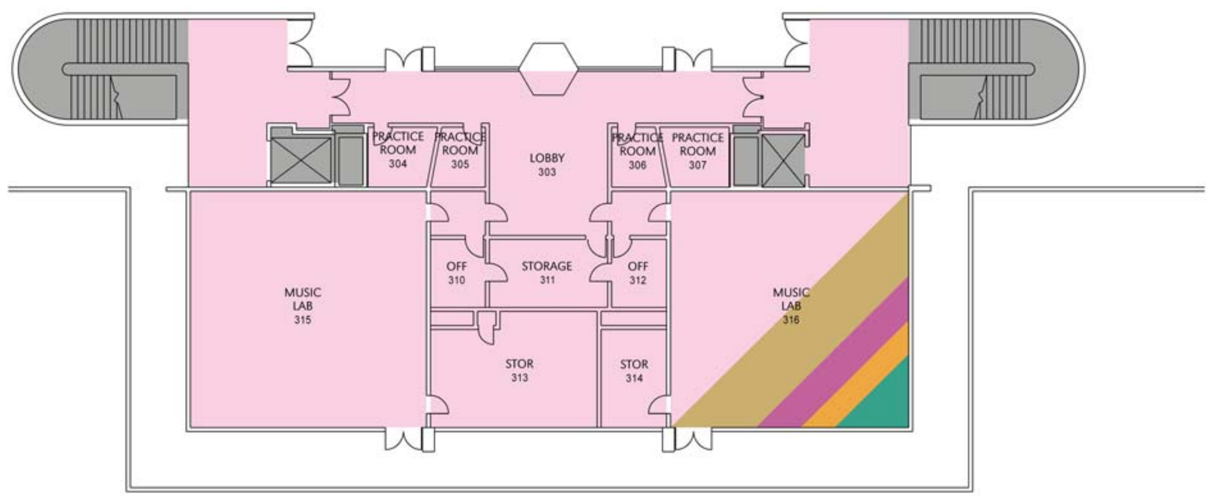


8 PERFORMING ARTS CENTER INTERMEDIATE LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'



8 PERFORMING ARTS CENTER
PLAZA LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
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- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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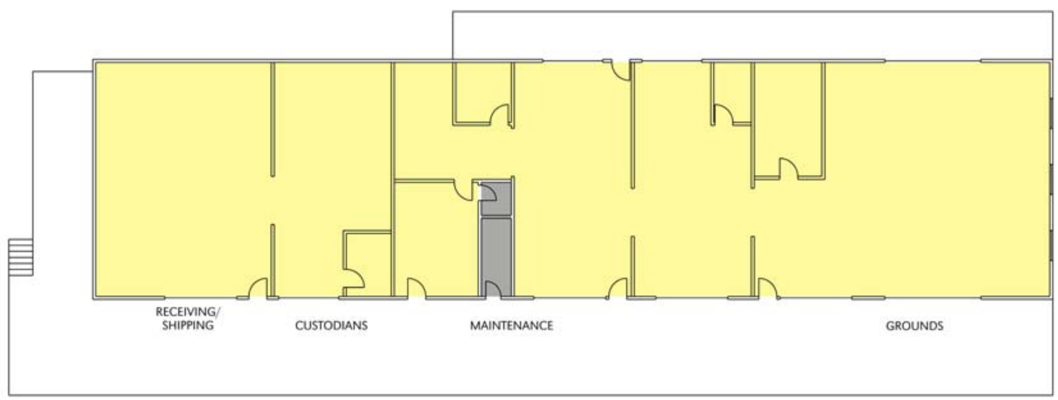

9 MAINTENANCE & OPERATIONS

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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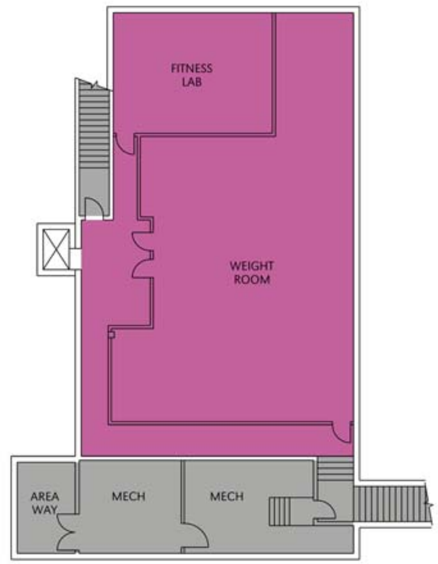
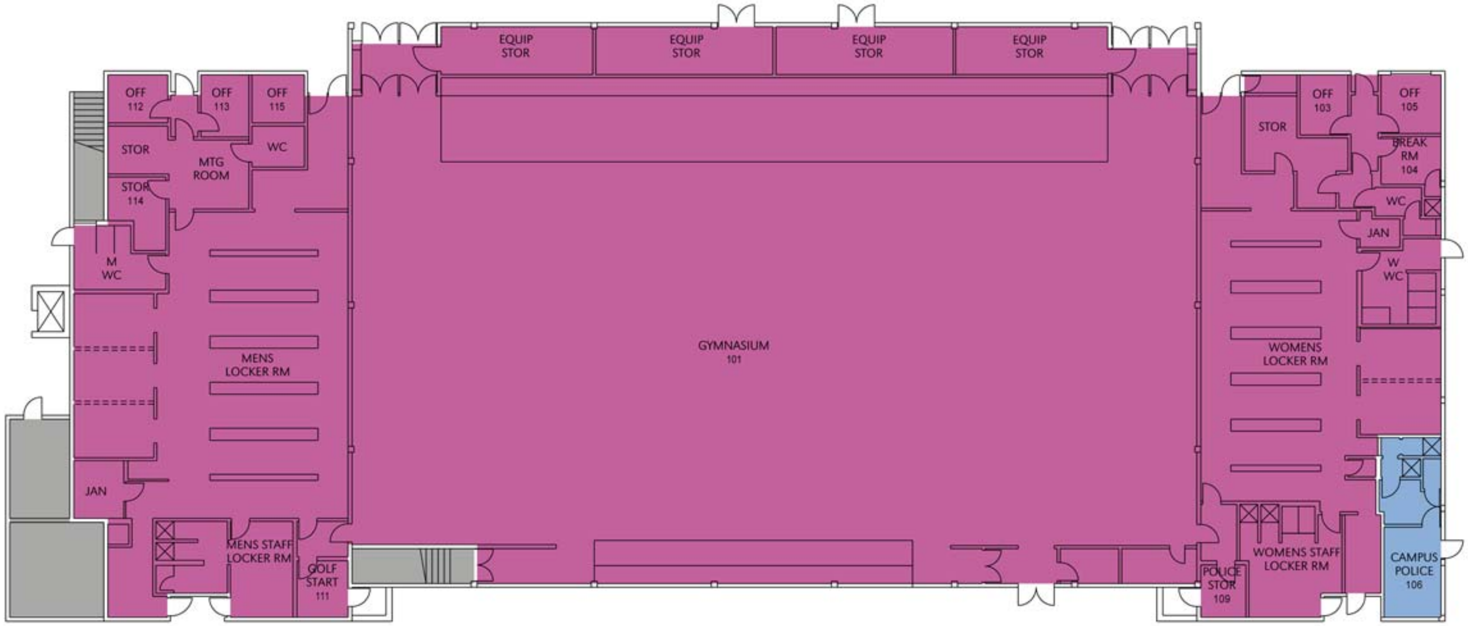


10 GYMNASIUM
BASEMENT LEVEL



10 GYMNASIUM
FIRST LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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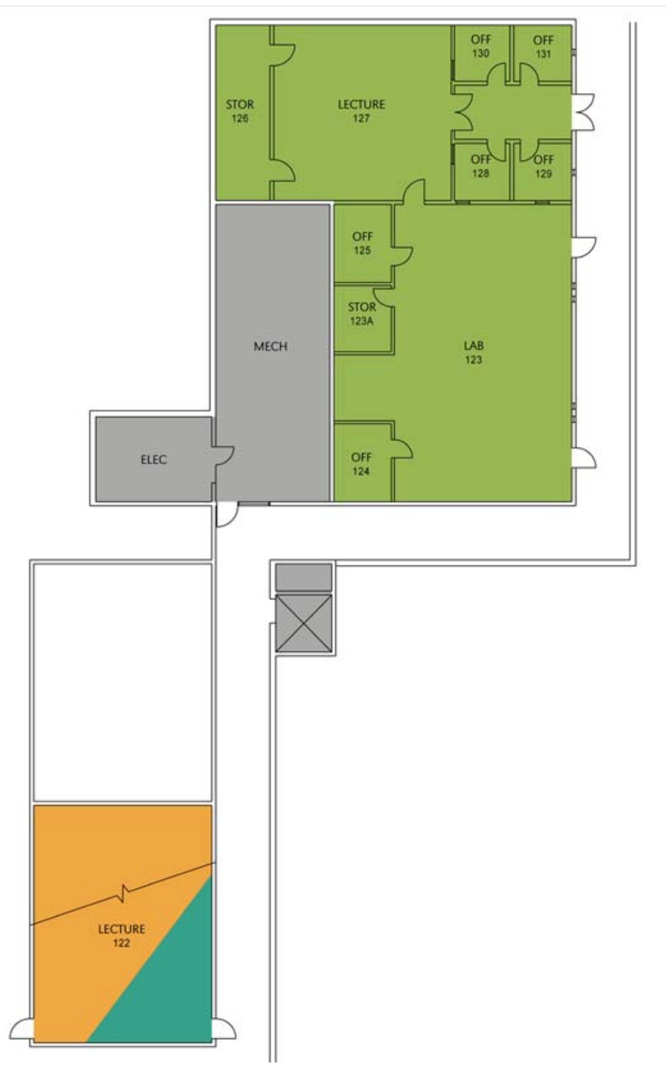

12 CHEMISTRY/ HEALTH SCIENCES
FIRST LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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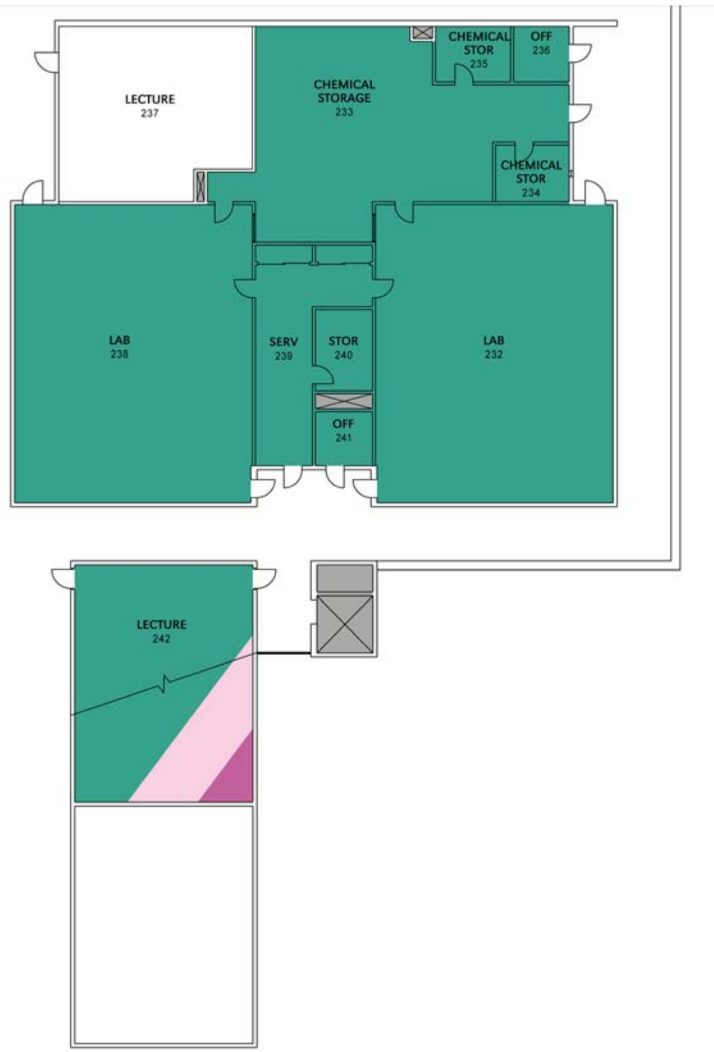

12 CHEMISTRY/ HEALTH SCIENCES
SECOND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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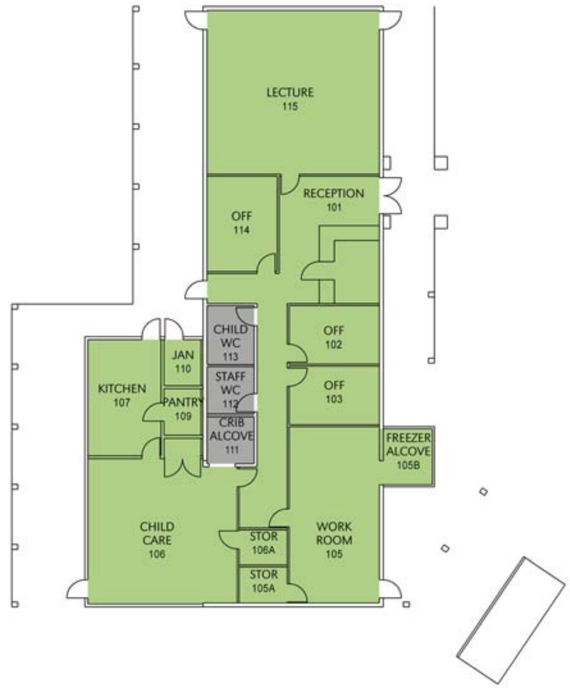

13 CHILD DEVELOPMENT CENTER #1

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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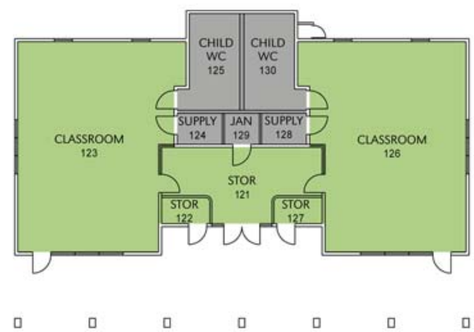

14 CHILD DEVELOPMENT CENTER

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
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- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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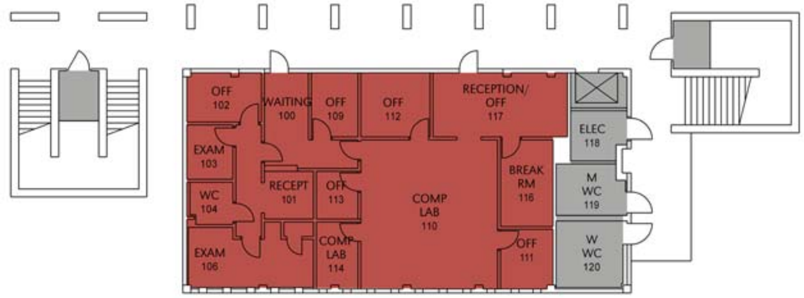

16 STUDENT SERVICES B
FIRST LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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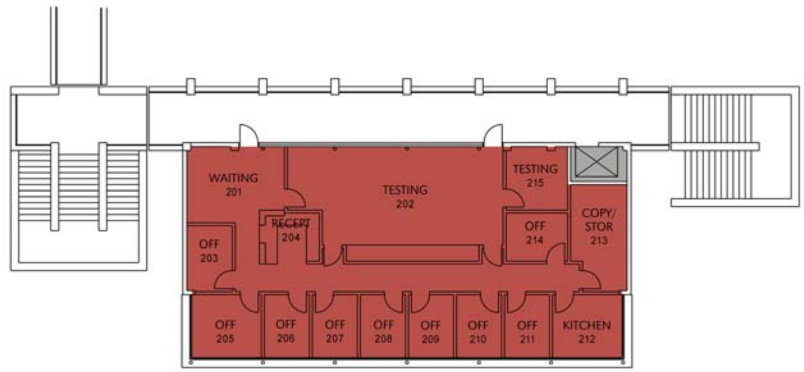

16 STUDENT SERVICES B
SECOND LEVEL

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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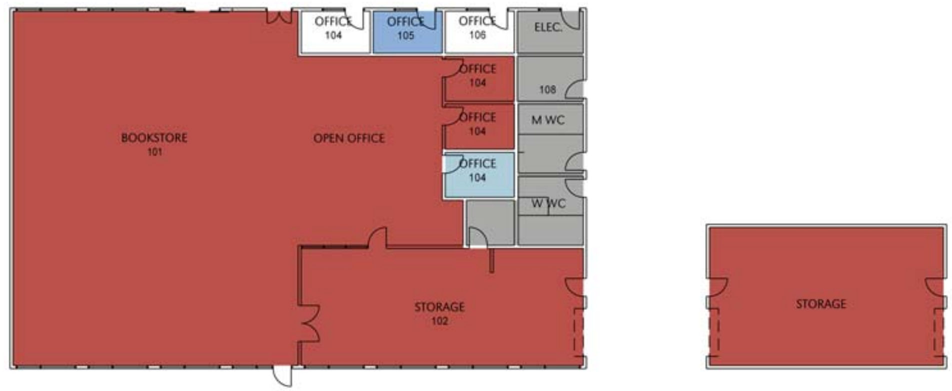

17 BOOKSTORE

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
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- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
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- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

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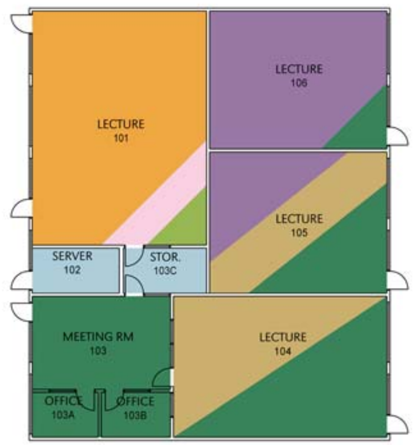

18 CLASSROOMS AT BOOKSTORE

DEPARTMENTS & INSTRUCTIONAL DIVISIONS

- ADMINISTRATION
- ALLIED HEALTH SERVICES
- BIOLOGICAL SCIENCES/CHEMISTRY
- BUSINESS & INFORMATION TECH.
- CHILD DEVELOPMENT & EDUCATION
- EMERGENCY SERVICES
- FINE ARTS
- GENERAL ASSIGNMENT
- HEALTH & PHYSICAL EDUCATION
- LANGUAGE ARTS
- LEARNING CENTER
- LIBRARY
- MAINTENANCE & OPERATIONS
- MATHEMATICS
- PHYSICAL SCIENCE
- POLICE
- SOCIAL SCIENCES
- STUDENT SERVICES
- TECHNICAL SERVICES
- NON-OCCUPIABLE SPACE (MECH./ELEC. RMS., RESTROOMS, VERTICAL CIRC)

0' 16' 32'

SPACE USE BY ROOM TYPE SUMMARY

Rm. Type		*Report 17 ASF	Revised ASF
Crafton Hills College			
000	Inactive Area	3,404	1,402
100-115	Lecture	23,920	20,693
210-255	Lab / Lab Service	35,343	36,898
300-350	Office / Service	22,837	25,876
400-450	Library	20,611	16,935
520-525	Athletics / Physical Ed.	20,891	19,012
530-535	Instruc. Media (AV/TV)	722	465
540-555	Demonstration / Service	4,103	4,453
610-625	Assembly	9,995	10,594
630-635	Food Service	5,756	5,774
650-655	Lounge/Lounge Service	1,311	2,096
660-665	Merchandise/Bookstore	4,136	4,293
670-690	Meeting Rooms	1,600	1,879
710-715	Data Processing/Comp.	1,069	695
720-740	Physical Plant	10,684	10,433
800-870	Health Services	363	272
CAMPUS TOTAL		166,745	161,770

*Existing per Report 17 (March 2005)

SPACE USE BY DEPARTMENT SUMMARY

Dept	Rm. Type		Existing ASF	2025 Target ASF	Delta ASF	
Administration			6,592	10,000	3,408	
	300-350	Office/Conference	4,244			
	650-655	Lounge / Lounge Service	830			
	670-690	Meeting Rooms	1,495			
	710-715	Data Processing/Comp	23			
Allied Health Services			3,317	3,412	95	
	100-115	Lecture	856			Included in Emergency Services
	210-255	Laboratory	1,855			Included in Emergency Services
	300-350	Office/Conference	606			
Biological Sciences & Chemistry			11,567	13,968	2,401	
	100-115	Lecture	0	1,901	1,901	
	210-255	Laboratory	10,947	11,447	500	
	300-350	Office/Conference	620			
Business and Information Tech.			4,945	13,024	8,079	
	100-155	Lecture	356	2,920	2,564	
	210-255	Laboratory	3,968	9,483	5,515	
	300-350	Office/Conference	621			
Child Development & Education			6,012	12,549	6,537	
	100-115	Lecture	782	632	-150	
	210-255	Laboratory	0	2,292	2,292	
	300-350	Office/Conference	831			
	400-450	Cluster Library	0	1,014	1,014	For CDC Cluster
	530-535	Cluster Instruc. Media	0	1,080	1,080	For CDC Cluster
	540-555	Clinic/Demonstration	4,116	6,000	1,884	
	630-635	Food Service	283			
	710-715	Cluster Support	0	417	417	For CDC Cluster
Emergency Services			12,817	24,661	11,844	
	100-115	Lecture	2,590	2,506	-84	
	210-255	Laboratory	3,127	12,544	9,417	
	300-350	Office/Conference	2,064			
	400-450	Cluster Library	0	1,014	1,014	For EMS Cluster
	530-535	Cluster Instruc. Media	0	1,080	1,080	For EMS Cluster
	650-655	Lounge / Lounge Service	452			
	670-690	Meeting Rooms	384			
	710-715	Cluster Support	0	417	417	For EMS Cluster
	720-740	Physical Plant	4,200			

Dept	Rm. Type	Existing ASF	2025 Target ASF	Delta ASF	
Fine Arts		18,090	23,567	5,477	
	100-115 Lecture	0	1,064	1,064	
	210-255 Laboratory	6,769	8,671	1,902	
	300-355 Office/Conference	681			
	400-450 Cluster Library	0	1,014	1,014	For Fine Arts Cluster
	530-535 Cluster Instruc. Media	0	1,080	1,080	For Fine Arts Cluster
	610-625 Assembly/Exhibition	10,594			
	710-715 Cluster Support	0	417	417	For Fine Arts Cluster
	720-740 Physical Plant	46			
General Assignment		14,216	30,101	15,885	
	100-115 Lecture	11,848	10,376	-1,472	
	210-255 Laboratory	2,041	16,887	14,846	
	300-350 Office/Conference	327			
	400-450 Cluster Library	0	1,014	1,014	For Humanities Cluster
	530-535 Cluster Instruc. Media	0	1,080	1,080	For Humanities Cluster
	710-715 Cluster Support	0	417	417	For Humanities Cluster
Health & Physical Education		20,362	37,511	17,149	35,000 per State Standards
	100-115 Lecture	532	190		
	300-350 Office/Conference	818			
	400-450 Cluster Library	0	1,014	1,014	For Health & PE Cluster
	520-525 Ahtletics / Physical Ed.	19,012			
	530-535 Cluster Instruc. Media	0	1,080	1,080	For Health & PE Cluster
	710-715 Cluster Support	0	417	417	For Health & PE Cluster
Language Arts		4,006	5,673	1,667	
	100-115 Lecture	710	1,156	446	
	100-115 Writing Center	0	736	736	
	210-255 Laboratory	0	1,221	1,221	
	210-255 Reading Center	0	357	357	
	300-350 Office/Conference	3,296			
Learning Center		8,924	6,565	-2,359	Included in new LRC
	100-115 Lecture	736	0	-736	Less Writing Center
	210-255 Laboratory	3,783	2,160	-1,623	Less Reading and Math Center (1,460); 2,160 per LRC FP
	300-350 Office/Conference	740	740	0	
	400-450 Library	3,343	3,343	0	
	650-655 Lounge / Lounge Service	322	322	0	
Library		13,821	33,435	19,614	40,000 per LRC FPP, Includes Learning Ctr
	210-255 Laboratory	0	0	0	Included in Learning Center
	300-350 Office/Conference	816	820	4	
	400-450 Library	12,832	14,657	1,825	
	530-535 Instruc. Media (AV/TV)	0	4,460	4,460	
	610-625 Assembly/Exhibition	0	4,992	4,992	
	650-655 Lounge / Lounge Service	173	295	122	
	670-690 Meeting Rooms	0	5,711	5,711	
	710-715 Data Processing/Comp.	0	2,500	2,500	

Dept	Rm. Type		Existing ASF	2025 Target ASF	Delta ASF	
Maintenance & Operations			5,868	10,000	4,132	
	300-350	Office/Conference	578			
	720-740	Physical Plant	5,290			
Math			3,114	11,083	7,969	
	100-115	Lecture	2,639	5,171	2,532	
	210-255	Laboratory	0	1,823	1,823	
	210-255	Math Center	0	1,103	1,103	
	300-350	Office/Conference	475			
	400-450	Cluster Library	0	1,014	1,014	For Science/Math/BIT Cluster
	530-535	Cluster Instruc. Media	0	1,080	1,080	For Science/Math/BIT Cluster
	710-715	Cluster Support	0	417	417	For Science/Math/BIT Cluster
Physical Science			4,786	13,001	8,215	
	100-115	Lecture	0	1,379	1,379	
	210-255	Laboratory	4,408	11,244	6,836	
	300-350	Office/Conference	378			
Police			1,099	1,099	0	
	300-350	Office/Conference	1,099			
Social Sciences			632	7,778	7,146	
	100-115	Lecture	0	6,123	6,123	
	210-255	Laboratory	0	1,023	1,023	
	300-350	Office/Conference	632			
Student Center			11,521	22,158	10,637	Includes 5,000 ASF for ASB
	300-350	Office/Conference	840			
	630-635	Food Service	5,491	6,883	1,392	
	660-665	Merchandise/Bookstore	4,293	9,378	5,085	
	720-740	Physical Plant	897			Bookstore Storage
Student Services			7,811	16,290	8,479	
	300-350	Office/Conference	6,123			
	400-450	Library	760			
	540-555	Clinic/Demonstration	337			
	650-655	Lounge/Lounge Service	319			
	800-870	Health Service	272	1,200	928	
Technical Services			1,905	1,233	-672	
	300-350	Office/Conference	768	768	0	
	530-535	Instruc. Media (AV/TV)	465	465	0	
	710-715	Data Processing/Comp.	672			2,500 ASF in new LRC, 2,500 ASF distributed in Academic Clusters
Inactive Area			1,402	0	-1,402	
	000	Inactive Area	1,402	0	-1,402	
CAMPUS TOTAL			162,807	297,108		

SPACE USE BY DEPARTMENT

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
Administration					6,592	
01	Lab / Admin					
			Office		3,095	
01	151	310	Office	186		CBO
01	165	310	Office	264		Asst. VP Admin Services
01	166	310	Office	158		VP Admin Services
01	167	310	Office	97		Facilities
01	222	310	Office	187		VP Admin Services
01	300	310	Office	1,059		
01	300B	310	Office	135		
01	300C	310	Office	135		
01	300D	310	Office	135		
01	300E	310	Office	135		
01	300F	310	Office	131		
01	301	310	Office	203		President
01	301B	310	Office	120		
01	303	310	Office	150		VP Instruction
			Conference		347	
01	161	350	Conference Room	201		
01	302	350	Conference Room	146		
			Support		802	
01	150	315	Lobby	157		
01	152	315	Office Service	62		Counting / Safe
01	160	315	Break Room	133		
01	162	315	Storage	65		
01	300A	315	Office Service	174		
01	300H	315	Office Service	23		
01	300I	315	Office Service	43		
01	301A	315	Office Service	36		
01	301C	315	Office Service	52		
01	305	315	Storage	57		
			Support		23	
01	300G	715	DP/Computer Service	23		
03	Student Center					
			Other		1,495	
03	201	680	Meeting Room	1,495		
			Other		830	
03	202	650	Lounge	780		
03	202A	655	Lounge Service/Stor	50		
Allied Health Services					3,317	
12	Chemistry / Health Science					
			Lecture		856	
12	127	110	Lecture	856		
			Lab / Lab Service		1,855	
12	123	210	Class Lab	1,487		
12	123A	215	Class Lab Service	105		
12	126	215	Class Lab Service	263		
			Office		606	
12	124	310	Office	125		
12	125	310	Office	125		
12	128	315	Office	88		
12	129	310	Office	92		
12	130	310	Office	86		
12	131	310	Office	90		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
Biological Sciences & Chemistry					**11,567**	
01	**Lab / Admin**					
			Lab / Lab Service		5,041	
01	**211**	210	Class Lab	1,111		
01	**225**	210	Class Lab	1,169		
01	**201**	210	Class Lab	1,121		
01	**203**	215	Class Lab Service	176		
01	**204**	215	Class Lab Service	430		
01	**205**	215	Class Lab Service	67		
01	**207**	215	Class Lab Service	150		Storage/Lounge
01	**208**	215	Class Lab Service	88		
01	**209**	215	Class Lab Service	159		
01	**212**	215	Class Lab Service	32		
01	**213**	215	Class Lab Service	75		
01	**227**	215	Class Lab Service	180		
01	**228**	210	Class Lab Service	16		
01	**229**	215	Class Lab Service	86		
01	**231**	210	Class Lab Service	181		Storage
			Office		350	
01	**202**	310	Office	89		Chair
01	**210**	310	Office	89		
01	**226**	310	Office	86		
01	**230**	310	Office	86		
			Support		98	
01	**206**	315	Office Service	98		
12	**Chemistry / Health Sciences**					
			Lab / Lab Service		5,906	
12	**232**	210	Class Lab	1,879		
12	**238**	210	Class Lab	1,879		
12	**233**	215	Class Lab Service	1,337		
12	**234**	210	Class Lab Service	115		
12	**235**	215	Class Lab Service	116		
12	**239**	215	Class Lab Service	452		
12	**240**	215	Class Lab Service	128		Storage
			Office		172	
12	**236**	310	Office	86		
12	**241**	310	Office	86		
Business and Information Tech.					**4,945**	
01	**Lab / Admin**					
			Lab / Lab Service		3,968	
01	**101**	220	Spec Class Lab	1,203		
01	**216**	210	Class Lab	1,137		
01	**217**	210	Class Lab	753		
01	**220**	210	Class Lab	875		CISCO
			Office		358	
01	**103**	310	Office	91		Chair
01	**215**	310	Office	87		
01	**218**	310	Office	87		
01	**219**	310	Office	93		CISCO
			Support		73	
01	**104A**	315	Office Service	73		
18	**BC**					
			Lecture		356	
18	**103**	115	Lecture Service	356		
			Office		190	
18	**103B**	310	Office	86		
18	**103C**	310	Office	104		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
Child Development & Education					**6,012**	
13	**Child Devel 1**					
			Lecture		782	
13	**115**	110	Lecture	782		
			Office		831	
13	**101**	310	Office	354		Reception
13	**102**	310	Office	146		
13	**103**	310	Office	146		
13	**114**	310	Office	185		
			Demonstration / Service		1,324	
13	**105**	550	Demonstration	440		
13	**106**	550	Demonstration	653		
13	**105A**	555	Demonstration Service	47		Storage
13	**105B**	555	Demonstration Service	76		Freezer Alcove
13	**106A**	555	Demonstration Service	47		Storage
13	**108**	555	Demonstration Service	61		Crib Alcove
			Food Facilities / Service		283	
13	**107**	630	Food Facilities	235		
13	**109**	635	Food Facilities Service	48		
14	**Child Devel 2**					
			Demonstration / Service		1,906	
14	**123**	550	Demonstration	879		
14	**126**	550	Demonstration	879		
14	**122**	555	Demonstration Service	35		Storage
14	**124**	555	Demonstration Service	39		Supply
14	**127**	555	Demonstration Service	35		Storage
14	**128**	555	Demonstration Service	39		Supply
15	**Child Devel 3**					
			Demonstration / Service		886	
15	**101**	550	Demonstration	886		
Emergency Services					**12,817**	
06	**OE 1**					
			Lecture		1,813	
06	**120**	110	Lecture	814		
06	**122**	115	Lecture Service	110		
06	**124**	115	Lecture Service	110		
06	**127**	110	Lecture	779		
			Lab / Lab Service		1,303	
06	**115**	210	Class Lab	582		
06	**107**	215	Class Lab Service	62		
06	**108**	215	Class Lab Service	43		
06	**109**	215	Class Lab Service	97		
06	**110**	215	Class Lab Service	267		
06	**111**	215	Class Lab Service	42		
06	**112**	215	Class Lab Service	65		
06	**114**	215	Class Lab Service	43		
06	**117**	215	Class Lab Service	102		
			Office		469	
06	**116**	310	Office	74		
06	**119**	310	Office	117		
06	**119A**	310	Office	114		
06	**123**	310	Office	82		
06	**125**	310	Office	82		
			Support		222	
06	**118**	315	Office Service	123		
06	**121**	315	Office Service	99		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
			Other		384	
06	**128**	680	Meeting Room	384		
07	OE 2					
			Lecture		777	
07	**214C**	110	Lecture	777		
			Lab / Lab Service		1,824	
07	**205**	210	Lab	1,517		
07	**213**	215	Class Lab Service	307		
			Office		582	
07	**201**	310	Office	82		
07	**202**	310	Office	84		
07	**211**	310	Office	85		
07	**212**	310	Office	189		
07	**217**	310	Office	81		
07	**220**	310	Office	61		
			Support		88	
07	**218**	315	Office Service	88		
			Conference		703	
07	**200A**	350	Conference Room	703		
			General Use		452	
07	**200B**	650	Lounge	452		
			Storage		4,200	
07	**200**	740	Vehicle Storage	3,228		
07	**200C**	730	Storage	447		
07	**200D**	730	Storage	360		
07	**206**	730	Storage	35		
07	**207**	730	Storage	35		
07	**208**	730	Storage	53		
07	**209**	730	Storage	42		
Fine Arts					**18,090**	
06	OE 1					
			Lab / Lab Service		3,024	
06	**101**	210	Class Lab	1,110		
06	**103**	215	Class Lab Service	133		
06	**130**	210	Class Lab	1,056		
06	**104**	215	Class Lab Service	95		
06	**105**	215	Class Lab Service	79		
06	**131**	215	Class Lab Service	85		
06	**133**	215	Class Lab Service	139		
06	**132**	215	Class Lab Service	95		
06	**133A**	215	Class Lab Service	88		
06	**134**	215	Class Lab Service	144		
			Office		85	
06	**102**	310	Office	85		
			Storage		46	
06	**106**	730	Storage	46		
08	Performing Arts Center					
			Lab / Lab Service		3,745	
08	**219**	210	Class Lab	576		Black Box Theater
08	**225**	210	Class Lab	564		Music Room
08	**315**	210	Class Lab	1,547		
08	**304**	230	Individual Study Lab	107		
08	**305**	230	Individual Study Lab	82		
08	**306**	230	Individual Study Lab	82		
08	**307**	230	Individual Study Lab	107		
08	**313**	215	Class Lab Service	502		
08	**314**	215	Class Lab Service	178		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
			Office		596	
08	**111**	310	Office	165		
08	**310**	310	Office	104		
08	**312**	310	Office	104		
08	**311**	315	Office Service	223		
			Assembly		10,594	
08	**101**	610	Assembly	4,870		
08	**102**	615	Assembly Service	1,593		
08	**104**	615	Assembly Service	110		
08	**106**	615	Assembly Service	110		
08	**108**	615	Assembly Service	1,667		
08	**108A**	615	Assembly Service	110		
08	**109**	615	Assembly Service	651		
08	**112**	615	Assembly Service	474		
08	**113**	615	Assembly Service	313		
08	**114**	615	Assembly Service	312		
08	**201**	615	Assembly Service	299		
08	**202**	615	Assembly Service	85		
General Assignment					**14,216**	
01	**Lab / Admin**					
			Lecture		3,277	
01	**121**	110	Lecture	1,167		
01	**224**	110	Lecture	1,177		
01	**304**	110	Lecture	933		
02	**Library**					
			Lecture		373	
02	**347**	110	Lecture	373		
04	**Student Services**					
			Office		167	
04	**312**	310	Office	88		
04	**317**	310	Office	79		
05	**Classroom Building**					
			Lecture		1,741	
05	**106**	110	Lecture	605		
05	**106A**	110	Lecture Service	33		
05	**106B**	110	Lecture Service	33		
05	**107**	110	Lecture	374		
05	**218**	110	Lecture	630		
05	**218A**	110	Lecture Service	33		
05	**218B**	110	Lecture Service	33		
07	**OE 2**					
			Lecture		1,456	
07	**214A**	110	Lecture	738		
07	**219**	110	Lecture	718		
			Lab		481	
07	**216**	220	Spec Class Lab	481		
8	**Performing Arts Center**					
			Lab / Lab Service		1,560	
08	**316**	210	Class Lab	1,560		
12	**Chemistry / Health Sciences**					
			Lecture		2,343	
12	**122**	110	Lecture	1,172		
12	**242**	110	Lecture	1,171		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
17	**BK**					
			Office		160	
17	**104**	310	Office	80		
17	**105**	310	Office	80		
18	**BC**					
			Lecture		2,658	
18	**101**	110	Lecture	1,131		Social Sciences
18	**104**	110	Lecture	834		
18	**105**	110	Lecture	693		
Health & Physical Education					**20,362**	
10	**Gymnasium**					
			Lecture		532	
10	**2**	110	Lecture	532		Fitness Lab
			Office		492	
10	**103**	310	Office	80		
10	**105**	310	Office	97		
10	**111**	310	Office	80		Golf Starter
10	**112**	310	Office	82		
10	**113**	310	Office	83		
10	**115**	310	Office	70		
			Support		326	
10	**103A**	315	Office Service	196		
10	**104**	315	Office Service	80		
10	**111A**	315	Office Service	50		Golf Starter
			Education		19,012	
10	**1**	520	Athletics/Phys. Ed	1,988		Weight Room
10	**101**	520	Ahltetics/Phys. Ed	9,304		Gym
10	**101A**	523	Athletics Spectator Seat	1,924		Seating
10	**102**	525	Athletics/Phys. Ed Service	26		
10	**108**	525	Athletics/Phys. Ed Service	73		
10	**109**	525	Athletics/Phys. Ed Service	57		
10	**110**	525	Athletics/Phys. Ed Service	153		
10	**110A**	525	Athletics/Phys. Ed Service	81		
10	**114**	525	Athletics/Phys. Ed Service	97		
10	**116**	525	Ahltetics/Phys. Ed Service	200		Equip. Storage
10	**117**	525	Athletics/Phys. Ed Service	234		Equip. Storage
10	**118**	525	Athletics/Phys. Ed Service	234		Equip. Storage
10	**119**	525	Ahltetics/Phys. Ed Service	201		Equip. Storage
10	**120**	525	Athletics/Phys. Ed Service	1,696		Women's Locker Room
10	**120A**	525	Ahltetics/Phys. Ed Service	280		Women's Locker Room
10	**121**	525	Athletics/Phys. Ed Service	2,158		Men's Locker Room
10	**121A**	525	Athletics/Phys. Ed Service	306		Men's Locker Room
Language Arts					**4,006**	
04	**Student Services**					
			Office		710	
04	**310**	310	Office	78		
04	**315**	310	Office	79		
04	**321**	310	Office	79		
04	**323**	310	Office	79		
04	**325**	310	Office	79		
04	**326**	310	Office	79		
04	**328**	310	Office	79		
04	**330**	310	Office	79		
04	**334**	310	Office	79		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
05	**Classroom Building**					
			Lecture		2,618	
05	**108**	110	Lecture	374		
05	**109**	110	Lecture	374		
05	**110**	110	Lecture	374		
05	**215**	110	Lecture	374		
05	**216**	110	Lecture	374		
05	**217**	110	Lecture	374		
05	**219**	110	Lecture	374		
18	**BC**					
			Lecture		678	
18	**106**	110	Lecture	678		
Learning Center					**8,924**	
2	**Library**					
			Lecture		736	Writing Center
02	**331**	110	Lecture	736		
			Lab / Lab Service		3,783	
02	**342**	220	Spec. Class Lab	1,103		Math Center
02	**343**	220	Spec. Class Lab	1,345		Computer Lab
02	**344**	220	Spec. Class Lab	238		Testing
02	**308**	220	Spec. Class Lab	357		Reading Center
02	**309**	250	Non-Class Lab	740		Open Computer Lab
			Office		740	
02	**305**	310	Office	74		
02	**306**	350	Office	74		
02	**307**	310	Office	74		
02	**314**	310	Office	74		
02	**315**	310	Office	74		
02	**316**	310	Office	74		
02	**326**	310	Office	74		Academic Senate
02	**339**	310	Office	74		
02	**340**	310	Office	74		Academic Senate
02	**341**	310	Office	74		
			Lounge		322	
02	**332**	650	Lounge	322		
			Other		3,343	
02	**310**	440	Processing Room	448		Teaching Aids
02	**310A**	445	Processing Room Serv.	285		Teaching Aids
02	**313**	410	Read/Study Room	2,372		Computer Lab
02	**346**	410	Read/Study Room	238		Computer Lab
Library					**13,821**	
2	**Library**					
			Office		816	
02	**106**	310	Office	140		
02	**107**	310	Office	186		
02	**212**	310	Office	128		
02	**213**	310	Office	94		
02	**214**	310	Office	94		
02	**215**	310	Office	174		
			Other		12,832	
02	**101**	430	Open Stack Reading Rm	5,685		
02	**206**	430	Open Stack Reading Rm	5,958		
02	**208**	440	Processing Room	679		
02	**208A**	440	Processing Room	255		
02	**211**	440	Processing Room	255		
			Lounge		173	
02	**205**	650	Lounge	173		Break Room

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
Maintenance & Operations					**5,868**	
06	**OE 1**					
			Other		41	
06	**113**	730	Storage	41		Facilities
9	**Maintenance**					
			Office		578	
09	**103**	310	Office	82		
09	**104**	310	Office	296		
09	**111**	310	Office	200		
			Other		5,249	
09	**101**	730	Storage	1,119		
09	**102**	730	Storage	661		
09	**105**	720	Shop	202		
09	**106**	725	Shop Service	81		
09	**107**	720	Shop	752		
09	**108**	720	Shop	681		
09	**109**	725	Shop Service	68		
09	**110**	720	Shop	1,273		
09	**110A**	725	Shop Service	103		
09	**110B**	725	Shop Service	103		
09	**110C**	725	Shop Service	103		
09	**110D**	725	Shop Service	103		
Math					**3,114**	
02	**Library**					
			Lecture		1,080	
02	**348**	110	Lecture	1,080		
04	**Student Services**					
			Office		475	
04	**308**	310	Office	76		
04	**309**	310	Office	83		
04	**313**	310	Office	79		
04	**316**	310	Office	79		
04	**318**	310	Office	79		
04	**320**	310	Office	79		
05	**Classroom Building**					
			Lecture		671	
05	**111**	110	Lecture	605		
05	**111A**	110	Lecture Service	33		
05	**111B**	110	Lecture Service	33		
12	**Chemistry / Health Sciences**					
			Lecture		888	
12	**237**	110	Lecture	888		
Physical Science					**4,786**	
01	**Lab / Admin**					
			Lab / Lab Service		4,408	
01	**106**	210	Class Lab	1,164		
01	**115**	210	Class Lab	1,220		
01	**102**	215	Class Lab Service	123		Darkroom
01	**102A**	215	Class Lab Service	123		Darkroom
01	**108**	215	Class Lab Service	157		
01	**108A**	215	Class Lab Service	77		
01	**112**	215	Class Lab Service	544		
01	**113**	215	Class Lab Service	76		
01	**114**	215	Class Lab Service	80		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
01	**116**	215	Class Lab Service	204		
01	**117**	215	Class Lab Service	376		
01	**119**	215	Class Lab Service	113		
01	**120**	215	Class Lab Service	151		
			Office		378	
01	**105**	310	Office	91		
01	**107**	310	Office	185		
01	**118**	310	Office	102		
Police					**1,099**	
01	**Lab / Admin**					
			Office		617	
01	**153**	310	Office	165		Communications
01	**154**	310	Office	77		
01	**155**	310	Office	75		Corporal
01	**156**	310	Office	116		Police Supervisor
01	**221**	310	Office	184		
10	**Gymnasium**					
			Office		402	
10	**106**	310	Office	143		Patrol
10	**106A**	315	Office Service	136		Patrol
10	**107**	315	Office Service	66		Patrol
10	**107A**	315	Office Service	57		Patrol
17	**BK**					
			Office		80	
17	**106**	310	Office	80		Police
Social Sciences					**632**	
04	**Student Services**					
			Office		632	
04	**319**	310	Office	79		
04	**322**	310	Office	79		
04	**324**	310	Office	79		
04	**327**	310	Office	79		
04	**329**	310	Office	79		
04	**331**	310	Office	79		
04	**332**	310	Office	79		
04	**333**	310	Office	79		
Student Center					**11,521**	
03	**Student Center**					
			Office		582	
03	**106A**	310	Office	73		Food Facilities
03	**107**	310	Office	383		ASB
03	**107A**	310	Office	126		ASB
			Food Facilities/Service		5,491	
03	**101**	630	Food Facilities	4,117		
03	**102**	635	Food Facilities Service	825		
03	**103**	635	Food Facilities Service	155		
03	**103A**	635	Food Facilities Service	31		
03	**105**	635	Food Facilities Service	154		
03	**106**	635	Food Facilities Service	160		
03	**106B**	635	Food Facilities Service	49		
17	**BK - Bookstore**					
			Office		258	
17	**103A**	310	Office	86		
17	**103B**	310	Office	86		
17	**103C**	310	Office	86		

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
			Merchandise		4,293	
17	**101**	660	Merchandise Facility	2,503		
17	**102**	665	Merchandise Fac. Service	913		
17	**103**	660	Merchandise Facility	877		
35	**Building 0**					
			Storage		897	Bookstore Warehouse
35	**1**	730	Storage	897		
Student Services					**7,811**	
04	**Student Services**					
			Office		1,971	
04	**201**	310	Office	89		A/R
04	**213**	310	Office	918		A/R
04	**300**	310	Office	260		Chair
04	**301**	310	Office	154		
04	**302**	310	Office	102		EOPS/CalWORKs
04	**303**	310	Office	102		EOPS/CalWORKs
04	**304**	310	Office	102		EOPS/CalWORKs
04	**306**	310	Office	156		
04	**314**	310	Office	88		
			Support		828	
04	**306A**	315	Office Service	206		
04	**212**	315	Office Service	269		A/R
04	**213A**	315	Office Service	89		Vault
04	**305**	315	Office Service	183		EOPS/CalWORKs
04	**307**	315	Office Service	81		EOPS/CalWORKs
05	**Classroom Building**					
			Office		618	Financial Aid
05	**214**	310	Office	312		
05	**214B**	310	Office	163		
05	**214C**	310	Office	143		
			Support		66	Financial Aid
05	**214A**	315	Office Service	33		
05	**214D**	315	Office Service	33		
07	**OE 2**					
			Demonstration		337	
07	**215**	550	Demonstration	337		Workforce Development
16	**SSB**					
			Office		1,525	
16	**102**	310	Office	100		Health Services
16	**109**	310	Office	83		Health Services
16	**112**	310	Office	123		DSPS
16	**117**	310	Office	237		DSPS
16	**203**	310	Office	83		Counseling
16	**204**	310	Office	84		Counseling
16	**205**	310	Office	122		Counseling
16	**206**	310	Office	79		Counseling
16	**207**	310	Office	79		Counseling
16	**208**	310	Office	79		Counseling
16	**209**	310	Office	79		Counseling
16	**210**	310	Office	79		Counseling
16	**211**	310	Office	79		Counseling
16	**214**	310	Office	107		Counseling
16	**215**	310	Office	112		Counseling

Bldg No.	Rm No.	Rm. Type	Room Name	Sub. ASF	Total ASF	Notes
			Support		502	
16	**100**	315	Office Service	153		Health Services
16	**101**	315	Office Service	65		Health Services
16	**116**	315	Office Service	126		DSPS
16	**213**	310	Office Service	158		Counseling
			Conference		613	
16	**202**	350	Conference Room	613		Testing
			Health Service		272	
16	**103**	850	Treatment	70		Health Services
16	**106**	850	Treatment	190		Health Services
16	**106A**	855	Treatment	12		Health Services
			Library		760	
16	**110**	410	Read/Study Room	563		DSPS
16	**111**	410	Read/Study Room	86		DSPS
16	**113**	410	Read/Study Room	55		DSPS
16	**114**	410	Read/Study Room	56		DSPS
			Lounge		319	
16	**201**	650	Lounge	197		Waiting
16	**212**	650	Lounge	122		Kitchen
Technical Services					1,905	
01	**Lab / Admin**					
			Office		186	
01	**222A**	310	Office	93		
01	**222B**	310	Office	93		
			Support		428	
01	**222C**	715	DP/Computer Service	93		
01	**222D**	715	DP/Computer Service	335		
02	**Library**					
			Office		500	
02	**317**	310	Office	353		
02	**327**	310	Office	74		
02	**328**	310	Office	73		
			Data Processing		244	
02	**3**	715	DP/Computer Service	244		
			Support		357	
02	**329**	530	Audio/Visual, Radio, TV	357		
18	**BC**					
			Office		82	
18	**103A**	310	Office	82		
			Support		108	
18	**102**	535	Audio/Visual, Radio, TV	108		
Inactive Area					**1,402**	
07	**OE 2**					
			Inactive		1,402	
07	**300**	050	Inactive Area	478		Lecture
07	**301**	050	Inactive Area	597		
07	**301B**	050	Inactive Area	72		
07	**302**	050	Inactive Area	255		Storage

3 | PROJECTED SPACE NEEDS

SUMMARY

By the year 2025, Crafton Hills College will more than double in size with a 125% increase in enrollment. Per the State standards, in order to support the projected 11, 470 students, the physical campus will need to construct 122,226 ASF – a 73% increase bringing the campus to a total of 288,930 ASF. By 2012, the campus will need to construct approximately 28,884 ASF to accommodate the increase in enrollment from 5,400 students to 7,150. Overall, the types of space that need to expand the most are laboratories, library, physical education (indoor), instructional media spaces, and data processing and computers. The programs that will experience the most growth are the Physical Sciences, Mathematics, Computer & Information Sciences, Interdisciplinary Studies, and Health Science.

Based on the existing and projected ASF required for 7,150 students, the current facilities are overbuilt (i.e., there is too much space assigned to a particular room use than the college can justify) for the following categories: lecture, office/conference, assembly/exhibition, food service, and physical plant. Even with increased enrollment, newly constructed space in these areas is not required. Instead, a more efficient rearrangement and/or reassignment of the existing spaces are recommended. New construction on campus for 2012 will primarily contain laboratory, instructional media (AV/TV), and the data processing spaces.

Lecture, lab, and offices are the most critical room use categories to track on campus because they affect the eligibility for State funding on future projects. However, based on campus need and program growth projections for 2012, each room use category is addressed individually:

1. Inactive Area – The inactive areas in the first floor of the Lab/Administration Building, totaling 2,423 ASF, will be converted to offices for the Vice President of Administrative Services and the Police Department. The newly renovated space will add 1,821 ASF of office and office service space to the campus. The inactive areas in OE 2 on the second floor, totaling 981 ASF, will be removed when the building is demolished and replaced with a new Emergency Services building.

2. Lecture – Per the State standards of utilizing a lecture room 53 hours per week, Crafton Hills College does not require additional classrooms. The projected campus ASF indicates that 3,163 ASF of lecture should be removed. Due to the fact that the campus has noted a need for medium-sized classrooms and that many of the classrooms cannot be reconfigured or adequately upgraded to “smart” classrooms due to construction constraints, the following strategy will be employed for 2012: 1) Inadequate lecture spaces will be converted to other uses where possible, and 2) New classrooms will be built that meet new technology standards. This strategy will ensure that there is no lecture growth by 2012, and future plans for build-out by 2025 will meet the State guidelines. It is important to note that all lecture ASF projections are based on utilizing lecture rooms on average of 53 hours per week.

3. Laboratory – Per the State Standards of utilizing labs 27.5 hours per week, CHC will require 11,721 ASF of new lab space. The majority of this lab space should be configured into medium-sized rooms that can seat 40-55 students. The disciplines that are projected to have the most growth and thus need for this space are Mathematics, Computer & Information Science, Health Science, and the Humanities - primarily Interdisciplinary Studies (such as pre-college courses for general education/basic skills).

4. Office/Conference – Per the State Standards, CHC does not require additional offices. The projected campus growth for 2012 indicates that the campus should remove 3,481 ASF of offices. It is unrealistic to recommend that CHC remove offices, particularly when the college has cited a need for more offices for full-time faculty and future staff and that no part-time offices exist on campus. While the existing office spaces on campus should be studied for possible reconfigurations to increase the efficiencies within the constraints of the building structure, it will be necessary to add more offices by 2012. As mentioned above, a portion of the inactive area will be converted to offices space for Administrative Services and the Police Department in the Lab/Administration Building, which will free up some space on the second and third floor of the Lab/Admin Building. A majority of the Classroom Building, whose small, dark classrooms are a source of complaint for the campus, will be converted into the Student Services Functions of Financial Aid, EOPS, and Health Services – a large portion of which will be offices. New construction will also add offices. CHC will be overbuilt in offices

for a period of time, but this allows the space for programs to grow and develop, attracting more students and in turn, allowing more office space on the campus to be built

5. Library – The existing library functions of Reading Study Rooms, Open Stacks/Reading Rooms and Processing Rooms will expand by 5,000 ASF in the new LRC, for a total of 18,000 ASF.

6. Physical Education (Indoor) – CHC is allowed by the State to have up to 35,000 ASF of indoor Physical Education. By 2012, only 4,900 ASF will be added to the campus in the form of the Community Recreational Facility (natatorium) to service the new Olympic Pool. The remaining allotted ASF will be included in the future Wellness Center.

7. Instructional Media (AV/TV) – Per the Educational Plan's recommendations, CHC will add 6,163 ASF of Instructional Media (AV/TV) space to the campus. Per the Final Project Proposal for the LRC, 4,460 ASF of this total will be included in the new LRC. In general, this type of space will be instructional spaces that use high technology such as distance learning labs. It will be distributed among the various clusters to activate hot spots.

8. Clinic/Demonstration – Clinic/Demonstration refers to the spaces used by Child Development for their day care facilities. The college expressed no immediate need for additional Clinic/Demonstration space by the year 2012.

9. Assembly/Exhibition – Per the State Standards, CHC does not require additional Assembly/Exhibition Space by 2012. However, this is a category that does not adversely affect the campus if more is added.

10. Food Service – Food Services is essential to create a campus center where students gather. To support the Master Plan goals of Student Life, dining will be relocated from the Campus Center on the edge of campus into the old Library, directly off of the Central Quad, creating the focal point for the new Student Center.

11. Lounge/Lounge Service – For 2012, there is no anticipated increase in Lounge/Lounge Service.

12. Merchandise Facility/Bookstore – The Bookstore will be located at the heart of campus with dining in the new Student Center. This will provide close proximity to both the future Student Services Cluster as well as the Parking Garage. These adjacencies will generate more student traffic than the Bookstore's current location between OE 1 and OE 2, on the "perceived" far end of campus.

13. Data Processing/Computers – With the ever increasing demand for technology to support teaching environments, Data Processing/Computers will expand significantly on the campus to provide the necessary support and infrastructure to meet the needs of the academic environment.

14. Physical Plant – For 2012, there is no anticipated increase in the Physical Plant, which refers to general storage.

15. Health Service – CHC is allowed by the state 1,200 ASF for Health Services. Because the Health Services department on campus not only serves the general student population but also the cadets in the EMS and Fire Academy programs who have demanding health service requirements, it is important for Health Services to expand to their capacity as soon as possible. The Health and Wellness Department require emergency vehicular access and prefer a central location for quick access to all areas of campus in the case of an emergency.

PROJECTIONS SUMMARY

Year	2005	2012	2018	2025
Student Enrollment*	5,400	7,150	9,300	11,470
Building Area (ASF)*	166,745	**195,662	242,296	**288,930
Parking Spaces	1,600	1,760	2,293	2,825

PROJECTED CAMPUS ASF GROWTH - 2005 to 2012

		Report 17 (2005)	7,150 Students (2012)*	Delta	
Room Use	Description	ASF	ASF	ASF	% Growth
000	Inactive Area	3,404	0	-3,404	-100%
100-115	Lecture	23,920	20,757	-3,163	-13%
210-255	Laboratory	35,343	47,064	11,721	33%
300-350	Office/Conference	22,837	19,356	-3,481	-15%
400-450	Library	20,611	25,566	4,955	24%
520-525	Physical Education (Indoor)	20,891	35,000	14,109	68%
530-535	Instructional Media (AV/TV)	722	6,885	6,163	854%
540-555	Clinic/Demonstration	4,103	6,000	1,897	46%
610-625	Assembly/Exhibition	9,995	7,150	-2,845	-28%
630-635	Food Service	5,756	4,290	-1,466	-25%
650-655	Lounge/Lounge Service	1,311	1,621	310	24%
660-665	Merchandise Facility/Bookstore	4,136	5,845	1,709	41%
670-690	Meeting/Recreation/Locker Rm.	1,600	2,381	781	49%
710-715	Data Processing/Comp	1,069	3,515	2,446	229%
720-740	Physical Plant	10,684	8,999	-1,685	-16%
800-870	Health Service	363	1,200	837	231%
	TOTAL	**166,745**	**195,629**	**28,884**	**17%**

PROJECTED CAMPUS ASF GROWTH - 2005 to 2025

		Report 17 (2005)	11,472 Students (2025)*	Delta	
Room Use	Description	ASF	ASF	ASF	% Growth
000	Inactive Area	3,404	0	-3,404	-100%
100-115	Lecture	23,920	33,418	9,498	40%
210-255	Laboratory	35,343	76,635	41,292	117%
300-350	Office/Conference	22,837	31,056	8,219	36%
400-450	Library	20,611	41,021	20,410	99%
520-525	Physical Education (Indoor)	20,891	35,000	14,109	68%
530-535	Instructional Media (AV/TV)	722	11,047	10,325	1430%
540-555	Clinic/Demonstration	4,103	6,000	1,897	46%
610-625	Assembly/Exhibition	9,995	11,472	1,477	15%
630-635	Food Service	5,756	6,883	1,127	20%
650-655	Lounge/Lounge Service	1,311	2,601	1,290	98%
660-665	Merchandise Facility/Bookstore	4,136	9,378	5,242	127%
670-690	Meeting/Recreation/Locker Rm.	1,600	3,821	2,221	139%
710-715	Data Processing/Comp	1,069	5,000	3,931	368%
720-740	Physical Plant	10,684	14,439	3,755	35%
800-870	Health Service	363	1,200	837	231%
	TOTAL	**166,745**	**288,971**	**122,226**	**73%**

* Figures based on Educational & Facilities Master Plan - October 2000 Draft and March 2005 Update.
** Figures assume lecture utilization of 53 hours/week and lab utilization of 27.5 hours/week.

LECTURE/ LAB ASF GROWTH

Lecture and lab spaces are vital to the functioning of a college. The assignable square footage (ASF) for both lecture and lab is tracked for each instructional discipline by TOPS code in order to understand the space a discipline uses. It is important to note that these numbers do not address the efficiency and functionality of the existing spaces, only the total area allotted for each type of space. Some disciplines primarily use lecture space for humanities-based courses, while others use primarily lab space for science-based courses. By comparing the existing lecture and lab ASF to the projected lecture and lab ASF for 7,150 and 11,472 students, the programs that grow the most and how much additional space they require can be determined.

For planning purposes, the disciplines are grouped by their academic cluster. Existing information for the individual department in Humanities was not available so only the total is provided. In 2012, the disciplines that will require additional space are Physical Science, Mathematics, Computer and Information Sciences, Interdisciplinary Studies, and Health Science. Increasing the utilization of the existing lecture and lab space, changing the use of existing space, or building new lecture and labs, will accommodate this growth. Negative growth indicates that the projections do not support the existing space a discipline occupies and that the current space is sufficient to meet their needs.

Of interest to note in the 2025 projections is that Biological Sciences will only require a relatively little amount of lecture space and no new lab space. The growth in the Science/Mathematics/BIT cluster will focus on lab spaces for Physical Science and Computer and Information Sciences and lecture spaces for Mathematics. The majority of the spaces in the Humanities cluster will be lecture for general Humanities and Social Science classes and labs for Interdisciplinary Studies. In the Emergency Services cluster, the main academic space will be labs.

PROJECTED LECTURE / LAB ASF GROWTH 2012

Discipline	TOPS Code	Existing*			7,150 Students (2012)*			Delta	
		Lec ASF	Lab ASF	Total ASF	Lec ASF	Lab ASF	Total ASF	ASF	% Growth
SCIENCE/MATH/BIT									
Biological Sciences	0400	0	11,461	11,461	1,089	5,396	6,486	-4,975	-43%
Physical Science	1900	0	4,420	4,420	900	7,335	8,235	3,815	86%
Mathematics	1700	2,542	0	2,542	3,516	1,238	4,753	2,211	87%
Business & Management	0500	1,089	4,715	5,804	1,289	1,162	2,451	-3,353	-58%
Computer & Information Sciences	0700	0	0	0	385	4,181	4,566	4,566	New
TOTAL		**3,631**	**20,596**	**24,227**	**7,179**	**19,312**	**26,491**	**2,264**	**9%**
HEALTH/PE									
Education	0800	420	38	458	120	0	120	-338	-74%
TOTAL		**420**	**38**	**458**	**120**	**0**	**120**	**-338**	**-74%**
FINE ARTS									
Fine & Applied Arts	1000	576	6,509	7,085	762	6,209	6,971	-114	-2%
TOTAL		**576**	**6,509**	**7,085**	**762**	**6,209**	**6,971**	**-114**	**-2%**
HUMANITIES		14,725	2,673	17,398					
Foreign Language	1100	0	0	0	977	1,032	2,009		
Humanities	1500	0	0	0	3,668	2,052	5,720		
Psychology	2000	0	0	0	1,166	195	1,361		
Social Sciences	2200	0	0	0	3,346	558	3,904		
Interdisciplinary Studies	4900	0	0	0	1,585	8,612	10,197		
TOTAL		**14,725**	**2,673**	**17,398**	**10,742**	**12,449**	**23,191**	**5,793**	**33%**
EMERGENCY SERVICES									
Health Science	1200	820	1,958	2,778	630	6,653	7,283	4,505	162%
Public Affairs/Services	2100	3,759	2,050	5,809	944	1,066	2,009	-3,800	-65%
TOTAL		**4,579**	**4,008**	**8,587**	**1,574**	**7,719**	**9,292**	**705**	**8%**
CDC									
Consumer Education/Home Economics	1300	0	0	0	380	1,375	1,755	1,755	New
TOTAL		**0**	**0**	**0**	**380**	**1,375**	**1,755**	**1,755**	**New**
CAMPUS TOTAL		**23,931**	**33,824**	**57,755**	**20,757**	**47,064**	**67,821**	**10,066**	**17%**

*Figures based on Educational & Facilities Master Plan - October 2000 Draft and March 2005 Update.

PROJECTED LECTURE / LAB ASF GROWTH 2025

Discipline	TOPS Code	Existing*			11,472 Students (2025)*			Delta	
		Lec ASF	Lab ASF	Total ASF	Lec ASF	Lab ASF	Total ASF	ASF	% Growth
SCIENCE/MATH/BIT									
Biological Sciences	0400	0	11,461	11,461	1,901	11,447	13,348	1,887	16%
Physical Science	1900	0	4,420	4,420	1,379	11,244	12,623	8,203	186%
Mathematics	1700	2,542	0	2,542	5,171	1,823	6,994	4,452	175%
Business & Management	0500	1,089	4,715	5,804	2,231	2,012	4,243	-1,561	-27%
Computer & Information Sciences	0700	0	0	0	689	7,471	8,160	8,160	
TOTAL		**3,631**	**20,596**	**24,227**	**11,371**	**33,997**	**45,368**	**21,141**	**87%**
HEALTH/PE									
Education	0800	420	38	458	190	0	190	-268	-59%
TOTAL		**420**	**38**	**458**	**190**	**0**	**190**	**-268**	**-59%**
FINE ARTS									
Fine & Applied Arts	1000	576	6,509	7,085	1,064	8,671	9,735	2,650	37%
TOTAL		**576**	**6,509**	**7,085**	**1,064**	**8,671**	**9,735**	**2,650**	**37%**
HUMANITIES		14,725	2,673	17,398					
Foreign Language	1100	0	0	0	1,156	1,221	2,377		
Humanities	1500	0	0	0	5,666	3,171	8,837		
Psychology	2000	0	0	0	2,256	378	2,634		
Social Sciences	2200	0	0	0	6,123	1,023	7,146		
Interdisciplinary Studies	4900	0	0	0	2,454	13,338	15,792		
TOTAL		**14,725**	**2,673**	**17,398**	**17,655**	**19,131**	**36,786**	**19,388**	**111%**
EMERGENCY SERVICES									
Health Science	1200	820	1,958	2,778	1,030	10,875	11,905	9,127	329%
Public Affairs/Services	2100	3,759	2,050	5,809	1,476	1,669	3,145	-2,664	-46%
TOTAL		**4,579**	**4,008**	**8,587**	**2,506**	**12,544**	**15,050**	**6,463**	**75%**
CDC									
Consumer Education/Home Economics	1300	0	0	0	632	2,292	2,924	2,924	
TOTAL		**0**	**0**	**0**	**632**	**2,292**	**2,924**	**2,924**	
CAMPUS TOTAL		**23,931**	**33,824**	**57,755**	**33,418**	**76,635**	**110,053**	**52,298**	**91%**

*Figures based on Educational & Facilities Master Plan - October 2000 Draft and March 2005 Update.

LECTURE/ LAB UTILIZATION

Title 5 of the California Administrative Code (Sections 57000-57140) prescribes standards for the utilization and planning of most educational facilities in public community colleges. These standards, when applied to the total number of students served (or some variant therof, e.g., weekly student contact hours), produce total capacity requirements that are expressed in assignable square feet (space available for assignment to occupants). To determine both existing and future capacity, lecture rooms should be utilized an average of 53 hours per week and labs should be utilized an average of 27.5 hours per week.

CHC class schedules for the spring of 2005 (labs) and fall 2005 (lectures) were analyzed to determine the current average utilization of the teaching spaces. The existing 29 lecture spaces on campus were utilized an average of 35 hours per week and the exiting 19 lab spaces on campus were utilized an average of 22 hours per week.

Increasing the number of hours a week a lecture or lab is used effectively increases the amount of teaching space available without having to build new space on campus. If CHC increased its utilization on average to 53 hours per week, the current hours spent teaching could be accommodated in 19 rooms, leaving 10 rooms open for additional classes. If CHC increased the lab utilization on average to 27.5 hours per week, the hours that are currently taught could be accommodated in 15 rooms, leaving 4 rooms open for additional lab classes.

It is recommended that at a minimum, CHC increase its lecture utilization to 44 hours per week. All of the lecture ASF projections and consequently the overall size of the Master Program, are based on the State standards of 53 hours per week.

LECTURE UTILIZATION

Building	Room	Capacity: Report 17	Capacity: State 15 SF/Per	Capacity: Code 20 SF/per	Capacity: Actual***	Lec ASF	Lec Hrs/Wk	Target Hours: Hrs < 35/wk	Target Hours: Hrs < 44/wk	Target Hours: Hrs < **53/wk
01 Lab/Admin										
	LADM 121	84	N/A	N/A	84	1,133	27	8	17	26
	*LADM 224	72	N/A	N/A	84	1,131	30	5	14	23
	LADM 304	51	63	47	49	941	39	-4	5	14
02 Library										
	LR 347	45	33	25	36	492	29	6	15	24
	LR 348	38	64	48	45	957	58	-23	-14	-5
05 Classroom Building										
	CL 106	45	42	31	47	625	43	-8	1	10
	*CL 107	30	25	19	23	372	24	12	21	30
	CL 108	34	25	19	27	371	28	7	16	25
	CL 109	34	25	19	28	374	44	-9	0	9
	CL 110	32	25	19	31	377	48	-13	-4	5
	CL 111	50	42	31	40	625	53	-18	-9	0
	CL 215	38	26	19	30	384	30	5	14	23
	CL 216	38	25	19	31	382	16	19	28	37
	CL 217	36	26	19	28	384	44	-9	0	9
	*CL 218	45	42	31	47	625	51	-16	-7	2
	CL 219	32	26	19	29	385	48	-13	-4	5
06 OE 1										
	OE1 120	30	56	42	43	836	40	-5	4	13
	OE1 127	60	56	42	52	836	40	-5	4	13
07 OE 2										
	OE2 205	50	101	76		1,510	6	29	38	47
	OE2 214C	40	52	39	34	774	36	-1	8	17
08 PAC										
	PAC 219	22	38	29		576	6	29	38	47
12 Chemistry/Health Science										
	CHS 122	66	N/A	N/A	69	1,118	24	11	20	29
	CHS 127	30	55	41	24	820	14	21	30	39
	*CHS 237	50	59	44	44	886	57	-22	-13	-4
	*CHS 242	68	N/A	N/A	68	1,126	33	2	11	20
13 Child Development 1										
	CD 115	52	53	40	40	792	35	0	9	18
18 BC										
	*BC 101	69	69	52	64	1,040	34	1	10	19
	BC 105	43	43	32	40	648	39	-4	5	14
	*BC 106	43	43	32	37	648	39	-4	5	14
TOTAL		**1,327**	**1,111**	**833**	**1,174**	**21,168**	**1,015**	**1**	**262**	**523**

Number of Rooms	29		
Average Capacity		46	
Average Hours/Week			35

	No. of Rooms	Available Rooms
Existing Lecture	29	0
Lecture Equivalent @ 35 Hours	29	0
Lecture Equivalent @ 44 Hours	23	6
Lecture Equivalent @ 53 Hours	19	10

Existing Extra Small Classrooms <35	8
Existing Small Classrooms 36-45	5
Existing Medium Classroom 46-55	10
Existing Large Classrooms >55	6

*Existing "Smart" Classroom converted by CHC.
**Master Program Lecture ASF projections are based on State Standard of 53 hours per week.
***Campus count of number of desks in classroom

LAB UTILIZATION

Building	Room	Lab CAP	Lab ASF	Lab Hrs/Wk	Target Hours Hrs < *27.5/wk
01 Lab/Admin					
	LADM 101	35	1,300	27	1
	LADM 106	20	1,177	21	7
	LADM 115	24	1,303	18	10
	LADM 201	27	1,170	21	7
	LADM 211	32	1,172	27	1
	LADM 216	30	1,063	3	25
	LADM 217	20	919	30	-2
	LADM 220	18	1,142	21	7
	LADM 225	45	1,340	24	4
06 OE 1					
	OE1 101	30	1,192	30	-3
07 OE 2					
	OE2 214A	19	722	6	22
	OE2 216	15	486	15	13
08 PAC					
	PAC 225	25	564	6	22
	PAC 308	60	1,465	55	-27
	PAC 309	56	1,465	29	-2
12 Chemistry/Health Science					
	CHS 123	45	1,687	22	6
	CHS 232	32	1,959	15	13
	CHS 238	32	1,959	15	13
18 BC					
	BC 104	19	772	34	-7
TOTAL		**584**	**22,857**	**418**	**105**

Number of Rooms	19			
Average Capacity		31		
Average Hours/Week				22

	No. of Rooms	Available Lab
Existing Lab	19	0
Lab Equivalent @ 27.5 Hours	15	4

*Master Program Lab ASF projections are based on State Standard of 27.5 hours per week.

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4 | MASTER PROGRAM PLAN

SUMMARY

By 2025, CHC will need to add 146,938 ASF / 268,702 GSF bringing the campus total to 313,683 ASF / 493,489 GSF. This total is 24,712 ASF more than the Educational Master Plan projection of 288,971 ASF. The delta includes 9,750 ASF for the Community Center, which does not count as assignable square footage on the Report 17, as well as growth for the Student Center and Student Services cluster. The last two items, while potentially not State supportable, are essential to the realization of the Master Plan Goals.

The target ASF for each cluster is calculated by combining the departmental 2025 ASF targets as shown in the "Space Use by Department Summary" in Section 2. While each department has individual growth needs, each academic cluster (Child Development & Education, Humanities, Fine Arts, Science/Mathematics/BIT, Emergency Services, and Health/Physical Education) has been assigned a Cluster Library, Cluster Instructional Media space, and Cluster Support. The intent is to provide shared spaces with adequate technical support, thereby creating unique and active "hot spots" within each cluster.

The cluster ASF target is distributed between renovated and/or new construction. It has been assumed that the efficiency of the renovated buildings will decrease based on the building constraints, changes of use, and the need to bring the buildings up to current code standards. All of the clusters will require new construction. The size of the new construction is the difference between the cluster target ASF and the total renovated ASF of the existing buildings in that cluster.

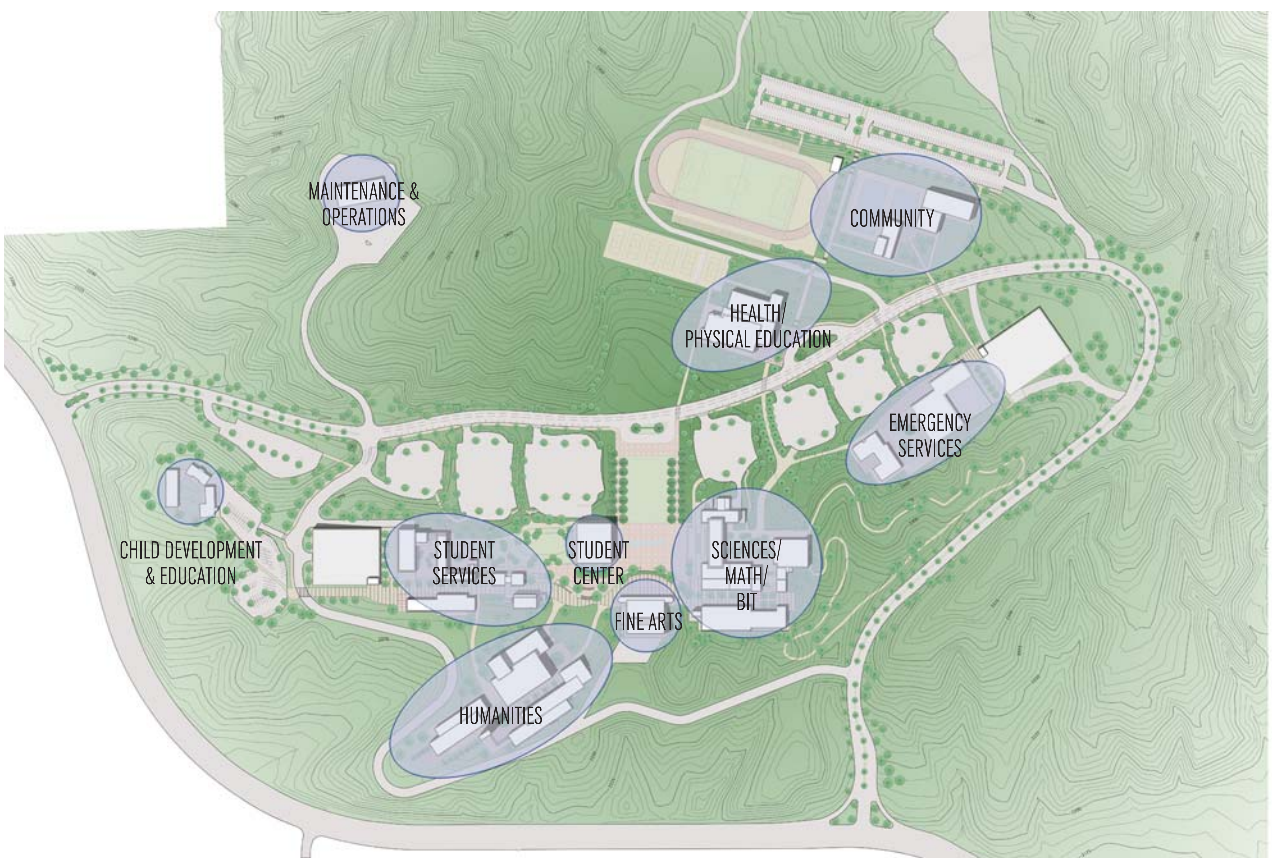
In the Humanities cluster, the size of the LRC is a given based on the Final Project Proposal submitted to the State. Humanities 1 is sized to provide enough new classroom space of the desired quality on campus to help reach the student enrollment target but not be too large as to jeopardize future State funding. The size of Humanities 2 completes the cluster ASF target.

In the Community Cluster, the Community Recreational Facility is sized to support the Olympic swimming pool. If a warm-up pool is added in the future, the size of the building will need to increase to provide locker rooms, changing rooms, and public facilities that properly service the two pools.

CLUSTERS

Cluster	ASF	GSF
CHILD DEVELOPMENT & EDUCATION	12,549	20,168
STUDENT SERVICES	36,823	58,618
HUMANITIES	84,785	122,400
FINE ARTS	23,567	43,146
SCIENCE/MATH/BIT	52,175	83,951
EMERGENCY SERVICES	28,073	43,946
HEALTH / PHYSICAL EDUCATION	32,611	48,075
COMMUNITY	14,650	22,000
STUDENT CENTER	25,915	37,021
MAINTENANCE AND OPERATIONS	10,000	14,286
CAMPUS TOTAL	**321,148**	**493,611**
EXISTING CAMPUS TOTAL*	**166,745**	**224,787**
TOTAL ADDED SPACE	**154,403**	**268,824**

*Existing per Report 17 (March 2005)



CHILD DEVELOPMENT & EDUCATION CLUSTER

Child Development & Education	12,549	ASF
TARGET	**12,549**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
13 Child Development 1		3,083	2,940	60%	4,900
14 Child Development 2		1,746	1,733	55%	3,150
Subtotal Renovation			4,673		8,050
NEW CONSTRUCTION					
15 Child Development Expansion	7,877			65%	12,118
Subtotal New Projects	7,877				12,118
CLUSTER TOTAL	**12,549**				**20,168**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

STUDENT SERVICES CLUSTER

Administration	10,000	ASF
Swing Space	10,533	ASF
Student Services	16,290	ASF
TARGET	**36,823**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
03 College Center		8,245	7,276	85%	8,560
04 Student Services A		4,773	3,490	35%	9,970
05 Classroom Building		5,816	4,420	65%	6,800
16 Student Services B		4,194	3,624	65%	5,575
Subtotal Renovation			18,809		30,905
NEW CONSTRUCTION					
19 Administration/Student Services	18,014			65%	27,713
Subtotal New Projects	18,014				27,713
CLUSTER TOTAL	**36,823**				**58,618**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

HUMANITIES CLUSTER

General Assignment	30,101	ASF
Language Arts	5,673	ASF
Learning Center	0	ASF
Library	40,000	ASF
Social Sciences	7,778	ASF
Technical Services	1,233	ASF
TARGET	**84,785**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*	
NEW CONSTRUCTION						
20 Learning Resource Center (LRC)	40,000			75%	53,500	Per FPP
21 Humanities 1	15,840			65%	24,369	
22 Humanities 2	28,945			65%	44,531	
Subtotal New Projects	84,785				122,400	
CLUSTER TOTAL	**84,785**				**122,400**	

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

FINE ARTS CLUSTER

Fine Arts	23,567	ASF
TARGET	**23,567**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
08 Performing Arts Center		15,736	14,926	50%	29,851
Subtotal Renovation			14,926		29,851
NEW CONSTRUCTION					
23 PAC Expansion	8,642			65%	13,295
Subtotal New Projects	8,642				13,295
CLUSTER TOTAL	**23,567**				**43,146**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

SCIENCE/MATH/BIT CLUSTER

Biological Sciences & Chemistry	13,968	ASF
Business and Information Tech	13,024	ASF
Math	11,083	ASF
Physcial Science	13,001	ASF
Police	1,099	
TARGET	**52,175**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
01 Lab/Admin		25,784	18,373	60%	30,621
12 Chemistry		12,776	10,343	60%	17,238
Subtotal Renovation			28,715		47,859
NEW CONSTRUCTION					
24 Sciences	23,460			65%	36,092
Subtotal New Projects	23,460				36,092
CLUSTER TOTAL	**52,175**				**83,951**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

EMERGENCY SERVICES CLUSTER

Allied Health Services	3,412	ASF
Emergency Services	24,661	ASF
TARGET	**28,073**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
06 OE 1		7,719	5,905	60%	9,842
Subtotal Renovation			5,905		9,842
NEW CONSTRUCTION					
07 Emergency Services	22,168			65%	34,104
Subtotal New Projects	22,168				34,104
CLUSTER TOTAL	**28,073**				**43,946**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

HEALTH / PHYSICAL EDUCATION CLUSTER

Health & Physical Education 32,611 ASF

TARGET 32,611 ASF

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
RENOVATION					
10 Gymnasium		22,428	16,520	70%	23,600
Subtotal Renovation			16,520		23,600
NEW CONSTRUCTION					
11 Wellness Center	13,536			65%	24,475
Subtotal New Projects	13,536				24,475
CLUSTER TOTAL	**30,056**				**48,075**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

***Community Center is part of the Community Recreational Facility and will not count towards the Report 17.

COMMUNITY CLUSTER

Health & Physical Education 4,900 ASF

TARGET 4,900 ASF

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
NEW CONSTRUCTION					
25 Community Recreational Facility***	4,900			70%	7,000
26 Community Center****	9,750			65%	15,000
Subtotal New Projects	14,650				22,000
CLUSTER TOTAL	**14,650**				**22,000**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

***Natatorium

****Community Center is part of the Community Cluster and will not count towards the Report 17.

STUDENT CENTER

Dining	7,465	ASF
Bookstore	10,500	ASF
Student Center	5,500	ASF
Other	2,450	ASF
TARGET	**25,915**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
NEW CONSTRUCTION					
02 Student Center	25,915			70%	37,021
Subtotal New Projects	25,915				37,021
CLUSTER TOTAL	**25,915**				**37,021**

MAINTENANCE AND OPERATIONS

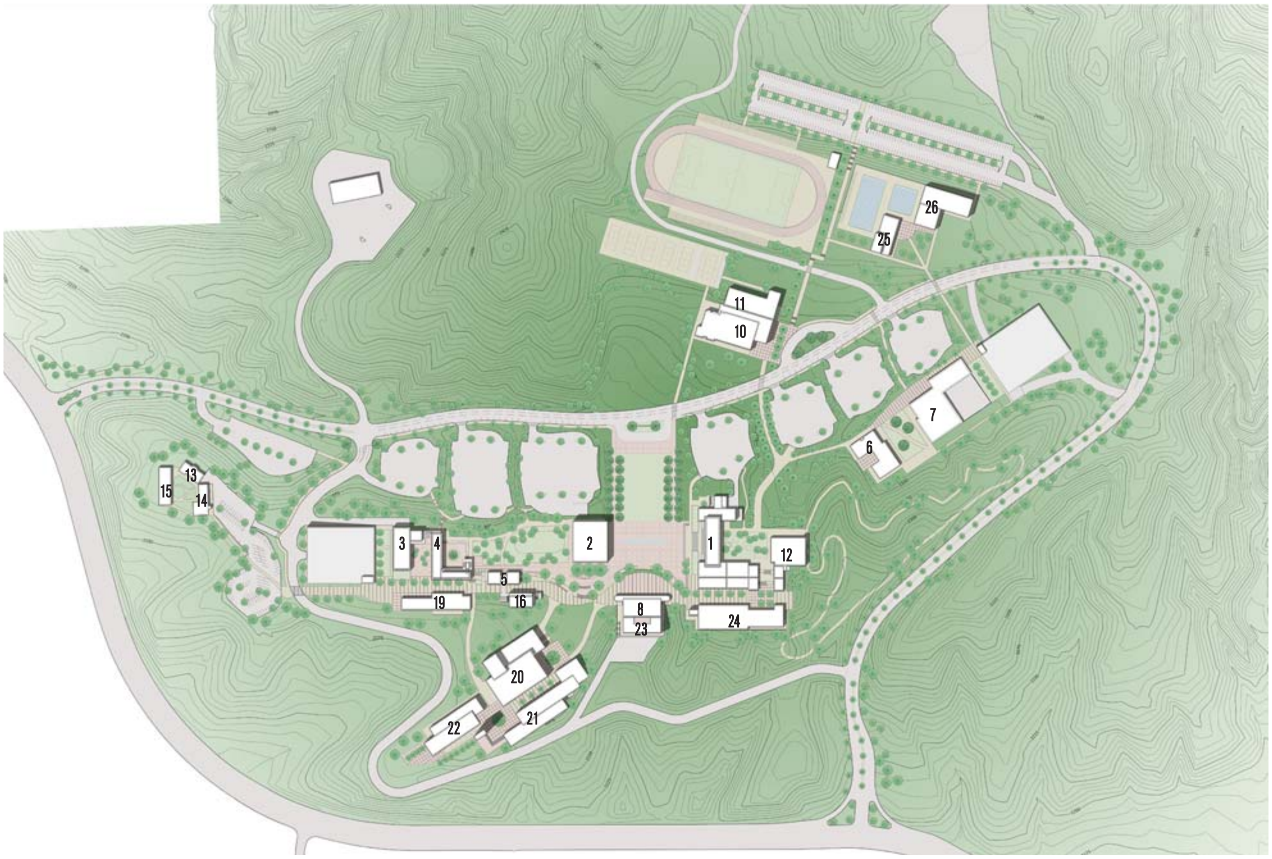
Maintenance & Operations	10,000	ASF
TARGET	**10,000**	**ASF**

Building	(N) ASF	(E) ASF*	Renovated ASF**	% Efficiency	GSF*
NEW CONSTRUCTION					
Maintenance & Operations	10,000			70%	14,286
Subtotal New Projects	10,000				14,286
CLUSTER TOTAL	**10,000**				**14,286**

*Existing per Report 17 (March 2005)

**Renovated ASF assumes lower efficiency factor due to building constraints or change of use.

2025 MASTER PLAN



NO.	BUILDING NAME	NO.	BUILDING NAME
1	LABORATORY CENTER (former Laboratory/Administration Building)	13	CHILD DEVELOPMENT CENTER 1
2	**STUDENT CENTER**	14	CHILD DEVELOPMENT CENTER 2
3	COLLEGE CENTER	**15**	**CHILD DEVELOPMENT CENTER EXPANSION**
4	STUDENT SERVICES A	16	STUDENT SERVICES B
5	STUDENT SERVICES C (former Classroom Building)	17	DEMOLISHED - CLASSROOMS
		18	DEMOLISHED - CLASSROOMS
		19	**ADMINISTRATION/ STUDENT SERVICES**
6	OCCUPATIONAL EDUCATION 1	**20**	**LEARNING RESOURCE CENTER**
7	EMERGENCY SERVICES	**21**	**HUMANITIES 1**
8	PERFORMING ARTS CENTER	**22**	**HUMANITIES 2**
9	**MAINTENANCE & OPERATIONS**	**23**	**PERFORMING ARTS CENTER EXPANSION**
10	GYMNASIUM	**24**	**SCIENCES**
11	**WELLNESS CENTER**	**25**	**COMMUNITY RECREATIONAL FACILITY**
12	CHEMISTRY	**26**	**COMMUNITY CENTER**

* 2012 & 2025 new buildings are indicated by bold font.

5 | SPACE STANDARDS

SUMMARY

Sizes for lecture, computer labs, offices, and conference rooms have been programmed to provide a standard for future renovation and construction. All lecture and lab spaces are "smart" classrooms. The small (810 ASF) and medium (1,080 ASF) lecture and labs have been designed for maximum flexibility in furniture arrangement and spatial reconfiguration. Two medium lecture or labs can be converted to three small lecture or labs and vice versa. CHC requested two (2) large lecture rooms (1,500 ASF), one in the Humanities cluster and one in the Science/Mathematics/BIT cluster, and one (1) extra-large lecture (2,500 ASF), location to be determined.

SPACE STANDARDS

LECTURE

Room Type	ASF
110 Small Lecture	810
110 Medium Lecture	1,080
110 Large Lecture	1,500
110 Extra Large Lecture	2,500

COMPUTER LAB

Room Type	ASF
210 Small Lab	810
210 Medium Lab	1,080
210 Large Lab	1,500

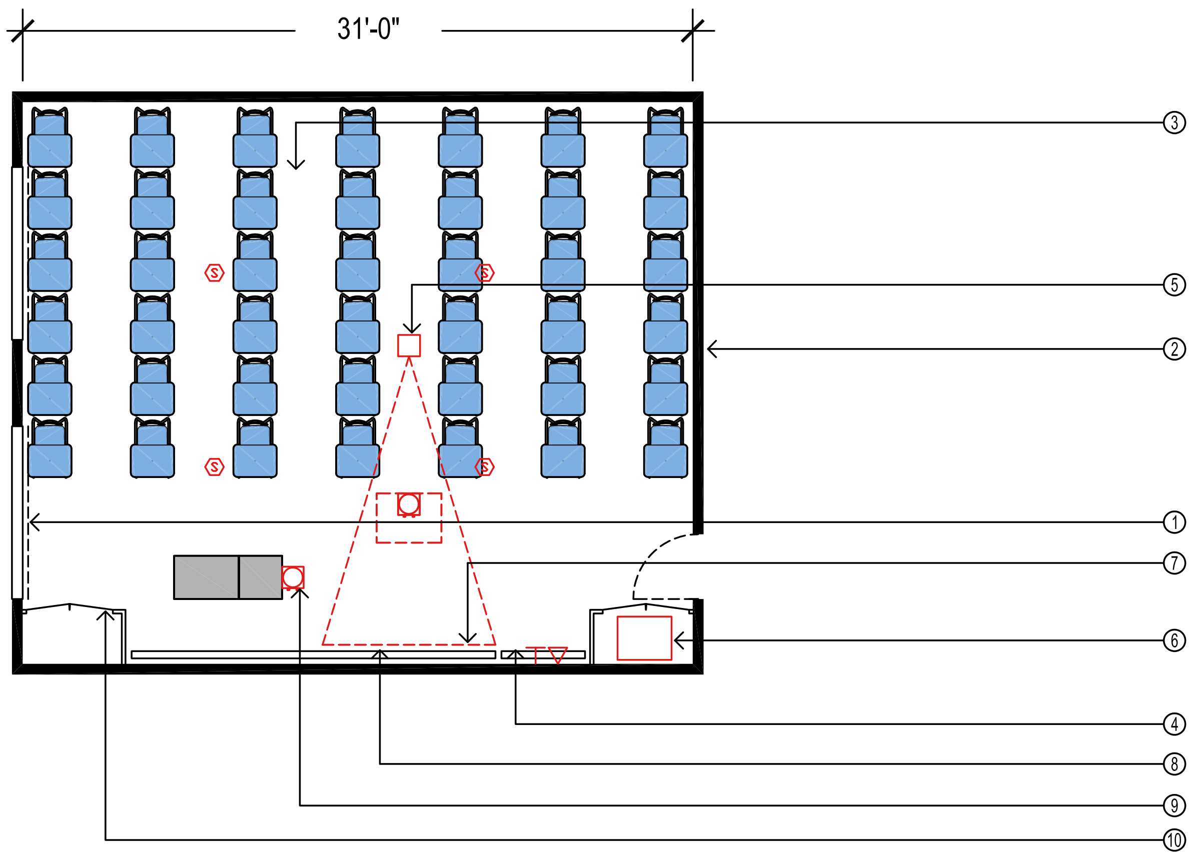
OFFICE

Room Type	ASF
310 Open Work Station	60
310 Staff	80
310 Full-time Faculty	90
310 Counselor	100
310 Part-time Faculty - Small (2 people)	120
310 Part-time Faculty - Large (4 people)	240
310 Associate Dean	140
310 Dean	160
310 Vice President	240
310 President	300

CONFERENCE

Room Type	ASF
350 Small Conference	120
350 Medium Conference	300
350 Large Conference	375

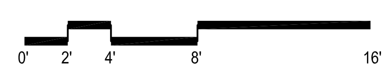
SMALL LECTURE A (42 STUDENT STATIONS AT 18 SF/STATION: 810 SF)



LEGEND

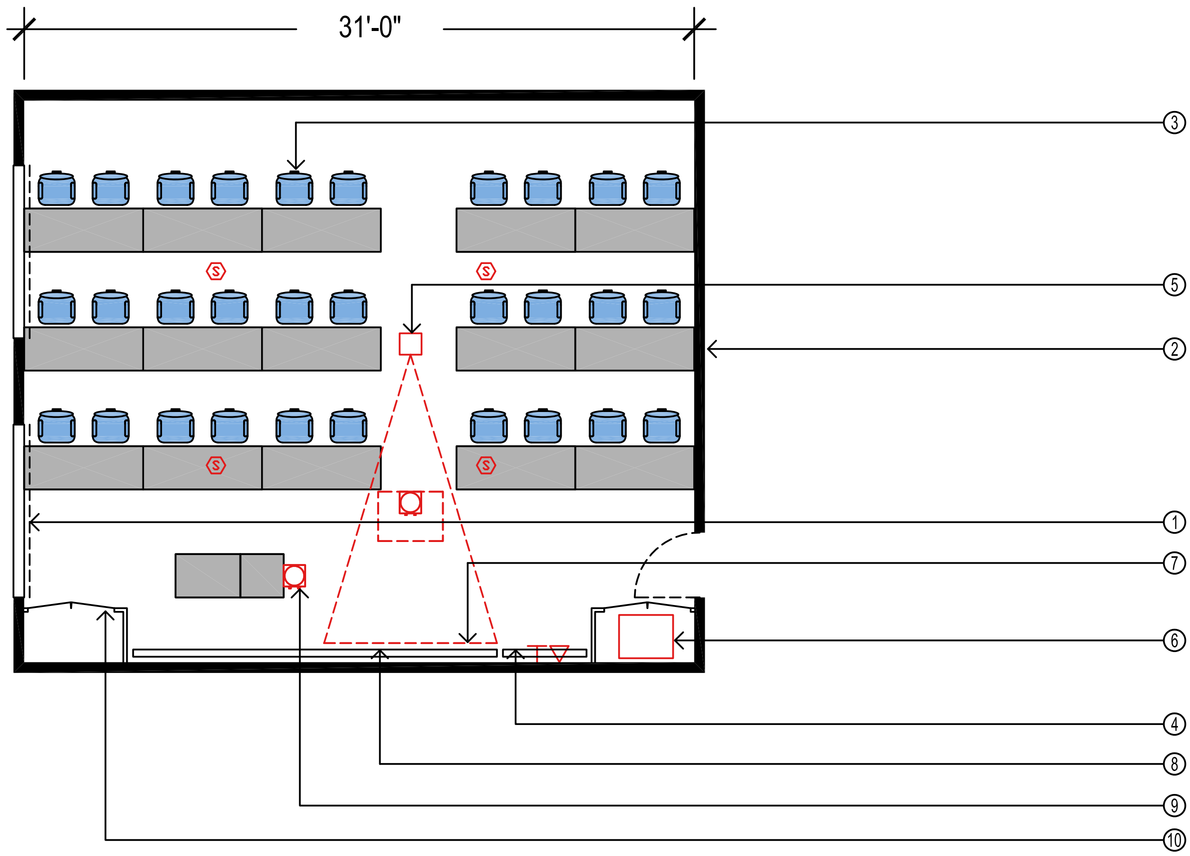
1. SHADES AT EXTERNAL WINDOWS
2. POWER AND NETWORK CONNECTION AT EACH ROW
3. OPTIONAL INSTRUCTOR STATION
4. BULLETIN BOARD
5. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
6. PRINTER STATION
6. AUDIO VISUAL EQUIPMENT RACK
7. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
8. WHITEBOARD
9. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
10. LOCKABLE STORAGE CABINET

- S — CEILING SPEAKERS
- FLOOR BOX
- SCREEN CONTROL
- MICROPHONE RECEIVER



NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

SMALL LECTURE B (30 STUDENT STATIONS AT 27 SF/STATION: 810 SF)



LEGEND

1. SHADES AT EXTERNAL WINDOWS
2. POWER AND NETWORK CONNECTION AT EACH ROW
3. OPTIONAL INSTRUCTOR STATION
4. BULLETIN BOARD
5. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
6. AUDIO VISUAL EQUIPMENT RACK
7. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
8. WHITEBOARD
9. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
10. LOCKABLE STORAGE CABINET

CEILING SPEAKERS

FLOOR BOX

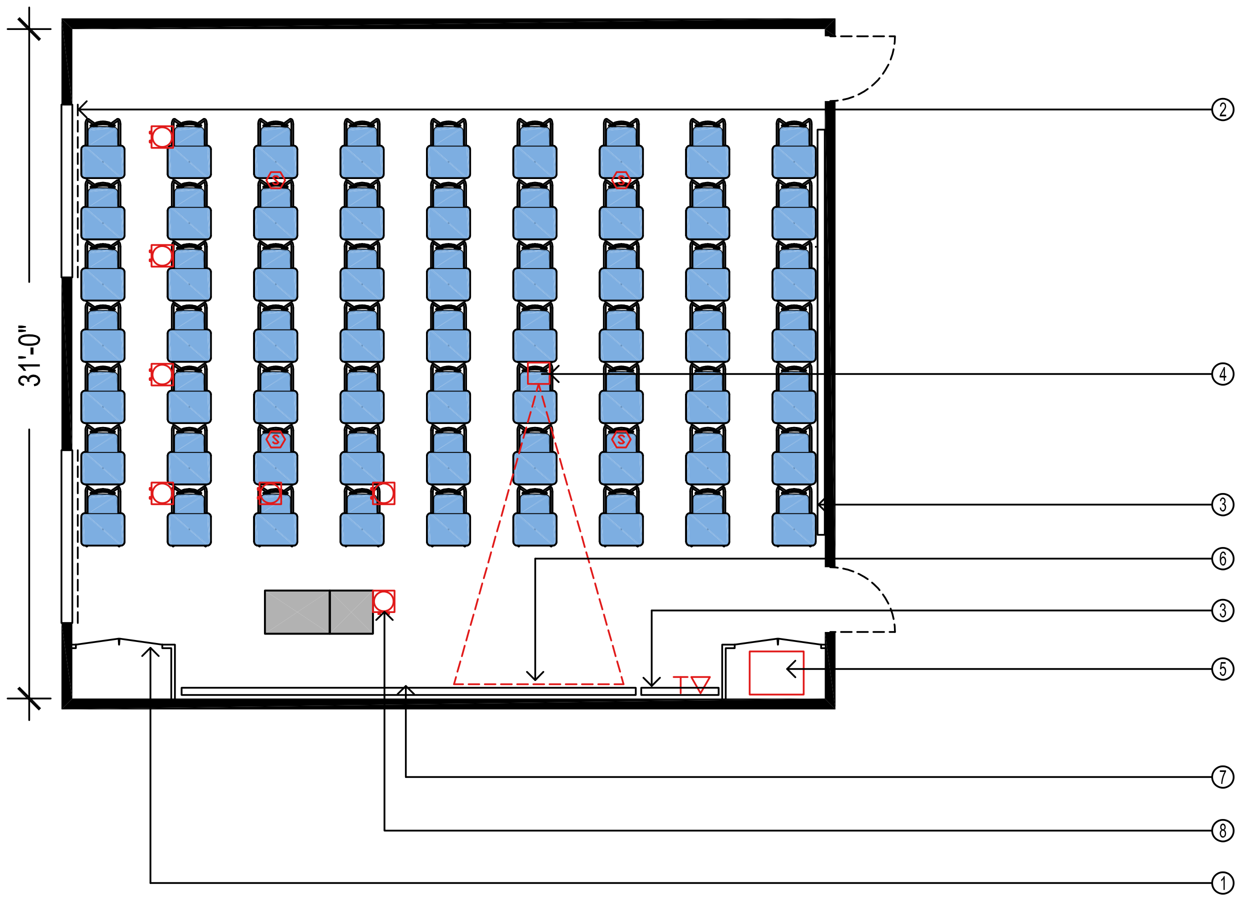
SCREEN CONTROL

MICROPHONE RECEIVER

0' 2' 4' 8' 16'

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

MEDIUM LECTURE A (60 STUDENT STATIONS AT 18 SF/STATION: 1,080 SF)



LEGEND

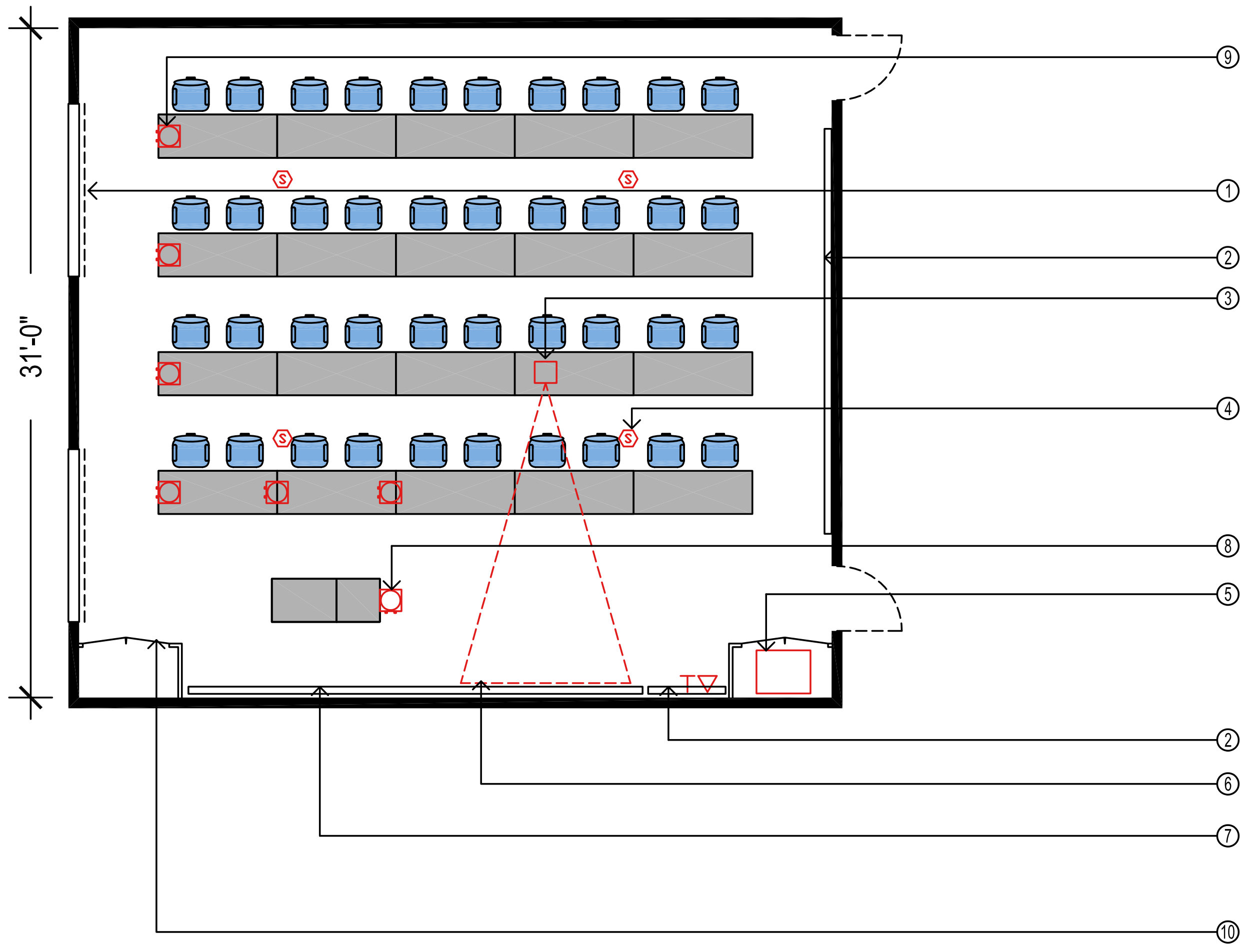
1. LOCKABLE STORAGE CABINET
2. SHADES AT EXTERNAL WINDOWS
3. BULLETIN BOARD
4. CEILING MOUNTED VIDEO/DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
5. AUDIO VISUAL EQUIPMENT RACK
6. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
7. WHITEBOARD
8. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY

CEILING SPEAKERS
FLOOR BOX
SCREEN CONTROL
MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

0' 2' 4' 8' 16'

MEDIUM LECTURE B (40 STUDENT STATIONS AT 27 SF/STATION: 1,080 SF)

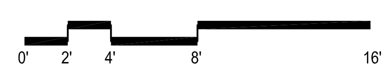


LEGEND

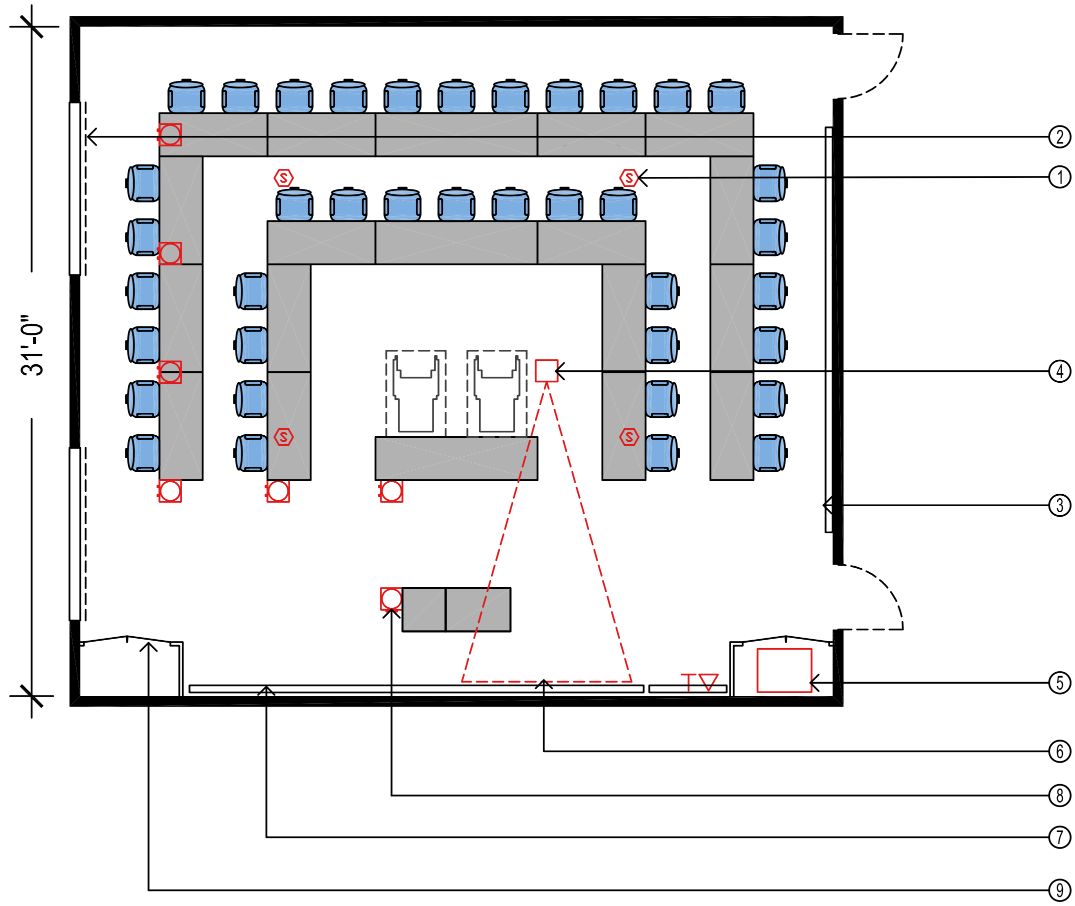
1. SHADES AT EXTERNAL WINDOWS
2. BULLETIN BOARD
3. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
4. CEILING LOUDSPEAKERS
5. AUDIO VISUAL EQUIPMENT RACK
6. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
7. WHITEBOARD
8. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
9. POWER AND NETWORK CONNECTION IN FLUSH FLOOR BOX
10. LOCKABLE STORAGE CABINET

CEILING SPEAKERS
FLOOR BOX
SCREEN CONTROL
MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD



MEDIUM LECTURE C (40 STUDENT STATIONS AT 27 SF/STATION: 1,080 SF)



LEGEND

1. CEILING LOUDSPEAKERS
2. BLACKOUT SHADES AT EXTERNAL WINDOWS
3. BULLETIN BOARD
4. VIDEO/DATA PROJECTION WITH NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
5. AUDIO VISUAL EQUIPMENT RACK CONCEALED WITHIN CASEWORK (DATA/NETWORK CONNECTIVITY)
6. PROJECTION SCREEN 4'-6" X 8'-0"
7. WHITEBOARD
8. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
9. LOCKABLE STORAGE CABINET

CEILING SPEAKERS

FLOOR BOX

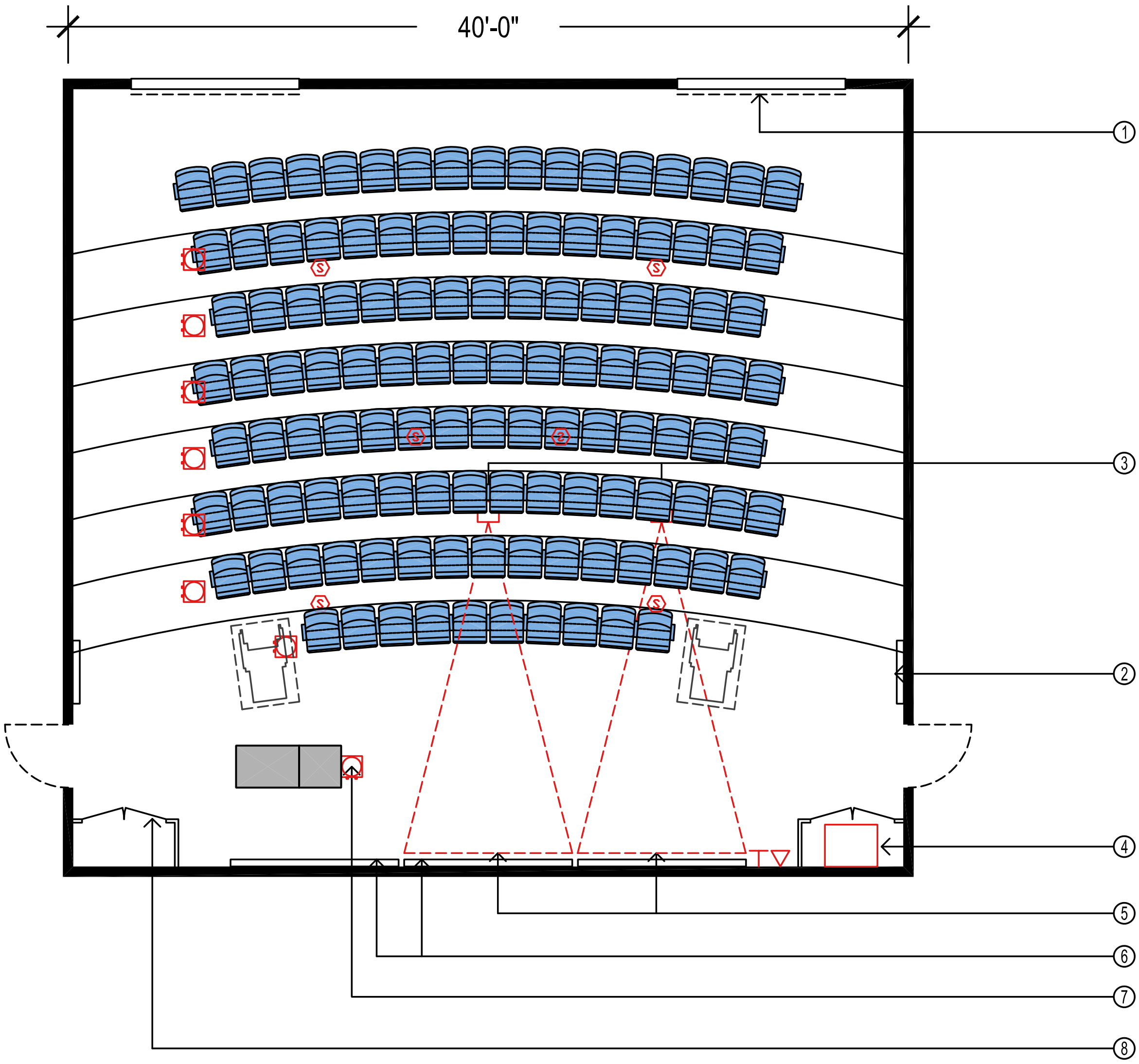
SCREEN CONTROL

MICROPHONE RECEIVER

0' 2' 4' 8' 16'

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

LARGE LECTURE A (120 STUDENT STATIONS AT 12.5 SF/STATION: 1,500 SF)



LEGEND

1. BLACKOUT SHADES AT EXTERNAL WINDOWS
2. BULLETIN BOARD
3. CEILING MOUNTED VIDEO/DATA PROJECTOR WITH NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
4. AUDIO VISUAL EQUIPMENT RACK CONCEALED WITHIN CASEWORK (DATA/NETWORK CONNECTIVITY)
5. POWER RETRACTABLE PROJECTION SCREEN 4'-6" X 8'-0"
6. WHITEBOARD
7. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
8. LOCKABLE STORAGE CABINET

CEILING SPEAKERS

FLOOR BOX

SCREEN CONTROL

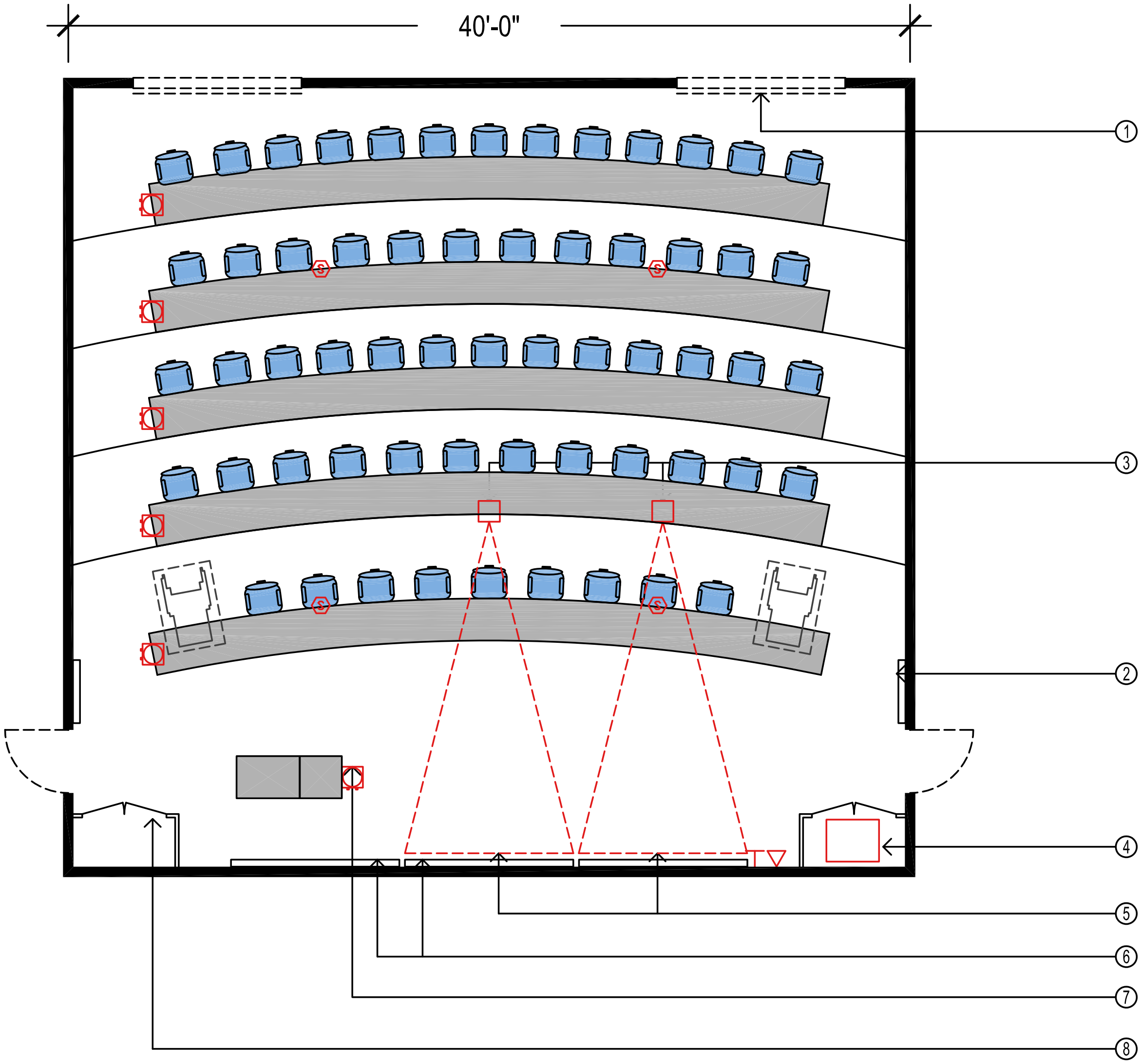
MICROPHONE RECEIVER

0' 2' 4' 8' 16'

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING; SEATING TIERS BUILT UP WITH DAMPENED METAL DECKS TO PROVIDE OPTION FOR FUTURE REMOVAL.

MULTIPLE LEVEL SLIDING WHITE BOARDS CAN BE UTILIZED IN LARGE LECTURE ROOMS

LARGE LECTURE B (61 STUDENT STATIONS AT 24.5 SF/STATION: 1,500 SF)



LEGEND

1. BLACKOUT SHADES AT EXTERNAL WINDOWS
2. BULLETIN BOARD
3. CEILING MOUNTED VIDEO/DATA PROJECTOR WITH NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
4. AUDIO VISUAL EQUIPMENT RACK CONCEALED WITHIN CASEWORK (DATA/NETWORK CONNECTIVITY)
5. POWER RETRACTABLE PROJECTION SCREEN 4'-6" X 8'-0"
6. WHITEBOARD
7. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
8. LOCKABLE STORAGE CABINET

S CEILING SPEAKERS

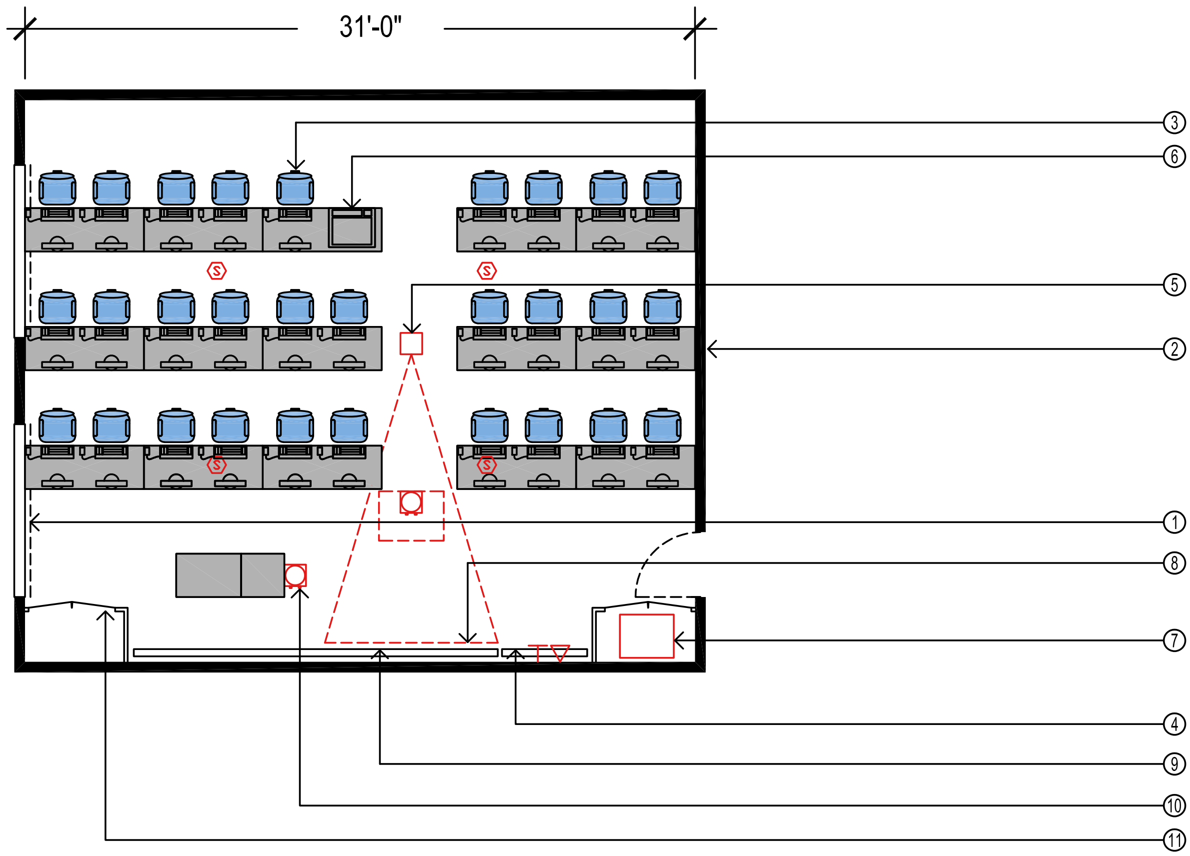
FLOOR BOX

SCREEN CONTROL

MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING; SEATING TIERS BUILT UP WITH DAMPENED METAL DECKS TO PROVIDE OPTION FOR FUTURE REMOVAL.
MULTIPLE LEVEL SLIDING WHITE BOARDS CAN BE UTILIZED IN LARGE LECTURE ROOMS

SMALL COMPUTER LAB (29 STUDENT STATIONS AT 27.9 SF/STATION: 810 SF)



LEGEND

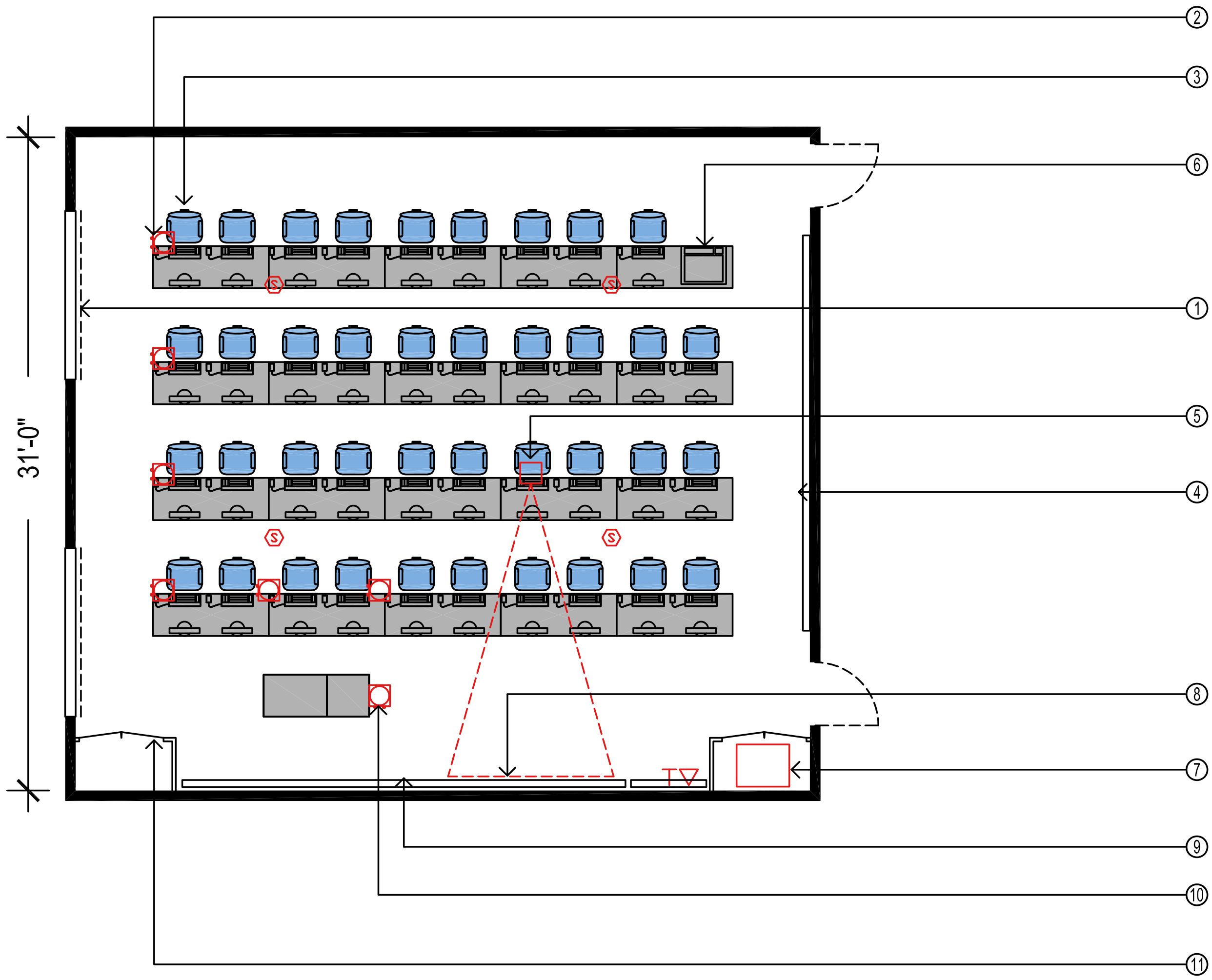
1. SHADES AT EXTERNAL WINDOWS
2. POWER AND NETWORK CONNECTION AT EACH ROW
3. OPTIONAL INSTRUCTOR STATION
4. BULLETIN BOARD
5. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
6. PRINTER STATION
7. AUDIO VISUAL EQUIPMENT RACK
8. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
9. WHITEBOARD
10. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
11. LOCKABLE STORAGE CABINET

CEILING SPEAKERS
FLOOR BOX
SCREEN CONTROL
MICROPHONE RECEIVER

0' 2' 4' 8' 16'

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

MEDIUM COMPUTER LAB A (39 STUDENT STATIONS AT 27 SF/STATION: 1,080 SF)

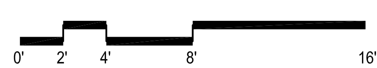


LEGEND

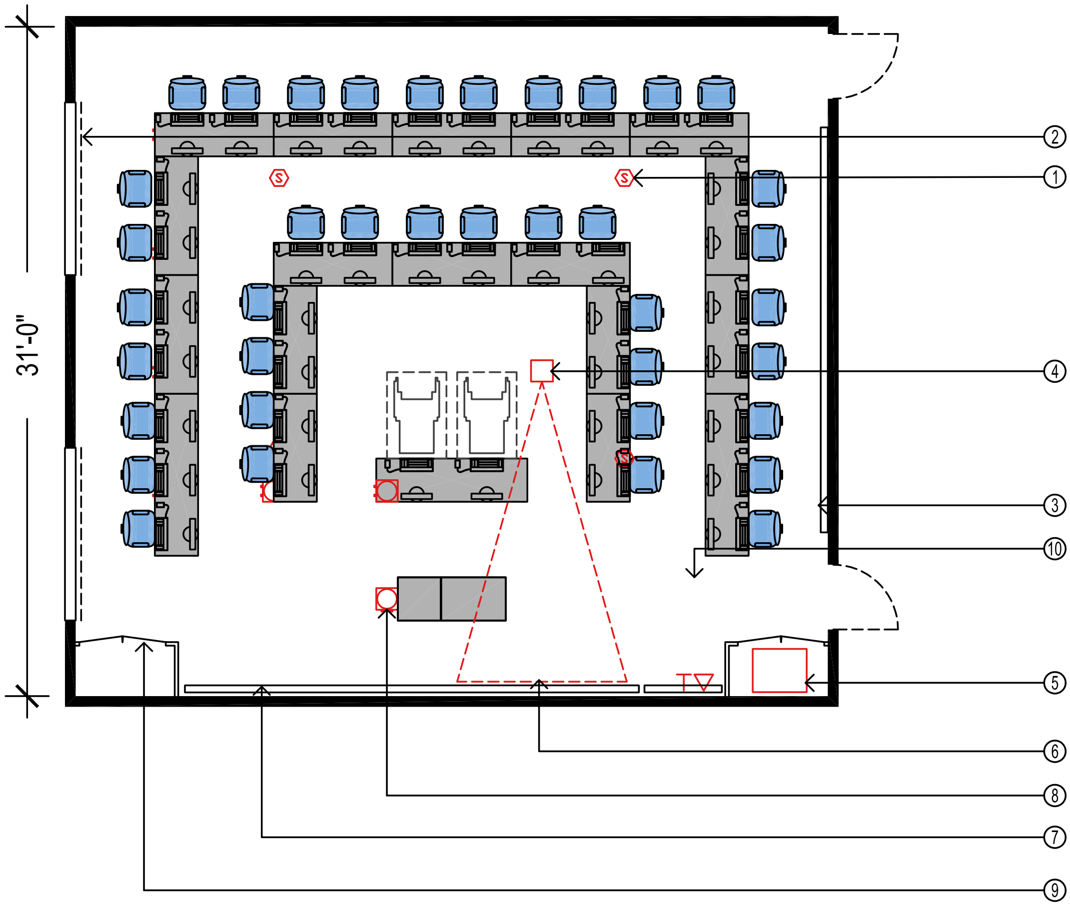
1. SHADES AT EXTERNAL WINDOWS
2. POWER AND NETWORK CONNECTION IN FLUSH FLOOR BOX AT EACH ROW
3. OPTIONAL INSTRUCTOR STATION
4. BULLETIN BOARD
5. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
6. PRINTER STATION
7. AUDIO VISUAL EQUIPMENT RACK
8. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
9. WHITEBOARD
10. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
11. LOCKABLE STORAGE CABINET

- CEILING SPEAKERS
- FLOOR BOX
- SCREEN CONTROL
- MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD



MEDIUM COMPUTER LAB B (40 STUDENT STATIONS AT 27 SF/STATION: 1,080 SF)



LEGEND

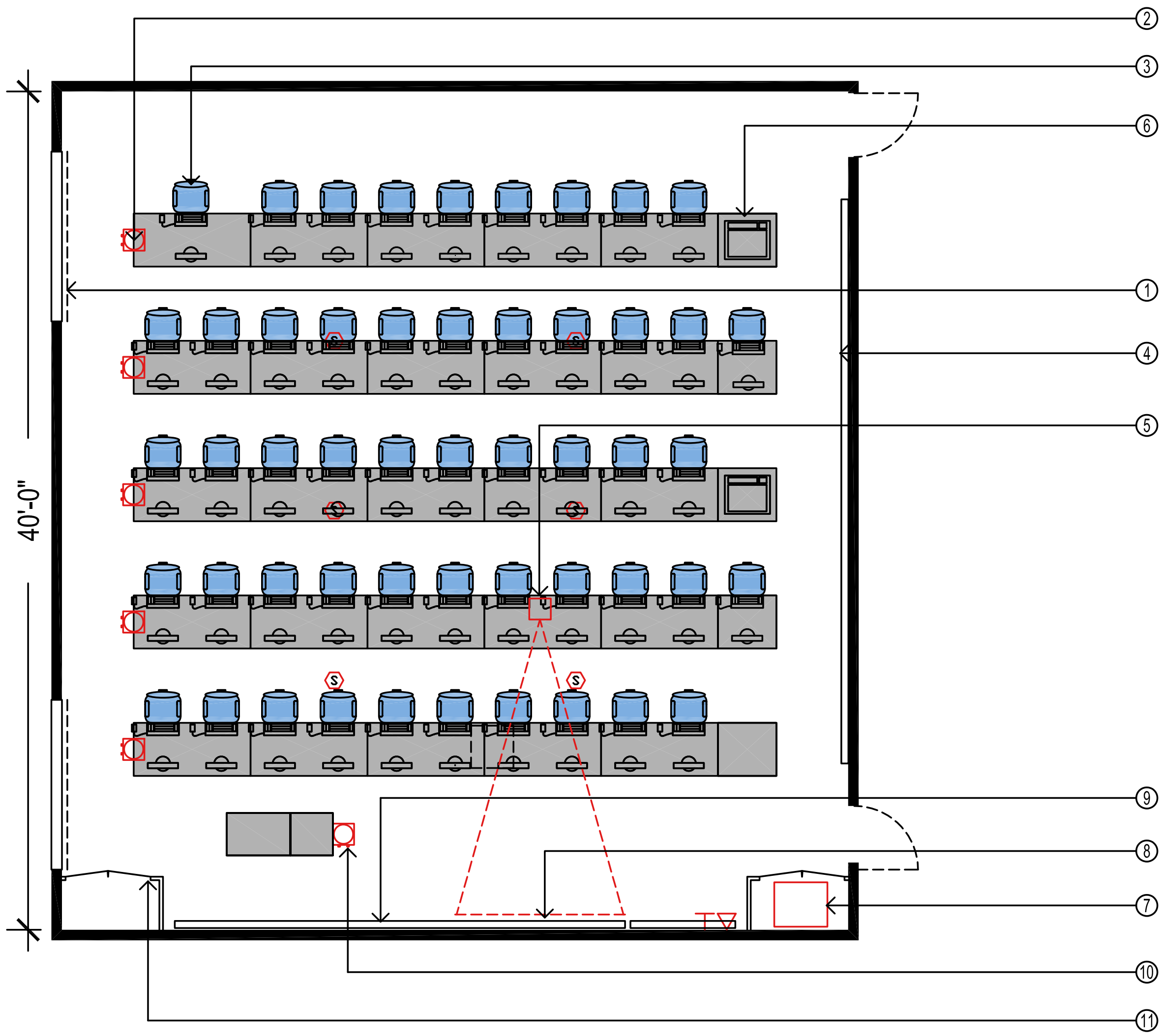
1. CEILING LOUDSPEAKERS
2. BLACKOUT SHADES AT EXTERNAL WINDOWS
3. BULLETIN BOARD
4. VIDEO/DATA PROJECTION WITH NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
5. AUDIO VISUAL EQUIPMENT RACK CONCEALED WITHIN CASEWORK (DATA/NETWORK CONNECTIVITY)
6. PROJECTION SCREEN 4'-6" X 8'-0"
7. WHITEBOARD
8. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
9. LOCKABLE STORAGE CABINET
10. REMOVABLE STAGE PLATFORM WITH ACCESS RAMP

CEILING SPEAKERS
FLOOR BOX
SCREEN CONTROL
MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING
BULLETIN BOARDS CAN BE MOVED TO SIDE OF CLASSROOM TO MAXIMIZE LENGTH OF WHITE BOARD

0' 2' 4' 8' 16'

LARGE COMPUTER LAB (50 STUDENT STATIONS AT 30 SF/STATION: 1,500 SF)



LEGEND

1. SHADES AT EXTERNAL WINDOWS
2. POWER AND NETWORK CONNECTION IN FLUSH FLOOR BOX AT EACH ROW
3. OPTIONAL INSTRUCTOR STATION
4. BULLETIN BOARD
5. CEILING-MOUNTED VIDEO-DATA PROJECTOR W/ NETWORK CONNECTIVITY (BUILT-IN READY TO UTILIZE)
6. PRINTER STATION
7. AUDIO VISUAL EQUIPMENT RACK
8. MOTORIZED PROJECTION SCREEN 4'-6" X 8'-0"
9. WHITEBOARD
10. FLUSH MOUNT AV / DATA FLOOR BOX FOR LECTERN CONNECTIVITY
11. LOCKABLE STORAGE CABINET

S CEILING SPEAKERS

FLOOR BOX

SCREEN CONTROL

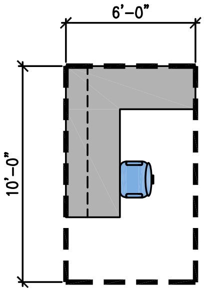
MICROPHONE RECEIVER

NOTE: ZONED LIGHTING WITH FRONT/BACK SWITCHING

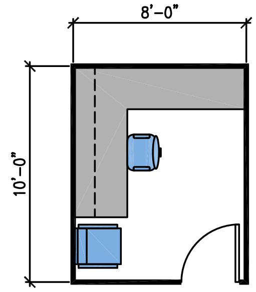
MULTIPLE LEVEL SLIDING WHITE BOARDS CAN BE UTILIZED IN LARGE LECTURE ROOMS

0' 2' 4' 8' 16'

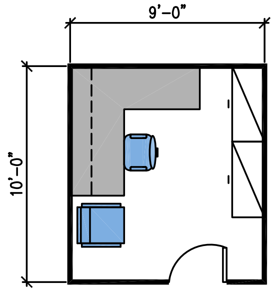
OPEN WORK STATION (60 SF)



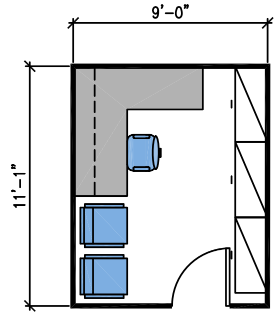
STAFF OFFICE (80 SF)

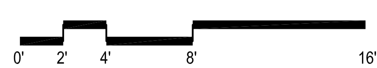


FULL-TIME FACULTY (90 SF)



COUNSELOR (100 SF)





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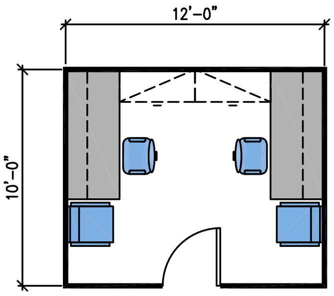

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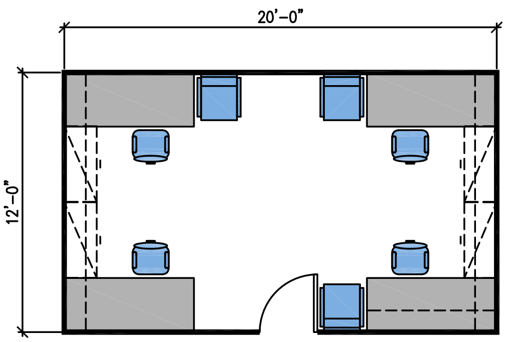

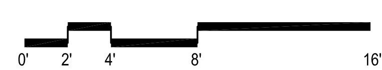

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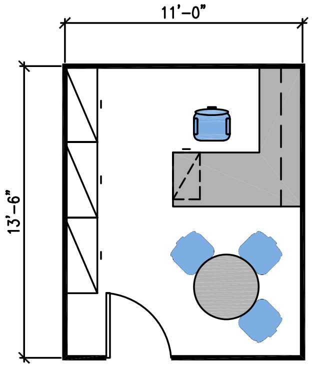

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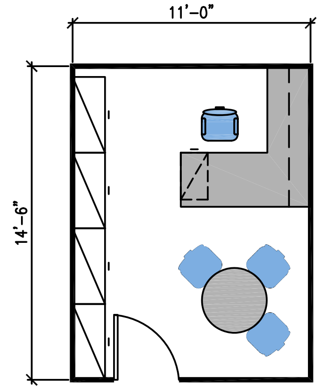

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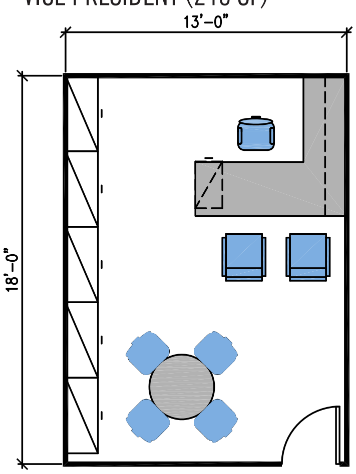

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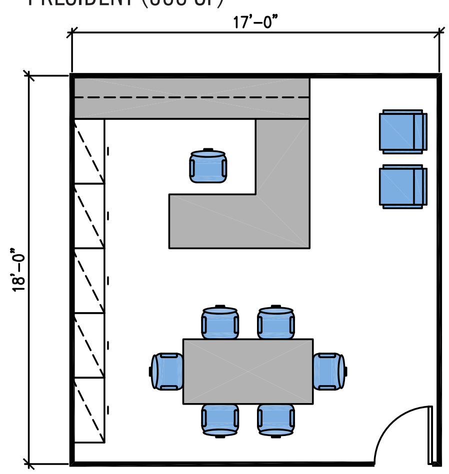

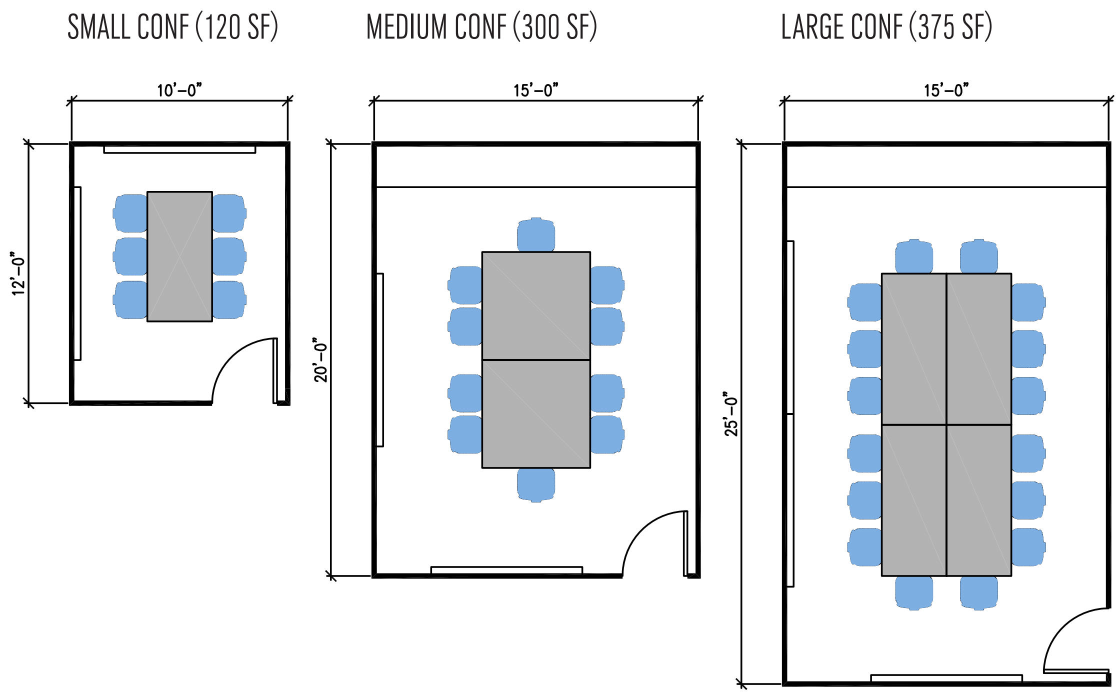
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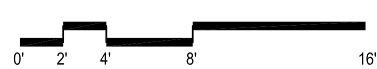
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6 | ACKNOWLEDGMENTS

TEAM

Master Plan Committee

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Virginia Moran, Director of Research and Planning
Daniel Bahner, Academic Senate President
Ted Philips, Coordinator of Technology Services
Carlos Maldonado, Student Success Technician
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IBE Consulting Engineers – Mechanical, Electrical, Plumbing

Snipes-Dye Associates – Civil Engineer

Ah'be Landscape Architects – Landscape

Davis Langdon – Cost

Shen, Milsom & Wilke / Paoletti – Security

Vantage Technology Consulting Group – Technology

Aquatic Design Group, Inc – Pool

Kaku Associates, Inc. – Traffic

Davis Associates – Signage

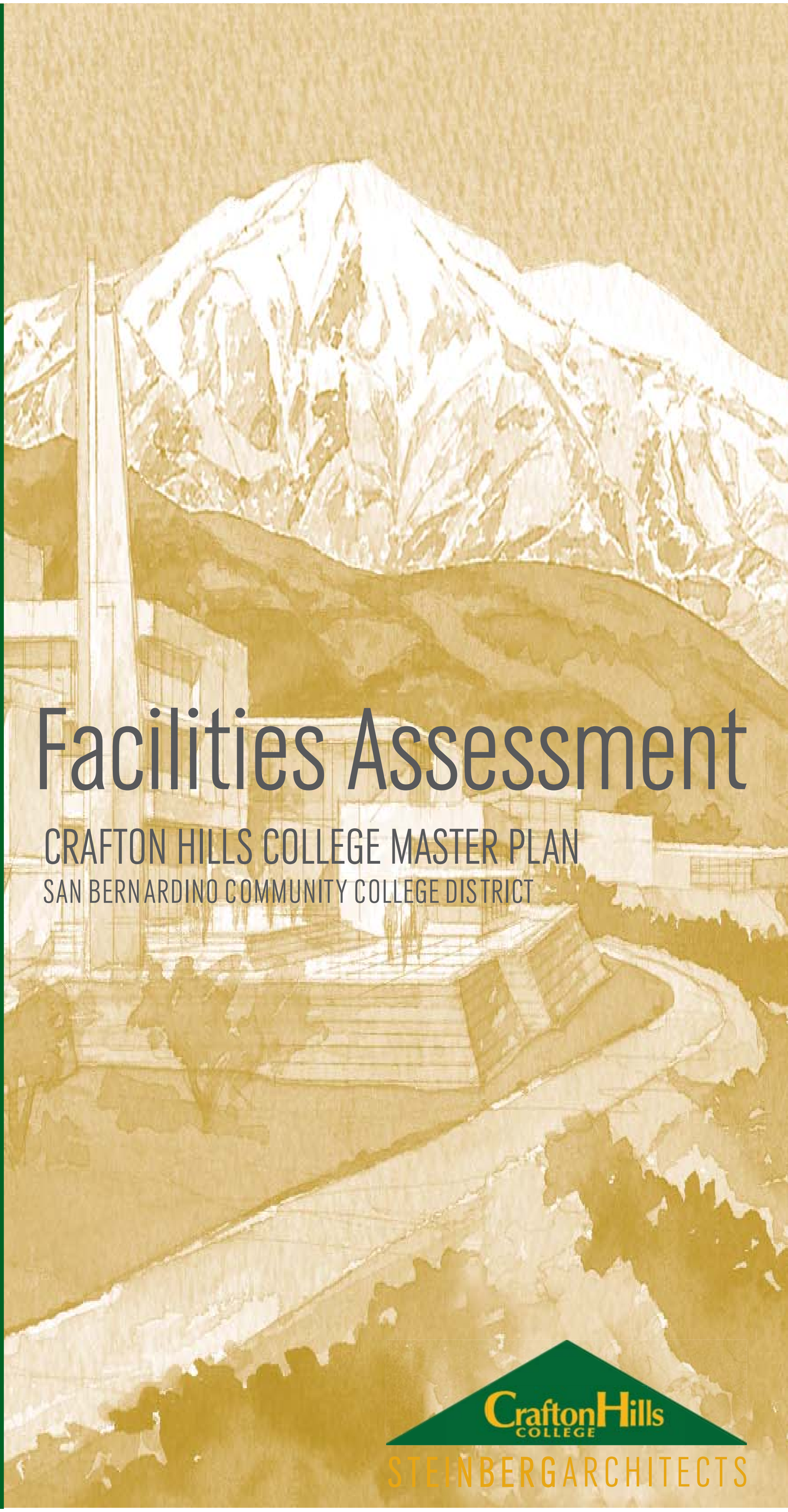
Appendix 7

7 | APPENDIX

Volume 3 | Facilities Assessment

CRAFTON HILLS COLLEGE MASTER PLAN

SAN BERNARDINO COMMUNITY COLLEGE DISTRICT



Crafton Hills COLLEGE

STEINBERG ARCHITECTS

Volume 1 Master Plan

Volume 2 Master Program

Volume 3 Existing Facilities Assessment

A | SUMMARY

OVERVIEW

An assessment of the existing facilities has been completed as part of the Crafton Hills College Master Plan. The findings identified in the assessment report help to ensure that various campus deficiencies are addressed in the 2025 master plan.

The assessment is divided into two basic components. The first component is site or campus wide systems. Included in this are civil, site utilities, landscape, technology infrastructure, site and building lighting, parking and vehicular circulation, security, and signage. The findings and recommendations that have been made regarding these elements are a critical part of the master plan, and the designs shown in volume four.

The second assessment component is building-specific assessments. The building assessments deal with general code issues as well as building systems. Exiting requirements, accessibility, and sprinklering have been addressed, along with those items pertaining to fire life safety, ADA (Accessibility) and maintenance. Structural, mechanical, plumbing, and electrical systems have all been examined, and recommendations have been made for the improvements of each of these systems. As with the campus wide systems, these findings and recommendations are an integral part of the master plan and volume four.

B | CIVIL

SITE DRAINAGE

Figure 1 - Typical site catch basin that collects surface drainage.

Figure 2 – Typical curb inlet located along Campus Drive.

Figure 3 – Concrete headwall discharging site storm drain to open channel located along the northerly side of Campus Drive.

System

- Site storm drainage consists of a system of surface flow to catch basins and inlets, conveyance through small diameter pipes, connecting to larger diameter storm drains and discharging to an open channel located along the northerly side of Campus Drive. The open channel discharges to a retention pond located in the vicinity of Campus Drive and Sand Canyon Road. Drainage flows from the pond, offsite in a natural swale running northwesterly along Sand Canyon Road.

Condition

- Isolated areas adjacent to buildings that lack sufficient gradients to allow surface drainage to area drains or catch basins.
- Areas on concrete flatwork that lack sufficient gradient to direct surface drainage to catch basins.
- Catch basins and inlets appear to be in good condition and function adequately.
- Small diameter drains appear to function adequately.
- Large diameter storm drains appear to be well maintained and function properly.
- Channel located along the northerly side of Campus Drive has developed into a natural creek. The channel appears to have adequate capacity to convey site drainage. The channel requires annual maintenance to restrict growth of vegetation.
- Retention basin located in the vicinity of Campus Drive and Sand Canyon has filled with silt and is overgrown with vegetation.

SITE DRAINAGE

Figure 4 – Retention basin spillway looking easterly into the basin.

Figure 5 – Retention basin spillway looking westerly downstream to Sand Canyon Road.

Figure 6 – Outlet structure within the retention basin.

Maintenance

- Continue maintenance of catch basins and inlets.
- Continue maintenance of both small and large diameter storm drains.
- Continue maintenance of open channel along the northerly side of Campus to limit the vegetation growth
- Remove vegetation and silt from retention basin to allow the basin to function correctly.

Repair

- Add area drains and catch basin in landscape areas where surface drainage is poor and ponding occurs.
- Replace hardscape areas where ponding occurs.
- Remove vegetation and silt from the retention basin to allow the basin to function properly.

SANITARY SEWER

Figure 7 – Typical sanitary sewer manhole located in pavement area.

Figure 8 – Typical sanitary sewer cleanout.

Figure 9 – Typical sanitary sewer manhole located in landscape area.

System

- The site sanitary sewer system consists of building waste lines connecting to site sewers at cleanouts located adjacent to the buildings. Site sewers consisting of gravity flow 6" and 8" pipes, cleanouts, and manholes convey the sewage to the campus trunk line located in Campus Drive. The trunk line flows westerly in Campus Drive, connecting to the City of Redlands sanitary sewer located in Sand Canyon Road.

Condition

- The sanitary sewer system appears to be well maintained and functions properly.

Maintenance

- Continue maintenance of cleanouts, manholes, and sanitary sewer lines.

Repair

- No repairs proposed.

WATER DISTRIBUTION

Figure 10 – Regulating reservoir located in the northeasterly portion of campus. Reservoir provides potable water to campus.

Figure 11 – Eight inch meter for campus water distribution system. Meter located at the northerly side of the tennis facility.

Figure 12 – Eight inch backflow device for the campus water service.

System

- The site water distribution system consists of potable water supplied by the City of Redlands Water Department. The City supplies water to the campus through a system of transmission mains, regulating reservoirs, and a pumping station. The City water main located in Sand Canyon Road extends onto campus easterly in Campus Drive and northerly to a regulating reservoir locate adjacent to the campus Maintenance and Receiving facility. Water from the reservoir is pumped through a transmission main located in Campus Drive, easterly and northerly to a second regulating reservoir located at a higher elevation in the northeasterly portion of campus. Water and fire protection water are provided to campus facilities from the transmission main. Fire hydrants located along Campus Drive and several hydrants located near the campus buildings are serviced from the transmission main.

- Potable water, irrigation water, and additional fire protection water are supplied to campus from an eight inch service and meter located at the north side of the tennis facility. From this service point, water is distributed to campus from a six inch main extending westerly in Campus Drive, looping southerly and easterly through the campus courtyard, and returning northerly to connect back in Campus Drive. Domestic service and fire protection for each building are provided from the six inch main. Several fire hydrants are also serviced from the main.

Fire Protection

- Fire protection for the Crafton Hills campus is provided by the City of Yucapia Fire Department.

WATER DISTRIBUTION

Figure 13 – Typical fire hydrant serviced from the City of Redlands transmission main located in Campus Drive.

Figure 14 – Fire department connection for the fire sprinkler system for the gymnasium.

Figure 15 – Site fire hydrant serviced from the metered site water main loop.

Fire Protection

- The current fire flow requirements of the Yucapia Fire Department are to provide 3000 gallons per minute at each fire hydrant.. A reduction of 25% of flow requirement is allowed for all buildings provided with fire sprinklers.
- The current water distribution system is incapable of providing flows sufficient to meet the current fire flow requirements.

Condition

- The water distribution system appears to be well maintained and functions properly.
- Preliminary calculations indicate that the current water distribution system is undersized and can not provide current required fire flow.

Repair

- The water distribution system must be upgraded to accommodate current requirements for fire flow.
-
- A detailed study of the current water distribution system will be prepared to determine the extent to which the system is deficient.
- Water main improvements will be required.

CIVIL 11x17 DIAGRAM - SITE DRAINAGE

CIVIL 11x17 DIAGRAM - SANITARY SEWER

CIVIL 11x17 DIAGRAM - WATER DISTRIBUTION

CIVIL 11x17 DIAGRAM - FIRE ACCESS

C | SITE UTILITIES

CAMPUS HIGH-VOLTAGE DISTRIBUTION SYSTEM

Figure 1 – Electrical manhole.

Figure 2 – Electrical cables.

Figure 3 – Available knock-outs. Manhole half-filled with water.

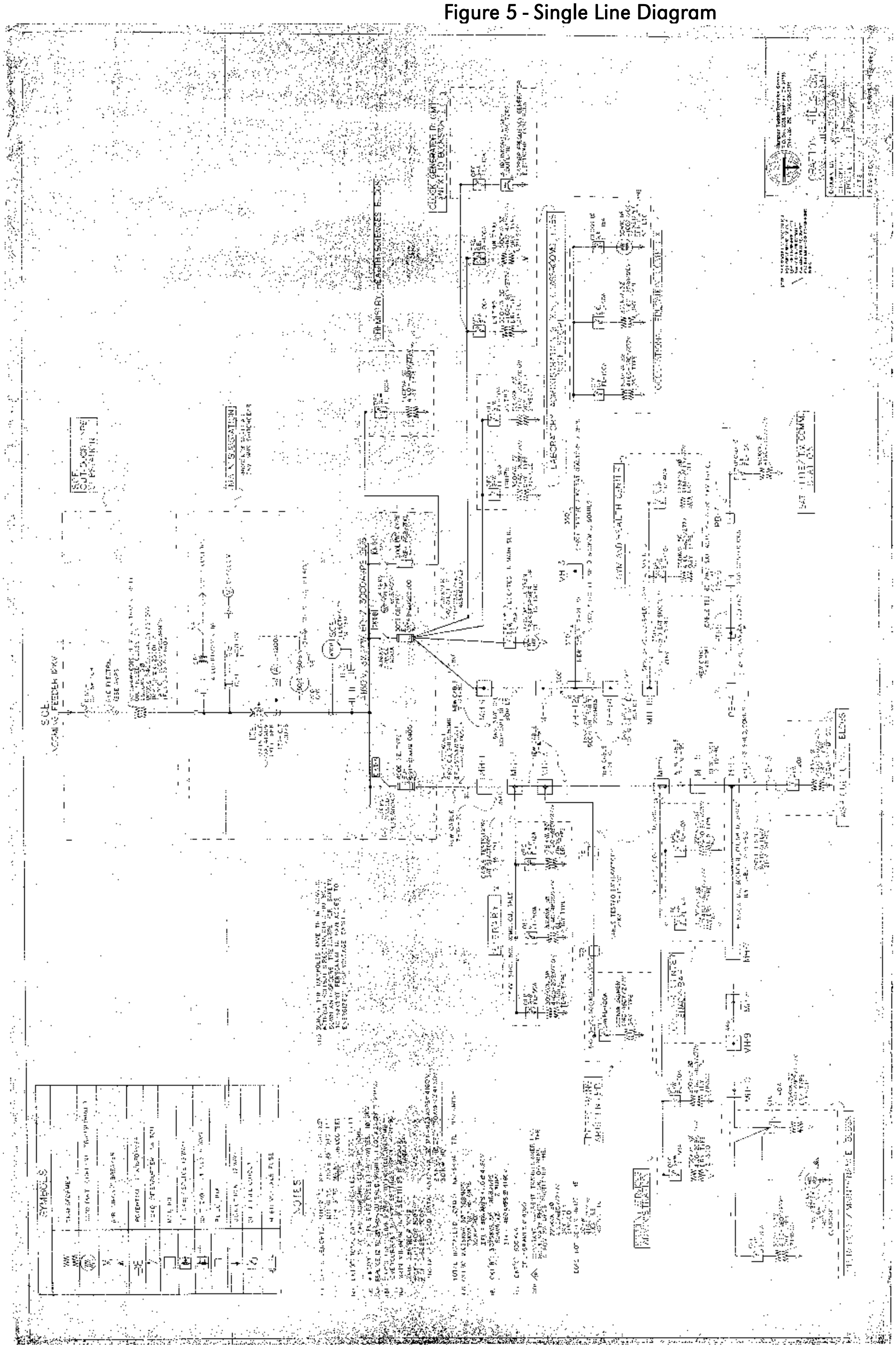
Figure 4 – Main service equipment.

Existing Site Power System Description

Southern California Edison (SCE) is the power utility provider. From the SCE supply point at Sand Canyon Road, west side of campus, the incoming SCE 12,000V service is ran underground and terminates in an outdoor 2500KVA substation at the Old Bookstore Building. It is then stepped down to 4,160V and metered at 5,000V main service metal-clad switchgear located inside an electrical room at the Old Bookstore Building.

From the main service switchgear, power is distributed radially at 4,160V throughout the campus via underground cables in underground ducts, pull boxes and manhole structures. At each of the power manholes, power is tapped from the 4,160V cables through 5,000V oil-filled fuse cut-outs and stepped-down to 480/277V and/or 208/120V by step-down transformers at or in the individual buildings. The main service switchgear consists of three (3) circuits, "A", "B" and "C". Circuit "A" serves the Library, Performing Arts Center, Student Services A & B, Student Center/Cafeteria, Maintenance and the Agricultural building including (1) street lighting circuit. Circuit "B" serves the Laboratory/Administration, Classroom, Bookstore, Occupational Education 1 & 2, Gymnasium, Satellite/T.V. Communication station, Clock Generator Station and two (2) street lighting circuits. Circuit "C" serves the Chemistry & Health Science building. The load status of each circuit is yet to be evaluated.

Figure 5 - Single Line Diagram



CAMPUS HIGH-VOLTAGE DISTRIBUTION SYSTEM

Figure 6 – Typical oil-filled fuse cut-outs.

Figure 7 – Main service metal-clad switchgear.

Figure 8 – Constant current transformer with oil-filled fuse cut-outs for street lighting power.

Figure 9 – Outdoor sub-station.

Recommendations

- Campus High-Voltage Distribution System
  - Main issue with the majority of the manhole is the water running into it. Almost every manhole is half-filled with water. It is recommended that all manholes be looked at to determine how water accumulation can be prevented.
  - The existing high-voltage distribution equipment are discontinued models from Zinsco and G&W with no replacement parts available. However, these existing equipment are still in good working condition and require regular inspection and maintenance.
  - The existing 5KV oil-filled fuse cut-outs are discontinued models from G&W and no replacement parts are available. These equipment are in excess of their life expectancy. At this time, these equipment are still in good working condition and there is no immediate need of replacement. However, if any of the building will require renovations, replacement of all existing electrical equipment is strongly recommended.
  - The majority of the existing high-voltage distribution transformers are in excess of their life expectancy and it is recommended that whenever an opportunity comes that they be replaced.
  - Prior to any future expansion, visual inspection and integrity testing of the underground high-voltage cables are recommended.
  - Periodic inspection of and, if necessary, torque adjustments of wire terminations at switchboards and distribution boards are recommended.
  - For purposes of adequacy, a campus-wide power system study is recommended prior to implementing any future major expansion of the existing facilities. The study will include the maximum demand of the campus as a whole and the maximum demand of each building to verify adequacy of the existing power service and infrastructure. The study will also include the calculation of the available short-circuit current and voltage profile at the main service of each building.

CAMPUS HIGH-VOLTAGE DISTRIBUTION SYSTEM

Figure 10 – Oil-filled fuse cut-outs.

Figure 11 – Indoor service equipment.

Figure 12 – HVAC pipes above electrical panel.

- Building Electrical Facilities
    - With the exception of the relatively new electrical equipment in the Child Development Complex and the Bookstore Complex, electrical equipment such as panelboards and switchboards, in the older buildings are discontinued models from Zinsco with no replacement parts available. These existing equipment are in excess of their life expectancy but are still in good working condition. It is strongly recommended that should opportunity arise, such as a major building renovation, that these existing equipment be replaced. At this time, periodic inspection, and if necessary, torque adjustment of wire connections in distribution boards and switchboards are recommended.
- Fire Alarm System
    - All the older buildings in the campus will require an upgrade or complete replacement of non-ADA compliant fire alarm system except in the newer buildings that are equipped with equipment and devices compliant with ADA requirements.

Campus Master Gas Meter

General Description

- The master gas meter is located on west of the campus.
- High pressure gas is supplied to the meter by Gas Company. Gas Company's gas pressure regulators reducing the pressure to 3 to 5 PSI (to be verified).

Piping

- A 6" painted gas line appears to be black steel enters underground and delivers gas to the campus.
- Above ground piping appears to be in fair condition.

Campus Natural Gas Demand

Building	Cubic feet per hour
• 01 Laboratory/Administration	9,990
• 03, 04 & 05 Student Center	5,855
• 06 Occupational Edu. I	700
• 07 Occupational Edu. II	900
• 09 Maintenance	1,159
• 10 Gymnasium	1,980
• 12 Chemistry & Hlt. Science	250
• 13 Child Development I	409
• 14 Child Development II	274
• 17 Bookstore	600
• Bookstore Complex	600
Total	22,717 CFH at 850 feet developed length to building EO-2

Campus Master Gas Meter

Future Development and gas Load discussion

- Assuming future gas load increases through next 15 years by 7,000 CFH, then the total gas consumption will be approximately 30,000 cubic feet per hour.
- Assuming the future furthest building from the gas meter to be 150 feet east of building OE-2, then the total developed length from gas meter to furthest building gas pressure regulator will be 1,000 feet.
- For the above ultimate gas load the existing gas meter 6" discharge at 3 PSI is adequate.
- Underground pipe sizes can not be determined to evaluate the existing branches capacity vs. pipe size.
- In according to the maintenance personnel, the newly installed boiler in central plant building #1 are starving for gas. It seems that ample gas capacity can not be delivered in the existing underground piping to building #1.

Recommendations

- Inform gas company to up date the existing meter to have the ability to deliver 30,000 CFH gas, 3 PSI at 1500 developed length.
- Investigate underground piping for proper sized to deliver gas to all gas pressure regulators.
- Provide a gas loop to overcome the friction in the underground gas piping.

D | LANDSCAPE

Existing Campus Landscape Assessment


Figure 1.1 - Campus's connection to the surrounding landscape.


Figure 1.2: The campus architecture is designed to extend views outwardly.


Figure 1.3: Inside-outside nature of the campus' built spaces

An assessment of the Crafton Hills College landscape is presented in the following pages. Discussions of the various campus outdoor spaces and materials are organized into the following sections:

1. General Landscape Character
2. Vehicular Circulation
3. Pedestrian Circulation
4. Green Outdoor Spaces
5. Paved Outdoor Rooms
6. Site Furnishings
7. Irrigation Assessment

The Diagrams, referred to in several sections, are located at the end of this assessment report.

1. GENERAL LANDSCAPE CHARACTER

- The original design layout and architecture of the campus creates a symbiotic relationship between the built environment and the Crafton Hills College landscape.
- The built environment is integrated well with the surrounding landscape, creating a non-invasive built community.
- The inside-outside nature of the campus should be highly valued as a unique asset and reinforced wherever possible.
- The landscape of the campus should correspond to, support and extend into the naturalized areas adjacent to the campus.

2. VEHICULAR CIRCULATION

Figure 2.1: College Marquee at Southern Entrance along Sand Canyon Road

Figure 2.2: Campus Drive

Figure 2.3: Central Entry at Parking Lot D

Character and Function

Diagram 1 provides Vehicular Circulation Zones, as discussed below.

- Campus Drive is the main vehicular spine running through campus (Diagram 1). This two-lane connector forms a loop through campus, links the College's southern and western entrances along Sand Canyon Road, and provides the only access into the campus parking lots.
- Mass plantings of native and non-native trees and shrubs border either side of Campus Drive at the College entries (Figure 2.2). As an entry drive, the landscape lacks definition or visual cues.
- A secondary system of roads provides service access to the existing buildings (Diagram 1).
- College marquees identify the Sand Canyon Road entries and the College's central entry at parking lot D (Figure 2.1 and Diagram 1). The marquees are clearly visible from the road and serve well as campus identification signs. However, the plantings surrounding the signs do not reinforce a strong gateway concept.
- The Central Entry at parking lot D includes limited parking, a bus stop and visitor drop-off area (Figure 2.3). The marquee sign identifies this arrival point, but the space lacks visual impact. Although visitors enter the heart of the campus, (i.e., the Central Quad) from this point, they will not be aware of this until they stand in the middle of the Central Quad.

Figure 2.4: The landscape edge at parking lots E through I is visually open into the campus.

- The group of parking lots serves as the front door to the main campus and, as such, creates visitors' first impression of the College. Along the roadside edge, the landscape provides a wide, green buffer between Campus Drive and the parking lot. The use of lawn and trees, instead of large shrubs, also provides visual access into the lots.
- Mixed plantings of primarily Sycamore trees (Platanus racemosa) and evergreen shrubs effectively buffer and separate each lot. Although the landscape buffers take up potential parking spaces, the additional green edge breaks up the expanse of asphalt visitors see when they first arrive.
- At the southern perimeter of parking lots A, B and C, a landscaped slope separates the lots from the campus. People who park in these lots must climb stairs to get to their destinations. Thickly planted with mature Eucalyptus trees, this landscape edge provides an evergreen screen between the western campus and the parking lots.
- The southern perimeters of parking lots E, F, G, H, and I are less steep than lots A through C. The edge planting in these lots is primarily lawn, tall fescue grass, Sycamore trees and pine trees. The perimeter is visually open to the campus and the pedestrian paths leading to buildings (Figure 2.4).
- In contrast to its perimeter landscape, the parking lots' interior landscapes can be described as "Planted" and "Exposed," as described below:

Figure 2.5 – "Planted Parking Lot"

Figure 2.6: "Exposed Parking Lot"

Figure 2.7: Gravel lot as extreme example of "Exposed Parking Lot"

- The interior islands of the "Planted Lots" are planted primarily with Evergreen Pear trees (Pyrus kawakamii), groundcover and lawn. The trees provide much needed shade and the planters reduce the visual and heat effect of asphalt (Figure 2.5).
- "Exposed lots" have little to no planting and accommodate a greater volume of cars (Figure 2.6). In some Exposed Lots, plant material is absent in a few, but not all, planters, suggesting the plants were removed and not replaced. The tree species in these lots tend to vary. A gravel lot located at the western end of Campus Drive is an extreme example of the Exposed Lot (Figure 2.7).

Issues and Opportunities

- Enhancement of the landscape along Campus Drive and at the marquee gateways can make the campus entry more welcoming and memorable for visitors. The three marquee gateways can share a more distinct and related design that visually connects them to each other and better defines each one as a destination marker.
- Secondary/service roads do not extend to all buildings. Even if the road connects to a building, it is not always the most direct route, as seen with the Performing Arts Center loading dock. College personnel and delivery drivers will use pedestrian walkways as alternative routes to gain closer access to buildings, resulting in damage to paving, plants and equipment (see Figure 2.8).
- Parking lot entrances/exits get congested when traffic volume is high.

Figure 2.8: View of damage to paving, planting and irrigation.

Figure 2.9: Lack of visual cues or focal points at Central Entry into the Quad"

- During peak times, overflow parking occurs along the street on Campus Drive. The overflow worsens during class registration when student parking continues down to Sand Canyon Road, forcing students to walk a great distance uphill.
- The Central Entry at Lot D lacks visual cues and a focal point. Upon entering this area, the initial view of the Central Quad is a rectangular area of lawn, leading the eye to the sky instead of a terminus or focal point (Figure 2.9). This arrival area can be greatly enhanced by the creation of a transitional area from the drop-off into the Central Quad, or a north-south axis leading to the PAC building.
- Although not observed during our site visits, the grounds staff indicated that some of the Evergreen Pear trees (Pyrus kawakamii) in the Planted Lots and elsewhere on campus are suffering from a bacterial disease known as "fire blight". Unless proper horticultural management practices are implemented, fire blight will eventually cause the infected trees to die.
- The addition of plants within the Exposed Lots can reduce the "sea of parking" effect, provide shade and further enhance the campus frontage. Selection of trees and other plant material should accommodate the grounds staff's desire for low maintenance planting.
- Litter is a problem in most of the parking lots. Trash receptacles within the parking lots can alleviate some of this problem.

3. PEDESTRIAN CIRCULATION

Figure 3.1: A pedestrian spine serves as a campus outdoor hallway.

Figure 3.2: Secondary path near Student Service B.

Figure 3.3: Students cut across lawn near Library to avoid less direct routes.

Character and Function

Diagram 2 provides Pedestrian Circulation Zones, as discussed below.

- Pedestrian routes into the campus core begin at the parking lots.

- Pedestrian walkways are viewed as extensions of nearby buildings and act as outdoor hallways, connecting both interior and exterior places.

- A primary pedestrian spine connects the major campus buildings (Figure 3.1). Concrete pergolas, located at opposite ends of the campus, architecturally reinforce the idea of the outdoor hallway along this spine.

- An indoor-outdoor connection is expressed whenever walkway and building joints align and their color/finish match.

- Pedestrian walkways provide multiple accesses to buildings without creating paths that feel like alleys or backs of buildings. Their design provides directional clarity and a sense of safety, while offering outward views of the surrounding landscape or internal views of the campus.

- A secondary pedestrian circulation system wraps around the buildings and provides access into classrooms and facilities, as well as views of the surrounding hillsides (Figure 3.2).

- Informal walking paths exist within the outer naturalized areas of the campus, golf course and campus recreational zones.

Figure 3.4: "Cow path" between Parking Lot G and the Bookstore.

Figure 3.5: Ramp near LADM is not compliant with ADA standards.

Figure 3.6: Inconsistent hardscape treatments between newer and older paving.

Issues and Opportunities

- A hierarchy between primary and secondary walkways is unclear. Paths can be better delineated in a variety of ways, including the repetitive use of specific landscape and paving material, varying walkway widths, placement of site furnishings, and/or wayfinding methods that provide visual cues and references.

- Pedestrian walkways do not always transcend the most direct routes, encouraging students to create "cow paths" through the landscape (Figure 3.3). The cow paths are most obvious near the parking lot areas (Figure 3.4). New walkways can be installed where landscape areas are most damaged.

- Pedestrian routes to parking lots and buildings are not always compliant with A.D.A. standards (Figure 3.5) and should be corrected in future work.

- Paving damage is evident where pedestrian walkways are used as alternative vehicular routes to buildings (Figure 2.8). Vehicular access to existing walkways can be blocked or restricted with the addition of bollards. Alternative routes for service and delivery should be identified in future work.

- The finish and color of new paving is not consistent with older paving. In areas, such as the Library, the paving stain is faded and attempts to match the stain are unsuccessful. (Figures 3.6)

4. GREEN OUTDOOR SPACES


Figure 4.1: The Upper Green near the LADM Building


Figure 4.2: "Informal Green Room" located outside of the Laboratory Administration Building.


Figure 4.3: Mature Sycamore trees shade the lawn area near the Student Center loading area.

Character and Function

Diagram 3 presents the Green Outdoor Rooms discussed below. These outdoor spaces are described as "Green Rooms", "Green Walls", and "Green Zones".

- Crafton Hills College enjoys a series of Green Rooms that can be characterized as formal and informal spaces.
  - The Formal Green Rooms are large open lawn areas enclosed by buildings, walls and walkways (Figure 4.1). They have simple landscapes of trees and turf. Formal Green Rooms include the "Upper Green" between the LADM and Chemistry & Health Science buildings, the "Library Green" between the Library and the Student Services A (SSA) building, and the "SSA Green" below the Clock Tower (Diagram 3). Sycamore trees (Platanus racemosa) create the canopies for the Library Green and the Upper Green. Gingko biloba trees are used in the SSA Green.
  - "Informal Green Rooms" are located along the outer edge of campus. Like the Formal Green Rooms, they are landscapes of open lawn with trees. However, they provide outwardly views of the surrounding hillside because they are adjacent to the Naturalized Zones (Diagram 3) and are not surrounded by buildings and walls. These spaces are intended for activities such as students sitting on the lawn or throwing frisbees (see Figures 4.2 and 4.3).

Figure 4.4: "Green Walls" define edges.

Figure 4.5: Ornamental grass and low shrubs near Library provide transition edge between campus and surrounding hills.

Figure 4.6: Slope planting creates a Green Wall between the Performing Arts Center Plaza and the Central Quad.

- "Green Walls" are the landscaped spaces that are not intended to be occupied by people. They act as edges to the spaces they surround and as transition areas between the campus and the Naturalized Zone. They also screen and separate areas, such as the parking lot perimeters (Figure 4.4). In some cases, they are low shrub areas (Figure 4.5) and in others they are more like perimeter walls (Figure 4.6).

- Two large Green Zones surround the College:

    - The "Naturalized Green Zone" is located on the College's southern perimeter (Diagram 3 and Figure 4.7). The Naturalized Zone is primarily grassland (consisting of a coastal sage scrub plant community) with some non-native and ornamental plants. For more information on the plant communities in this area, refer to the Biological Constraints Analysis Report, prepared by Ecorp Consulting, dated March 3, 2,005.

    - On the College's northern perimeter, the golf courses and soccer/recreational fields provide a large greenbelt, consisting mostly of turf lawn areas (Diagram 3). This zone extends the College's verdant landscape into the surrounding hills (Figures 4.8).

Issues and Opportunities

- Formal Green Rooms are not distinct from each other. The spaces can be better defined by careful selection of plant material and placement of site furnishings. For example, each space could have a specific accent tree or accent planting to help define an edge or locate building entries.

Figure 4.7: View of "Naturalized Green Zone"

Figure 4.8: The SSA Green with its lawn area and Gingko trees

- Green Rooms generally lack vibrancy. Students and others seem to pass through the spaces without lingering. The insufficient quantity of seating, particularly within the Formal Green areas, provides a partial explanation. The addition of benches would encourage students to stop, enjoy the landscape views and shade, and possibly turn the areas into more active social spaces. The overall program for these spaces should be revisited as the campus is developed.

- The existing campus plant palette provides a verdant landscape, but plant diversity is limited. Sycamore, Evergreen Pear, Eucalyptus and Pine trees are used repeatedly and turf grass is found extensively as groundcover on campus. Flowering or accent planting could supplement existing plant selections and provide more distinction between spaces, particularly those places that are considered campus icons. Turf can be replaced with drought-tolerant or low maintenance groundcover in selected areas, providing diversity while reducing maintenance and water resources.

- The lawn in the SSA Green is a maintenance issue since mowers must be carried up and down the steps (Figure 4.8). Replacing the lawn with groundcover or hardscape material can alleviate this problem.

- Wildlife (e.g., snakes, bobcats) are occasionally sighted on campus and require additional maintenance attention. For example, the grounds staff cuts "no-mow" ornamental grasses near walkways because snakes hide in them. As the campus landscape is developed, such issues need to be considered.

Figure 4.9: Mistletoe growing on Sycamore tree

Figure 4.10: View of soccer field within the "Recreational Green Zone"

- Green walls predominantly consist of non-native plant communities, diminishing native habitat potential and requiring significant maintenance and irrigation.

- Naturalized zones consist of conflicting native and non-native species, lowering their ecological integrity.

- Non-native species are not providing adequate habitat, and risk jeopardizing the existing surrounding native plant communities.

- Campus trees suffer from horticultural pests and diseases. Mistletoe (a parasitic plant observed on Sycamore trees), psyllid (a pest attacking Eucalyptus trees) and fire blight (a bacterial disease affecting the Evergreen Pear trees) are current problems (Figure 4.9). If the diseases/pests are not horticulturally managed, trees can be weakened and sometimes killed, especially if they are stressed by other problems such as drought. We recommend the College hire a certified arborist to assess tree conditions. An arborist can determine the extent of damage to infected trees and make recommendations regarding their disposition.

- The Recreational Green Zone requires significant maintenance and irrigation which is disproportional to the volume of use it incurs. The golf courses and soccer field are minimally maintained. A jogging/track path exists around the soccer field, but it appears to be makeshift and in need of improvements. Tennis courts require updating and the outdoor basketball courts are used for fire rescue exercises instead of basketball. Pathway access to the soccer field and courts require improvements.

5. PAVED OUTDOOR ROOMS

Figure 5.1: View of Plaza at Cafeteria/College Center Building

Figure 5.2: Performing Arts Center Plaza

Character and Function

Diagram 4 presents the paved outdoor rooms discussed below. Paved outdoor rooms can be categorized as the Plaza, the Court and the Foyer.

A. Plazas

Plazas are large outdoor paved areas with planting at their perimeters or in contained areas. Plazas are intended to facilitate outdoor events (Diagram 4). Three significant Plazas exist on campus.

- The Cafeteria Plaza is adjacent to the Student Center Building (Figure 5.1). The concrete paving has a repeated hexagonal pattern in colors of terracotta red and natural concrete. These same concrete paving colors are used throughout the campus and unify the campus spaces. The canopies of mature Sycamore trees located in raised planters provide shade and act as overhead planes in the space, containing it and giving it a pedestrian scale against the surrounding buildings' mass. The planters are placed in an informal arrangement, with their shape matching the paving pattern and adding design definition. A dense planting of shrubs separates the plaza from an adjacent walkway/service road and completes its enclosure. Additional planters throughout the space help to soften this primarily paved space. Students have an adequate amount of outdoor furniture for eating, sitting and socialization.

Figure 5.3: Close-up view of Plaza at Performing Arts Center

Figure 5.4: View of Central Quad

- The Performing Arts Center (PAC) Plaza is the roof for a portion of the PAC building (Figures 5.2 and 5.3). Its perimeter is defined by a sloping landscape of evergreen and flowering plants (e.g., Olive Tree, Crepe Myrtle), a wide staircase, and a line of benches. Because visitors step down into the PAC Plaza, it is characteristic of an amphitheatre, but it is not used as such. The plaza is used primarily for outdoor events associated with the Performing Arts Center, e.g., pre-performance gathering, an outdoor art gallery. The space has the feel of an urban entry plaza—i.e., a wide expanse of patterned, colored concrete paving (in red and natural) that is open to the elements.

- The primary plaza space is called “Central Quad” and is a major campus nexus (Figure 5.4). This space is used for large campus events, such as graduation, and student organization/club activities. Its edges are defined by the Laboratory Administration Building’s main staircase to its east, the central entrance (at parking lot D) to its north, the Library on the west and the Performing Arts Center stairs to the south.

  Four large planters arranged in rows and the plaza’s enhanced concrete paving (a red grid pattern with bands of natural colored concrete) reinforce the formality of the space. People make use of the planters’ high edges for sitting and resting away from the sun. Evergreen pear trees and juniper shrubs fill the planters.

Figure 5.5: View of Library Court.

Figure 5.6 View of Foyer space at a SSA classroom entry.

A significant staircase gives this plaza a grand scale and lead visitors down from the LADM building into the Central Quad. Anyone standing at the stairs will enjoy great views of the internal and external landscapes.

B. Courts

Courts are primarily hardscape spaces associated with a specific campus building (Diagram 4). Some courts are accessible from the building, while others are only accessible from within the building. The Library Court (Figure 5.5), the Upper Court of the LADM building, and the Bookstore Court are the primary courts on campus.

The Library Court is located along the primary campus pedestrian spine and has views of the internal campus landscape and outward views to the hills. The LADM Upper Court sits at the top of the Central Quad stairs and serves as a building forecourt, with views over the Central Quad and the Upper Green. In comparison, the Bookstore Court is smaller, more internally focused and enclosed. Planters and seating are placed against its perimeter, putting the visual focus on its plain concrete paving. An alcove area within the OE1 building is nothing more than a vending machine area, but it is a space with a great view of the adjacent hills.

C. Foyers

Foyers are small spaces adjacent to classroom entrances (Figure 5.6 and Diagram 4). Although they are smaller in scale to plazas and courts, the existing foyers are not intimate spaces. For the most part, they are open and very public spaces, with few amenities and little to no landscape character.

Figure 5.7: Bookstore Court feels void of people, seating and shade.

Issues/Opportunities

- The College has a variety of outdoor spaces, but most seem underutilized. Activating these spaces will require the development of more scheduled events for the spaces and the addition of amenities that maximize user comfort (shade trees, seating, shade structures). The Bookstore Court, for example, is so void of amenities that it feels empty and overly exposed to the elements (Figure 5.7).

- The planting within the Central Quad does not reinforce it as the heart of the campus. Specimen trees, accent or flowering planting, and accent features could give the space the visual impact appropriate for a campus icon.

- The Cafeteria Plaza is purposefully designed to maximize user comfort and provides a social gathering space. Its design elements should be considered when creating other social spaces on campus.

- Although the Library Court is located in the middle of the primary pedestrian spine—a high traffic area—the shade trees, tables and benches are amenities that draw students to it. It is a very public space, a place to be seen and for chance meetings.

Figure 5.8: Stairs and landings become “Found Spaces”.

Figure 5.9: Students use guard walls for seating between classes.

Figure 5.10: Low fencing surrounding the Child Development playground.

- Due to the lack of site furnishings in many of the outdoor spaces, students take advantage of “found spaces,” such as stairs and landings, for informal gatherings (Figure 5.8). They also sit on the guard walls located outside of their classrooms (Figure 5.9). Since these guard walls protect people from the sometimes steep adjacent slope, its use as seating should be a safety concern.

- The campus does not have sufficient “private spaces.” Private spaces are informal and small in scale. They are designed for personal study space or small group interactions. The Foyers come closest to the idea of private spaces, but they lack the amenities and landscape buffers that make them feel intimate.

- Students congregating in foyer spaces can be disruptive to nearby classes in session, and some teachers don’t want to encourage their use as social spaces.

- The Child Development buildings include a large children’s playground area. This playground is a unique space within the campus. The playground is partially bordered by a fence that seems too low for security purposes (Figure 5.10). A landscape hedge would enclose and provide a green buffer.

- There are drainage problems in some plaza areas. For example, the Performing Arts Center Plaza has general drainage problems, including some caused by the existing irrigation system.

6. SITE FURNISHINGS

Figure 6.1: Backless concrete benches line the perimeter of the Performing Arts Center Plaza.

Figure 6.2: Backless concrete bench with painted wood seat located at stair landing. Bench is similar to PAC Plaza benches.

Figure 6.3: Metal and wood benches with backs located outside the LADM Building.

Crafton Hills College's existing site furniture is a mixture of styles that don't always relate to each other or the surrounding elements. The most prevalent furnishings are cast concrete products and they correspond well with the campus architecture. But the furnishings are not consistent throughout the campus. The collection should be reduced to one coordinated set that is in keeping with the architecture and the indoor-outdoor relationship prevalent to the campus design. Overall, the campus has an insufficient quantity of site furniture, given its size, its number of outdoor spaces, and its views.

Benches/Seating

- The most commonly found benches on campus are two backless, concrete bench styles that share similar profiles. Although their concrete frames and legs match, the seat material is either concrete (Figure 6.1) or wood (Figure 6.2).
- The turquoise colored wood seat on the concrete-and-wood bench is repeated in a metal-and-wood bench style found near the LADM building (Figure 6.3). The repeated use of color is an effective way of combining different styles.
- The paint and finish for most of the wood-seated benches show signs of weathering (Figure 6.4).

Figure 6.4: Paint and wood wear on many of the existing benches.

Figure 6.5: Raised planters serve double-duty as seating in the Cafeteria Plaza.

Figure 6.6: Concrete tables are donated by College Alumni.

- Concrete handrails, once part of the original campus architecture, were removed and recycled as benches. These "benches" were observed in the Upper Green area between the LADM and CHS buildings and in a snack alcove in the OE1 building. Although they look similar to the other concrete campus benches, they are massive pieces and rather high-seated. Students, however, use them, reinforcing the need for more campus seating.

- Raised planters, such as the ones located in the Central Quad and the Cafeteria Plaza, provide seating for passersby (Figures 6.5).

- Students take advantage of the many campus stairs for seating and socializing, particularly when they are located just outside of classrooms.

Tables

- One concrete table style is found throughout campus (Figure 6.6).

- Plaques placed on the table tops indicate that the tables were donated to the College by alumni and other individuals.

- Although the table is probably available with an umbrella option, no umbrellas were observed on campus. In areas with lots of sun exposure, tables were placed in the shade of buildings. Such placement sometimes pushes the furniture to the perimeter of an outdoor room and leaves the space looking and feeling vacant (e.g., at the Bookstore Court). The possibility for social activity within those spaces is then not realized.


Figure 6.7: Primary concrete trash receptacle.


Figure 6.8: Trash receptacle at CDC building.


Figure 6.9: Metal trash receptacle.

Trash Receptacles

- The College uses one particular concrete receptacle for most of the campus (Figure 6.7). This receptacle is consistent in style with the concrete tables.

- However, several other trash receptacles were observed throughout the site (Figures 6.8 nd 6.9) The styles are not consistent with each other or with the primary concrete trash receptacle.

- Trash receptacles within the parking lots are recommended since litter is a problem in these areas.

Other Site Furniture

- Drinking fountains are generally wall-mounted styles that are part of the campus buildings. Except for an unusual fountain-trash receptacle combination located on the golf course, no standalone drinking fountains (e.g., pedestal styles) were observed.

- No bollards were observed on campus. Bollards could be helpful in controlling the number of people who drive their vehicles onto pedestrian paths and plazas/courts. For example, faculty, staff and delivery vehicles are driven from Parking Lot E to the LADM and CHS buildings. This practice causes damage to the paths, the landscape and irrigation, and results in additional maintenance issues.

LANDSCAPE

LANDSCAPE

LANDSCAPE

LANDSCAPE

7. IRRIGATION ASSESSMENT

An irrigation system walkthrough was conducted at the Crafton Hills College site on March 10, 2005 with the intent of determining current system deficiencies and possible remedies. Daryl Covino, the College's Grounds Supervisor, led this walkthrough. This section provides a recap of the site visit observations, and the issues and remedies for irrigation.

Observations

A. Campus Grounds Department requires a 10 p.m. to 6 a.m., 6 day-a-week water window.

- Problem: The water flow requirement, in gallons-per-minute, may be a limiting factor. This watering window has been determined by the Grounds Department to cause the least amount of impact to students—i.e., very few students are on campus during these hours. The golf course, however, may make use of an extended 12 hour operating watering window.
- Remedy: Determine water flow availability from the water purveyor and design main lines and pumping station to accommodate all irrigation within the watering window. The figures below indicate the water demand requirement for the month of July. The month of July is considered the "worst case scenario" for irrigation water demands. All other months would require less demand.

  By means of an 8-hour watering window, the estimated water flow requirement for the campus is 1,275 GPM.
  By means of a 12-hour watering window, the estimated water flow requirement for the golf course/soccer fields is 480 GPM.

B. Irrigation is currently on domestic water supplied by the City of Redlands (City Contact: Mike Taylor, telephone: 909.557.6447).

- Problem: Staying with domestic (potable) water will incur increasingly higher costs. Domestic (potable) water supply is a non-renewable resource. Available resources are dependent on demand and yearly weather patterns. Domestic water use has seen a steady increase in demand and tremendous variations in availability occur from one year to the next. These factors have led to increasingly higher delivery fees. The industry does not see a reversal of this trend. From an environmental perspective, if alternate water sources are available, the use of domestic water for landscape can be seen as "wasting precious water".

- Remedy: Review the possibility of other water resources such as reclaimed water or non-potable water delivered to the campus.

C. Campus Grounds Dept. (telephone: 909.389.3381) is very interested in tying into the new 16" non-potable water main on Sand Canyon.

   - Problem: Infrastructure costs. The tie-in may alleviate the issue of the availability of an alternate water source. It has not been determined whether the water purveyor can supply the amount of water required by the campus. Tying into the non-potable line will require a tap and water meter installed by the water purveyor.
   - Remedy: Determine the quantity of water and the gallons-per-minute flow rates the water purveyor can supply for the campus.

D. Non-potable water (raw lake water) is supplied by Yucaipa Valley Water District (City Contact: Brett Anton, telephone: 909.797.5118, extension 5).

   - Problem: None. Non-potable water delivered by the YVWA is actually slightly filtered lake water from Silverwood Lake. The filtration for non-potable water is not quite as stringent as it would be if it were labeled "drinking water". This non-potable water is not considered "reclaimed water" because RW is water that would typically be directed to the sewer system but instead is "reclaimed' through processing at a reclaimed water facility.
   - Remedy: None

E. Yucaipa Valley Water District (YVWD) will work with the College (flow/pressure) due to the large volume of water required to irrigate the campus.

   - Problem: None. Brent Anton with the YVWD has put a positive step forward in his willingness to work with the College. Due to the fact that the college will be a major non-potable user, he indicated he might be able to manipulate the system to be more in line with the campus' actual needs.
   - Remedy: None

F. Current irrigation configuration cannot complete all required irrigation within the water window.

   - Problem: With the existing irrigation mainline sizes, it is not possible to run the amount of water through them in order to irrigate the campus within the prescribed 8-hour water window.
   - Remedy: Increase the size of the irrigation main lines to accommodate the necessary water flow to irrigate the campus within the prescribed water window.

G. The current pump station is not adequate to provide enough pressure to the systems to irrigate all zones within the water window.

- Problem: According to the Campus Grounds Supervisor, the existing pump is currently restricted in its ability to provide the pressure required to irrigate all parts of the campus. A new pump station will be required; its specification will depend on the static pressure of the water source, irrigation design perimeters, existing landscaped areas, and new landscaped areas to be added to the campus.
- Remedy: Specify a pump system to handle the current and future needs of the entire campus.

H. The current water purveyor turns off the domestic water for multiple days in the summer months, causing major plant stress to all landscaped areas.

- Problem: The landscape is stressed at the worst possible (hottest) time of the year. When plant material draws water out of the soil profile, the amount of available stored water is reduced. When this percentage of water is reduced to a critical point called the Permanent Wilting Point, the plant suffers permanent damage and in some cases will not recover. This process occurs much quicker during the hottest times of the year.
- Remedy: Find a water source that can supply the campus as required during these critical times.

I. Various sizes of irrigation mains (4”, 6”) loop through the campus.

- Problem: Closed piping systems incur pressure losses within those systems as liquid flows through them. The larger the flows (demand), the higher the pressure losses will be per length of pipe. For irrigation sprinklers to operate within their manufacturer’s specified performances, they require a specified pressure. If the pressure reaching the sprinklers is less because of high flows through the piping, then the landscape suffers due to inefficient operation and coverage.
- Remedy: Determine the extent of reduced sized main lines on campus according to the demand (flow) and replace them with larger sized pipes. Main lines must be sized according to the demand required to run through them to keep pressure losses at a predetermined level. This should include current demand and all future demand so as to keep the systems working within the manufacturer’s specified performances.

J. Existing irrigation controllers are Rain Master DX radio controlled, with master computer in Grounds Maintenance office. The Grounds staff is currently very happy with this system.

- Problem: None. The Rain Master Central Control system is a top-of-the-line central system on the market. With its radio option setup, this system will allow additional controllers at most any location on the campus.
- Remedy: None.

K. No flow sensing devices are currently installed on any systems.

- Problem: Without flow sensing capabilities, the irrigation system operator does not have information at hand to determine how efficiently the irrigation systems are functioning or to make informed operating decisions as required. Flow sensing capabilities are an important water management tool. Flow sensing equipment works in conjunction with a master valve and has the following benefits.
  - Allows central control to read actual water delivered to the various zones. This information allows the operator to adjust the run times on the controllers to maximize water efficiency and plant health.
  - Monitors system operation, identifies pipe breaks and shuts down those systems automatically.
  - Monitors system operation, identifies a sprinkler(s) head break and shuts down those systems automatically.
  - Monitors unscheduled use of irrigation water and shuts down those systems automatically.
  - Monitors system operation and alarms the system operator when scheduled irrigation does not take place.

- Remedy: Install flow sensing equipment on irrigation sub-main lines at locations where the sub-main lines tie into the master main line. Currently, this would occur at the irrigation backflow locations. Sensing cables will also be required to run to the irrigation controllers. It is recommended that this cable be run in an electrical conduit.

L. No master valves are currently installed on any irrigation systems.

- Problem: An irrigation system without master valve shut off capabilities cannot take advantage of the flow sensing equipment's ability to monitor high flow events and shut down systems as required. A master valve is an important water management tool. Master valves work in conjunction with flow sensors.

- Master valves isolate pressurized water from the sub-mains they are attached to thus allowing no water flow during hours on non-operation.
- Master valves close down on command from the controller to keep pressurized water from flowing when the flow sensor has identified a break or broken sprinkler(s) in the system.

- Remedy: Install master valves on irrigation sub-mainlines at locations where the sub-mainlines tie into the master mainline. Currently, this would occur at the irrigation backflow locations. Two 24-volt wires will also be required to run to the irrigation controllers.

M. The close proximity of young children to any future non-potable water may be an issue. The current irrigation system surrounding the Child Care facility may remain as is.

- Problem: Non-potable water irrigating landscapes near kids may raise issues with YVWD or state rules and regulations. It also may raise issues with concerned parents.
- Remedy: The College will need to research any potential issues regarding the use of non-portable water. Another possibility will be to leave the existing irrigation systems near the Child Care facility on domestic water.

N. Many irrigation wires are broken throughout campus and the College is currently using Doublers to rectify the problems.

- Problem: Irrigation control wires get broken for a number of reasons—e.g., excavations within wire locations, tree root damage, new construction within wire locations, varmints, failure due to stretch stresses. The Grounds Department has used devices called 'Doublers' to help rectify the situation. Doublers allow the use of only one control wire to operate 2-4 irrigation valves. This is not an ideal fix, but it is an inexpensive one in light of the costs to run new wire through existing landscape and paving.
- Remedy: Run new control wire in new main line trenches where it makes sense to do so. Also run extra wires to alleviate future issues with broken wires.

O. On some parts of the campus the irrigation heads do not adequately water their intended target, due to low dynamic system pressures.

- Problem: For irrigation sprinklers to operate within their manufacturer's specified performances they require a specific dynamic pressure. If the dynamic pressure reaching the sprinklers is less than required then the landscape suffers due to inefficient

operation and coverage. Lower dynamic pressures can be a result of pressure losses through the system or low delivery pressures.
- Remedy: Increase dynamic pressure at the sprinkler by increasing main line pipe size where possible and/or increase delivery pressure.

P. Existing irrigation main lines are overtaxed. As the school adds new landscaped areas, the subsequent new irrigation is tied into the old existing main lines.

- Problem: Closed piping systems incur pressure losses within those systems as liquid flows through them. When landscape areas are added to the campus the increased water flow through the pipes for those new areas decreases the overall pressure within the system. The larger the demand becomes, the higher the pressure losses will be per length of pipe. For irrigation sprinklers to operate within their manufacturer's specified performances they require a specified pressure. If the pressure reaching the sprinklers is less because of high flows through the piping then the landscape suffers due to inefficient operation and coverage.
- Remedy: Determine the extent of reduced sized main lines on campus according to the demand (flow) and replace with larger sized pipes. Main lines must be sized according to the demand required to run through them to keep pressure losses at a predetermined level. This should include current demand and all future demands so as to keep the systems working within the manufacturer's specified performances.

Q. There are currently 9 reduced pressure (RP) backflow devices within the campus dedicated to irrigation systems.

- Problem: None. RP backflow devices are required by law on all domestic water irrigation installations with irrigation systems higher the installed backflow device. Irrigation backflow devices have an annual testing requirement by law. If non-potable water is delivered to the campus and YWSD allows it, the backflows may be removed, as the water is not domestic.
- Remedy: None. Removing backflow devices removes testing and maintenance costs.

R. There is not an approved backflow device separating the domestic water line from the irrigation water at the shipping and receiving area.

- Problem: RP backflow devices are required by law on all domestic water irrigation installations with irrigation systems higher the installed backflow device. If non-potable water is delivered to the irrigation zone and YWSD allows it, the backflow will not be required, as the water is not domestic.

- Remedy: Install a RP type backflow device if the irrigation system stays on domestic water.

S. The backflow devices are tied into various domestic water mains throughout campus.

- Problem: RP backflow devices are required by law on all domestic water irrigation installations with irrigation systems higher the installed backflow device. If non-potable water is delivered to the irrigation system and YWSD allows it, the backflows will not be required, as the water is not domestic.
- Remedy: None

T. Many of the current irrigation main lines are Asbestos Cement lined piping.

- Problem: Causes some issue with Grounds staff when they must do repairs on the piping. The irrigation main lines are of older vintage, not of the newer PVC style. The Grounds staff has indicated that these lines are in constant need of repair and they would prefer to work with non-asbestos cement pipe.
- Remedy: Abandon-in-place and replace all asbestos cement pipe as feasible. With use of non-potable water, required new main lines may solve this issue.

U. Approximate areas requiring irrigation:

- Problem: The current and future needs of the campus directly impact the water delivery requirements to the campus. See Table 1 for the Preliminary Water Use Estimate Chart. The chart is based on rough estimates of irrigation efficiencies and plant water requirements. To get more specific numbers at this time would require a full irrigation audit. The chart does not take into account any rain, which may fall on the site in a given year. Approximate areas requiring Irrigation are:
    - Golf and soccer fields: 30 acres
    - Campus landscaped areas (non-turf): 44 acres
    - Campus landscaped areas (turf): 9 acres
    - Roadside and miscellaneous landscape: 4 acres
    - Future construction: 5 acres

- Remedy: Negotiate water availability with the water purveyor.

Table 1
Preliminary Water Use Estimate Chart
Crafton Hills College, Yucaipa, CA

Assumptions: Total Estimated Irrigation Landscape Area = 92 acres (4,007,520 sq. ft.)

	ETo	PF	IE	Area (sq. ft.)	Rain	AR	Water Req. (inches)	Applied Irrigation Water Req. (inches)	Irrigation Water Req. (gallon)
JAN	2.80	0.65	0.60	4,007,520	0.00	0.00	1.82	3.03	7,577,330
FEB	2.80	0.65	0.60	4,007,520	0.00	0.00	1.82	3.03	7,577,330
MAR	5.00	0.65	0.60	4,007,520	0.00	0.00	3.25	5.42	13,530,946
APR	5.40	0.65	0.60	4,007,520	0.00	0.00	3.51	5.85	14,613,422
MAY	7.15	0.65	0.60	4,007,520	0.00	0.00	4.65	7.75	19,349,253
JUN	7.00	0.65	0.60	4,007,520	0.00	0.00	4.55	7.58	18,943,324
JUL	8.10	0.65	0.60	4,007,520	0.00	0.00	5.27	8.78	21,920,133
AUG	7.35	0.65	0.60	4,007,520	0.00	0.00	4.78	7.96	19,890,491
SEP	6.35	0.65	0.60	4,007,520	0.00	0.00	4.13	6.88	17,184,301
OCT	3.60	0.65	0.60	4,007,520	0.00	0.00	2.34	3.90	9,742,281
NOV	2.30	0.65	0.60	4,007,520	0.00	0.00	1.50	2.49	6,224,235
DEC	2.30	0.65	0.60	4,007,520	0.00	0.00	1.50	2.49	6,224,235
TOTAL	**60.15**				**0.00**	**0.00**	**39.10**	**65.16**	**162,777,280**

Reference:
ETo = Evapotranspiration Rate, water required by plants, in inches
PF = Plant Factor, as a percentage
IE = Irrigation Efficiency, as a percentage
Area = Irrigated Area, in square feet
Rain = Historical Average Rainfall, in inches
AR = Applied Rainfall, percent of rain that is affective

Water Required: Total water required by landscape = ETo * PF
Applied Irrigation Water Required: Water that must be added by irrigation system = (Water Required ÷ IE) – AR

E | DATA & COMMUNICATIONS

Crafton Hills - Technology Infrastructure Assessment

Introduction

In this report, the voice and data infrastructure serving the College is discussed as an integral part of the Architectural Master Plan. An overview of the existing campus technology infrastructure is presented with an evaluation of the existing as-built drawings and campus standards. The report identifies the critical areas of campus and building infrastructure that will have an impact on future installations of technology equipment and use. The goal of this report is to develop a structured, long-term view of the space and planning required for a comprehensive and flexible IT infrastructure. Though this process the College will ensure sufficient IT capacity to serve the technology build out of the campus while also effectively serving the needs of the master plan development.

The specific focus on supporting technology across the campus is not for the sake of using technology. The effort is made to ensure that the College's technology infrastructure is adequate to allow new technologies to be used that will help the College address its ultimate needs and goals required to provide a quality education to its students.

The IT infrastructure incorporated into the master plan should address long and short term needs in a cost-effective manner and should address the following:

- Technology Changes – The infrastructure must support ongoing changes such as increased network speeds and capacities, expanded use of monitoring and control systems and personal communication services.
- Distribution – The infrastructure should enable access to every Campus building and every area of the Campus, providing redundant routing wherever practicable.
- Adaptability – The infrastructure should be designed to allow a high degree of flexibility and adaptability.
- Standards Based – The infrastructure should adopt a standards based approach to provide the capability to utilize a wide range of alternative system designs without the need to reinvent the basic infrastructure.
- Fault Tolerance – The infrastructure should be designed to allow for the installation of a fault tolerant network configuration.

Data Network

The campus data network operates on a Gigabit campus backbone running over 62.5 optical fiber cabling and Gigabit over copper cabling in the internal riser with 100Mbit/s Fast Ethernet horizontal distribution over copper cabling within each building. There are two outlying campus locations that exceed the distance limitations for Gigabit backbone distribution over multimode fiber. These are the Maintenance Building and the communications tower. The College recognizes that the installation of single mode optical fiber will be required to each of these locations for the backbone to be increased from 100Mbit/s Fast Ethernet to Gigabit.

There is currently no physical redundancy in the network, i.e. there is only a single network path between the network center in the LRC and any individual building. The network is connected in a star configuration.

The network provides wide area connectivity to the San Bernardino Valley campus and to the District via a 100MB wireless Microwave connection. Internet connection is made via a DS-3 connection to the CalREN network.

There are currently two locations with wireless network deployed on campus using an 802.11b/g solution. Concerns exist over the cost/benefit equation for wireless connections, and widespread concern over security of the wireless network. The staff mainly uses desktop workstations and very few students or faculty use mobile laptop computing so the usual benefits of a wireless network cannot be realized. A district wide plan for the installation of wireless networking should be established.

Telephone System

The campus upgraded the telephone system and transitioned from a traditional TDM Meridian telephone system to the use of a Cisco AVVID Voice over IP (VoIP) system in 2004. The Cisco AVVID system is the current standard telephone system service type deployed at San Bernardino Valley College and the District offices.

The campus VoIP system currently supports all telephone users providing such services as audio conferencing and voicemail. Limited direct outside telephone lines are used for connections traditional telephone system connections and fax modem use.

The migration to VoIP has been successfully completed and the system is considered reliable by campus faculty and staff. Supporting continued telephone connections during the event of an extended power failure is a concern with the VoIP system. The data network equipment which supports the telephone system function must be powered for continued telephone service. Currently modular UPS devices are used in the campus data center and in individual telecom equipment rooms to provide back up system power. The UPS equipment provides back up power for a maximum of 1 hour.

CATV / Video Distribution

The College does not currently have CATV distribution at this campus. The District's Valley campus has television studios and a cable channel, KVCR. However, no links between the two campuses provide distribution of cable channel programming. Adding a CATV distribution feed to the campus should be considered. Other college's use CATV programming to maintain world events and for entertainment. Because no campus backbone coaxial cabling exists currently the distribution of CATV over optical fiber should be considered. The CATV signal may be distributed over optical fiber using the data network or by broadband distribution over fiber.

The use of live and recorded video streaming over the data network should also be considered. Further discussion of the future use of distance learning between the two San Bernardino Community College District campuses is required. (Use and requirements of such functions will be discussed as part of Master Plan programming.

Technology Infrastructure, As-Built Drawings and Campus Standards

The College has a collection of building and campus project as-built drawings that have recently been compiled as part of the campus master planning project. The majority of these historic drawings do not indicate locations of technology equipment rooms, communications pathways or communications cabling outlets in buildings. The majority of the technology equipment and communications cabling installations were completed after the buildings were constructed and have no formal record documentation. Drawings do exist for the campus communications infrastructure ductbank routing and the information is clearly detailed on the Utility drawings. However, campus as-built drawings for the campus backbone optical fiber air-blown cable system or the campus copper cabling do not exist. The campus Technology Services department has created a drawing that details cable types and quantities for these installations. (This report includes drawings of the campus backbone cabling installations and campus technology infrastructure.)

The campus does not have a list of formal defined technology standards. However, the District has installed similar Cisco active networking and VoIP equipment and communications cabling types at each campus. The renovation projects to be completed at Crafton Hills College and other District locations will benefit from the completion of technology infrastructure, equipment and cabling standards documents. It is recommended that such standards be completed as part of the master planning effort.

Campus Data Center

Figure 1 – Data Center Server Racks. Rack expansion space or three racks exists adjacent to these shown.

Figure 2 –Equipment consolidation will provide additional equipment rack space in existing data center racks.

Figure 3 –UPS in data center provide back up power for the campus data network and VoIP telephone system.

Figure 4 –UPS in data center provide back up power for the campus data network and VoIP telephone system.

<u>Main Equipment Rooms</u>

Campus MPOE

The campus currently has a hardwired incoming services connections provide by Verizon. The incoming services connection is made with 24 strands of optical fiber extended from Verizon's Mentone Central Office location. The incoming service route runs from the west entrance at Sand Canyon Road to the Library/LRC building for fiber connections and to the LADM building for copper connections. The incoming service lines are used to distribute internet and telephone system connections.

Campus Data Center

The campus data center is currently housed in the basement of the Library/LRC building. The room is approximately 600 square feet in size. The room currently has expansion space of approximately two equipment racks in each of its two rows in its current configuration. A portion of the existing servers consist of traditional cabinet style chassis and are installed on shelves in racks. This equipment will be replaced with servers that are significantly smaller in size which will allow for equipment consolidation. Further expansion space could be provide by consolidated existing equipment and removing the existing work bench and stored equipment space.
As technology continues to evolve and develop, the necessity for sophisticated equipment in the data center will continue to increase. Space in data center will continue to be at a premium for years to come, and the requirements for closely controlled environmental conditions will become more and more important.

An additional HVAC unit was recently added to provide continued room cooling. The data center now has two independent cooling units providing a total of 9 tons of air conditioning. Back-up power in the data center is supported by individual rack mounted Uninterruptible Power Supply (UPS) associated with specific equipment. No generator exists to provide emergency power. It is recommended that an emergency generator be added.

The data center does not have significant fire protection currently with the minimal installation of sprinklers required for the square footage. The majority of data center equipment would be damaged in the event of a basement located fire that allowed the sprinklers to discharge in the data center. The installation of a gas fire suppression system should be considered if this space will remain as the centralized location of data network equipment.

The build-out of a new campus data center is recommended as part of the campus improvements. A new data center would allow for a proper built room with future expansions space and all required support services. The existing data center should remain as a redundant core equipment location providing network redundancy.

Technology Equipment Rooms

Figure 1 – View of communications equipment located in an exposed area beneath a credenza area of a classroom.

Figure 2 – Example of a worst case scenario communications equipment location - mechanical room install.

Figure 3 – Wall mounted equipment racks serve as cable distribution points and house communications equipment.

Figure 4 – Wall mounted communications equipment and cable distribution in an electrical equipment room.

Building Dedicated Technology Equipment Rooms

Each main campus building has at least one dedicated telecom equipment space allowing for equipment installation for the provision of campus telephone and data services to outlet locations throughout the building.

Typical BDF/IDF Telecom Equipment Rooms

BDF (Building Distribution Facility) and IDF (Intermediate Distribution Facility) equipment rooms are used to house telecommunications equipment and for cabling distribution. BDF rooms are special-purpose rooms that provide space and maintain a suitable operating environment for the termination of backbone and campus cabling and house centralized communications and/ or computer equipment. The BDF is a buildings main communications equipment room where incoming campus services are connected.
Backbone cabling extends from the BDF location to IDF equipment rooms for distribution of services throughout the building. IDF rooms provide an environmentally suitable and secure area for installing cables, cross-connects, rack- and wall- mounted hardware and technology equipment. These rooms are connection point between the backbone and horizontal pathways.
With few exception the BDF and IDF rooms across the campus are not purpose built rooms dedicated solely to telecommunication installations. Instead communications equipment is collocated in mechanical or electric rooms or located in cabinets or shelves in classroom locations. The existing campus buildings were not constructed with dedicated telecommunications rooms and do not provide equipment spaces that meet current industry standards. These types of installations do not allow for technology equipment expansion or significant upgrades and should be replaced with purpose built equipment rooms.

Communications Equipment Room – Support Systems

Per industry standards communications rooms should have either dedicated HVAC equipment, or access to the main HVAC delivery system. Telecommunications equipment requires the HVAC system to function 24 hours per day, 365 days per year. Sudden temperature changes and extreme temperatures can cause equipment shut down and shorten the life span of equipment.
The majority of communications equipment rooms at the College do not have dedicated or building HVAC distribution.

It is recommended that the communications equipment rooms at new and renovated buildings be built to provide dedicated space, power, and HVAC to allow for multiple generations of future equipment and cabling installations. Communications room requirements should be standardized across the district and room requirements should be issued to the Architectural and engineering teams for each building construction project.

Building Communications Cabling Pathways

Figure 1 – Exposed cables are routed along walls and ceiling areas.

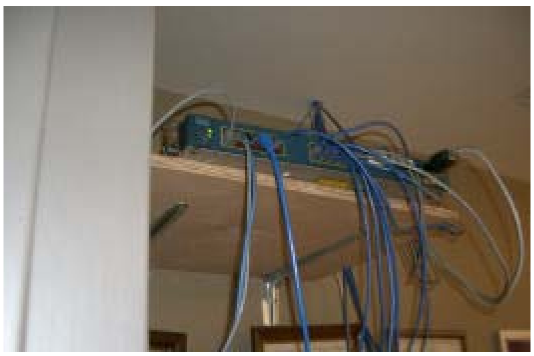


Figure 2 – Cable is distributed from an equipment location through a hole in the ceiling and to outlet locations.

Figure 3 – Conduit is used for horizontal cable distribution in few locations.

Figure 4 – View of wall mounted cable terminations and conduit distribution paths.

Building Dedicated - Communications Riser and Horizontal Pathways

The horizontal communications cabling system infrastructure includes the pathway and support hardware which concentrates, supports and protects horizontal cable media between its origination point in the equipment room and the workstation outlet location. The riser pathway supports backbone cable distribution between stacked floors. The existing campus buildings were not designed with horizontal or riser cabling pathways. As a result cabling is distributed using wall mounted hooks, wiremold cable containment or otherwise surface mounted.

Riser pathways at buildings with multiple floors have been cored where possible. However, there are few instances where communications equipment rooms stack on one another that allow the cored riser pathway to be most beneficial. Horizontal pathways have been created with the use of j-hooks in accessible ceiling spaces or placed above ceiling tiles with no containment method. This type of installation does not provide for cable protection and does not allow cable to be replaced efficiently. Cable replacement will cause significant disruption in these spaces.

It is recommended that new riser and horizontal pathways be installed as part of existing building renovations. New pathways should be based on a District standard for distribution requirements.

Building Cabling

The majority of telecommunication outlets throughout the College consist of enhanced Category 5 cabling and connectors. These outlets are used to connect computers, VoIP telephones and peripheral equipment to the campus data network. The cabling currently supports 100Mbit connection speeds to the data network. It has not yet been determined if these cable installations will support 1000Mbit speed connections.

The cabling is generally in good condition but is exposed in many classroom installations. It is recommended that new and renovated buildings include dedicated pathway infrastructure for the distribution of communications. The District is working to standardize on the installation of AMP Category 6 cabling. It is recommended that a standard cabling specification and installation design be developed for use by Architectural and engineering design teams working on new and renovated building projects.

Campus Communications Infrastructure

Figure 1 – Distribution from manhole connects campus communications services to data center equipment.

Figure 2 – Incoming services route through manhole located at the LADM building.

Figure 2 – Manhole location at bookstore is the southern end of campus communications infrastructure spine.

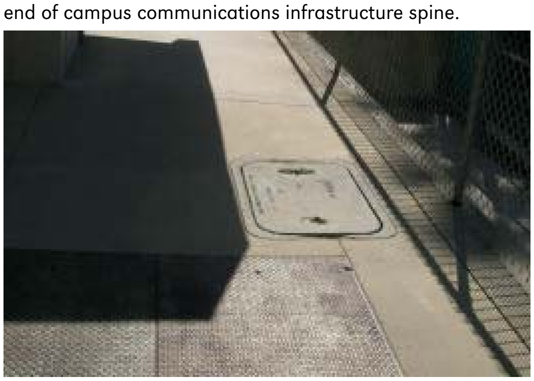


Figure 2 – Pull box at Gymnasium location. Communications cabling is routed through Electrical vault.

Campus Communications Infrastructure

The existing campus communications cabling pathways consist of conduit duct banks, manholes and pull boxes. Access at infrastructure pathways is made at manholes and pull boxes for cable servicing and installations. Duct banks consist of 3 or 4 inch trade size conduits running between backbone manhole and pull box locations. Smaller conduits of 2 inch trade size are typically run from manhole or pull box locations to building main equipment rooms for connection to campus telecommunications services. (See attached Campus Technology Infrastructure and Communications Cabling drawings for details.)

A single spine of campus conduit exists which runs from the West end of campus starting at the College Center and extends up to the Book Store building. The duct bank path runs in the area between the parking lots and campus buildings. Conduit duct banks are located in open areas and do not run under buildings at any portion of the run. The manholes are pre-cast concrete and sized at approximately 6'wide by 10' in length x 6'in depth. They are in good condition but have standing water in most locations. It appears that irrigation water drains into the manholes requiring them to be pumped multiple times each year. The flow of water into manholes may be reduced by providing new seals at lids, bolting lids and sealing any crack in manholes.

The main campus duct bank consists of (2) 4" and (3) 3" conduits encased in concrete. The conduits at the central spine area are in generally good condition but close to capacity with the current cabling installations. A portion of conduit pathways contain copper telephone cabling that has been abandoned. Removal of abandoned cable will help to provide usable conduits for future cabling installations.

In addition to the center spine conduit pathway running between the parking lots and building locations, there is a conduit duct bank running the main campus drive. This duct bank has been in place since the initial campus construction was completed. The majority of these conduits are currently unused for distribution of campus backbone communications cabling. A portion of these duct bank conduits are congested with overgrown with tree roots. This conduit pathway may be used as a redundant path to mitigate having a single point of failure in the center spine conduit path. However, the existing conduit pathway should be replaced with a new concrete encased conduit pathway to prevent future conduit or cable damage from tree roots.

It is recommended that as part of the campus master plan that additional campus main duct bank routes be added to increase capacity and provide for route redundancy for backbone cable distribution. This redundancy will help to eliminate any single point of failure location in the campus backbone which would leave a group of buildings without campus communications services in the event of a duct bank disruption.

Campus Communications Cabling

Figure 1 – Air blown optical fiber tubes extend from campus infrastructure to building equipment rooms, as seen here.

Figure 2 – Air blown optical fiber tubing originates here in the Library/LRC building.

Figure 3 – Backbone cabling and fiber tubes exit the Library basement

Figure 4 –Communications equipment room with wall-mounted campus backbone cabling (copper & fiber).

Campus Backbone Cabling

The College has an installation of air blown fiber pathways running throughout the campus infrastructure. The fiber pathway originates in the Library/LRC building and extends to each building on campus. The air blown fiber system is a series of tubes connected to allow for the installation of optical fiber. Fiber is placed in the tubes using a stream of compressed air. The use of this type of cabling system provides an infrastructure that can be used and reused for generations of cabling. When a fiber type requires replacement the existing fiber strands are removed and new fiber is installed in the same tube. The installation maximizes the infrastructure capacity.

The existing optical fiber installed consists of multimode 62.5 micron and is connected using Opti-jack connectors. Fiber strands are terminated in wall mounted or rack mounted termination panels at each building.

The backbone copper cabling installed across the campus is now in limited use as the majority of telephone signals are distributed over backbone fiber cabling using the new VoIP system. The copper cabling is still used to connect outside phone lines to fax modems and direct line phones.

Legacy copper air core cabling has been abandoned in place and limits conduit capacity at incoming service duct banks. Campus duct bank capacity will benefit from the removal of abandoned cabling.

It is recommended that the campus standardize on the use of 50 micron multimode optical fiber for campus backbone cabling. This fiber will provide for increased bandwith in the transition to a 10Gigabit backbone. Single mode optical fiber should be installed to buildings that have a cable distance greater than 500 meters from the data center.

The technology requirements on Campus are continually evolving and an expected emphasis will be on

- An increasing number of computers on Campus typically concentrated in computer labs.
- Increasing demand for Internet access.
- Increasing demands for access to personal communication including telephone and intercom, including wireless access.
- Increased use of remote monitoring and control systems.
- The potential for distribution of video across the network.

Wireless voice and data communications is likely to play a role in the future of the campus technology requirements, but in the near term strategy for a role-out of wireless networking has not been completed.

Key Aims and Assumptions for the Development of the Infrastructure plan

The following key points underscore the planning for the development of the IT Infrastructure on Campus.

- The plan should identify a backbone infrastructure route that serves, but is separate from, the current buildings and the sites of future buildings as identified in the master plan. This approach will facilitate the renovation and construction of campus buildings in any sequence without interruption to voice and data network services.
- The infrastructure should be designed for construction in stages to minimize initial cost. The infrastructure plan will ensure that the component constructed at each stage forms a viable part of the final campus wide infrastructure.
- The infrastructure will reflect the increasing operational dependence on the network and aim to provide physical and logical network redundancy.
- Existing infrastructure that is in good condition and with a long lifespan should be retained and incorporated into the long-term plan in order to reduce costs.
- The Data Center will continue to occupy the current space in the Library/LRC in the near future. However, planning for the IT infrastructure will emphasize the move of data network equipment to a new data center location leaving the existing data center as a location for redundant core equipment.

Classroom Audiovisual Systems

Figure 1 – Example of newer instructor media station with dedicated computer and document camera.

Figure 2 – Push button AV control panel at instructor station allows for equipment selection and volume control.

Figure 3 – Example of legacy instructor station, generally larger in size.

Figure 4 –Instructor station DVD and VHS source equipment. Source images are displayed via ceiling mounted

Educational Technology

The College makes use of installed and portable audiovisual (AV) equipment in classrooms and conference rooms. New classrooms include a dedicated instructor station that houses a dedicated computer, document camera and source equipment. Video and computer Images are displayed to the student audience with the use of a single ceiling mounted projector and projection screen. The system has a push button control panel at the instructor station which allows for the selection of computer and video sources to be shown on the projection screen. The control panel also allows for volume control of audio distributed by wall mounted speakers. Other classrooms make use of portable projection equipment for electronic image display. Portable slide projectors and overhead projectors are used for film projection.

It is recommended that the College and District work to standardize the AV requirements for typical classroom types. AV room standards would be used by design teams planning construction for renovated and new buildings. Standards should emphasize the use of conduit infrastructure that will be used to install cabling between day one and future equipment. System requirements such as controls and ALS equipment should also be standardized. The standards should include methods for centralized monitoring capabilities of AV systems that will allow for remote help and support for faculty.

F | SITE & BUILDING LIGHTING

01 LIGHT LEVELS

Figure 1.1 – Street lighting - restricted height and wide spacing lead to uneven lighting.

Figure 1.2 – Child Development parking – Low, sparse fixtures inadequate for area of parking lot.

Figure 1.3 – Library perimeter – adequate lighting along building fades to unilluminated landscape.

Figure 1.4 – Service road - unilluminated

Light Levels
(Security/Safety)

The amount and evenness of light reaching the ground are two of the most important factors in creating a safe nighttime environment. Around building perimeters these are predominantly acceptable. However, notable exceptions included:

- Street lighting is very uneven, and crosswalks are not highlighted and do not employ reflectors or reflectorized tape.
- Parking lots have variations in light levels exceeding 10-to-1, and drop to 0.1 foot-candles or lower in many perimeter areas.
- Landscape areas in plazas and around parking lots and pathways are not illuminated in many areas, creating hiding spaces for animals and or people. (This includes the park at the corner of Campus Drive and the road to the Maintenance Facilities.)
- Service roads are totally unilluminated. Some of these are in areas where students or parents may travel (such as up to the practice field,) potentially on foot and by automobile.
- Stairs at some locations are not specifically illuminated, posing a trip hazard.
- The sports field is only illuminated using portable light fixtures, which could potentially lose power during use.
- Many building entries are not illuminated to higher levels, as recommended by the Illumination Engineering Society of North America (IESNA.)

01 LIGHT LEVELS

Figure 1.5 – Bookstore - Stairs illuminated by building mount fixtures (off during site walk.)

Figure 1.6 – Sports field – Portable floodlights inadequately illuminate area.

Light Levels, cont'd
(Security/Safety)

- Around building perimeters these were predominantly acceptable. However, notable exceptions included:
    - Stairs at some locations are not specifically illuminated, posing a trip hazard.
    - The sports field is only illuminated using portable light fixtures, which could potentially lose power during use.

02 GLARE

Glare
(Security/Safety)

Glare is one of the major detrimental factors to visibility at night. When there is direct view of a very bright light source, the viewer's retinas contract, letting in less light in order to protect his eyes. This has the effect of making his entire view appear darker and impairs the effectiveness of these fixtures.

- Fixtures using visible lamps (including pole lights, wall packs, and floodlights) actually reduce visibility.

Figure 2.1 – Wall pack with prismatic refactor – visible lamp partially blinds pedestrians.

Figure 2.2 – Post top at top of stairs – Pedestrians see into fixture when ascending stairway.

Figure 2.3 – Student Services – floodlight illuminating stairs partially blinds pedestrians.

Figure 2.4 – Ceiling mount fixture – where visible, fixture is major source of glare.

03 COLOR RENDERING

Figure 3.1 – Street lighting – low pressure sodium source emits light in only two wavelengths.

Figure 3.2 – Metal halide – this is a moderate to good color rendering source.

Figure 3.3 – New wall sconces – These use flourescent, for moderate to good color rendering.

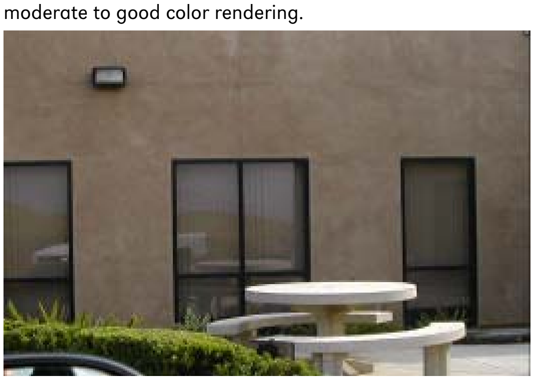


Figure 3.4 – High pressure sodium – Environments appear various shades of gold and brown.

Color Rendering
(Safety/Security)

Color rendering is a major factor in visibility (and thus the utility of fixtures depending on the light sources used in particular fixtures.) High color rendering fixtures render all colors fairly accurately (reds are reds, blues are blues, etc.) Low color rendering sources can be somewhat monochromatic, making it difficult for people or objects to stand out from their backgrounds or for viewers to identify exactly what or who is being seen.

Currently:

- Low pressure sodium is currently being replaced by induction lamp fixtures in parking lots and roadways. Low pressure sodium is the absolute worst color rendering source available and should only be used where required by nearby observatories, etc.
- High pressure sodium is being used in wall packs at some locations (Childhood Development, etc.) This renders most colors as gold or brown.
- Metal halide, fluorescent, and incandescent sources throughout the site use moderate to good color rendering lamps.

04 FACADE LIGHTING

Figure 4.1 – Sconces scatter light, including upon buildings across courtyards.

Figure 4.2 – Building integrated lighting serves to illuminate building as backdrop + surrounding.

Figure 4.3 – Building mount uplights illuminate tower and night sky.

Façade Lighting
(LEED/Security)

Illumination of building facades not only adds to the ambiance of the college., but it also improves safety by providing a bright backdrop against which people and animals will stand out and eliminating nooks and crannies in which someone might disappear.

Currently:

- Sconces scatter light in all directions, effectively floodlighting buildings and providing illuminated backdrop to walkways and plazas.
- Incorporated light fixtures illuminate façade as well as area below.

05 LANDSCAPE LIGHTING

Figure 5.1 – Landscape uplight is a source of light pollution, when functional.

Figure 5.2 – Non-illumination of landscape surroundings leads to dark areas.

Landscape Lighting
(LEED/Security)

Illumination of landscaping (either by highlighting large trees or the use of area lighting via pole lights) can not only add to the ambiance of the college, but it also improves safety by providing a lighted backdrop against which people and animals will stand out and eliminating nooks and crannies in which someone might disappear.

- No functioning landscape lighting currently exists, leading to dark surroundings to campus.
- Nonfunctioning bullet uplights would be source of light pollution if operable.

06 SIGNAGE

Figure 6.1 – Parking signage – illuminated only by vehicular headlights

Figure 6.2 – Flags – currently unilluminated

Signage
(Wayfinding)

Illumination of signage at night makes it much easier for new students, or students seeking an unfamiliar building, to find their way around and not get lost.

Currently:

- Building identity signs are internally illuminated
- The main monument sign (at Campus Drive and Sand Canyon Road) is floodlighted
- The monument sign at the bus turnaround has inadequate number of floodlights, which are currently not functioning.
- Parking lot signage has no illumination.

07 VANDAL RESISTANCE

Figure 7.1 – Non-vandal resistant sconce located too close to ground.

Figure 7.2 – Most older lensed steplights are no longer functioning.

Figure 7.3 – New sconces do not employ screws or other fasteners to hold bottom panel in place..

Figure 7.4 – Ground mount landscape lighting should be provided as durable floodlights.

Vandal Resistance

College campuses can be high abuse environments. Fixtures should be kept out of reach wherever possible, and when this is not possible, vandal resistant fixtures should be used. However, polycarbonate lenses should be avoided, as this material yellows quickly and becomes brittle.

Currently:

- Fixtures that are not rated as vandal resistant are sometimes located within easy reach.
- Steplights with lenses rather than grills have been provided and have not stood up to abuse.
- There are removable parts on some fixtures, which will disappear or be damaged.

08 LIGHT POLLUTION


Figure 8.1 – Wall pack with prismatic refractor – Light is distributed up as well as down.


Figure 8.2 – Fluorescent sconce – Light is scattered in all directions.


Figure 8.3 – Cut-off optics – Light is directed only below horizontal

Light Pollution
(LEED)

LEED requirements state that true cut-off fixtures should be used in all cases and that uplights should not be used if it cannot be guaranteed that no light pollution will be created.

Currently:

- Most fixtures on site do not use cut-off optics, causing a lot of light to be discharged directly into the night sky.
- Many newly installed fixtures do not use optics at all but simply scatter light in all directions.

09 SOLAR POWERED FIXTURES


Figure 9.1 – Cobra head fixtures collect solar energy during the day.


Figure 9.2 – Fixtures cannot store enough energy to last entire night during the winter.


Figure 9.3 – Some fixtures currently not operating at all.

Solar Powered Lighting
(LEED)

The use of renewable energy sources, including solar, can add to LEED accreditation. Currently, some solar powered light fixtures are installed about the campus.

- Benefits include:
  - Fixtures do not require power from Utilities and so save on energy consumption/cost.
  - Fixtures are not affected by campus-wide power failures.
- Drawbacks include:
  - Fixtures cannot store enough energy to last an entire night during winter (this is affected by their placement on buildings, i.e., how much sunlight they receive during the day.)
  - Fixtures are not architecturally integrated but stick out obviously.

LIGHTING -
11x17 DIAGRAM - SITE LIGHTING

LIGHTING LEVEL SITE MAP
– KEY –

COLOR	AREA TYPE	IES RECOMMENDED LIGHT LEVELS (avg.)	IES RECOMMENDED UNIFORMITY (max: min)	MEASURED LIGHT LEVELS	MEASURED UNIFORMITY (max: min)
	PATHWAYS	0.5fc	4:1	5.0 to 0.1	1:1 (best) 20:1 (worst)
	BUILDING ENTRIES	5.0fc (min.)	n/a	15.0 to 0.3	–
	PARKING LOTS	0.9fc (min.)	4:1 (avg: min)	8.8fc to 0.1fc	13:1 (best) 88:1 (worst)
	ROADWAYS	0.8fc	5:1	3.5 to 0.1	35:1
	SPORTS (TENNIS)	100fc (collegiate) 50fc (high school)	2.5:1 4:1	50fc+ (estimated)	2.5:1 (estimated)
	SPORTS (SOCCER)	150fc (collegiate) 50fc (high school)	2.5:1 4:1	–	–
	LANDSCAPE	none	none	0.5 to 0.0	–

LIGHTING -
11x17 DIAGRAM - TROUBLE SPOTS

01 OVERVIEW

Figure 1.1 – Fixtures with cut-off optics not only reduce light pollution but can achieve greater illumination levels.

Figure 1.2 – Sodium light sources render all colors as gold, brown, or black, thus reducing visibility.

Figure 1.3 – High color rendering sources render color in all wavelengths of the visible light spectrum.

Figure 1.4 – Cut-off light sources use recessed optics that prevent view of lamps except from directly below.

Overview

Based on a review of the existing lighting on the site the following general items should be addressed:

- Where they fall below recommendations from the Illuminating Engineering Society of North America (IESNA,) light levels should be increased to meet minimum standards. This can be achieved through the replacement or addition of light fixtures.

- Where light levels have been designated as particularly uneven (streets, parking lots) replacement fixtures should be provided that meet IESNA minimum recommendations.

- In order to provide improved color rendering (i.e., visibility) fluorescent, induction lamp, and metal halide sources should be used with a color rendering index (CRI) of 80 or higher.

- Fixtures that currently produce high amounts of glare should be replaced with full cut-off fixtures where optical control is imperative and diffuse, low brightness fixtures where unsophisticated optics are required.

- In order to meet LEED requirements, all future landscape or façade-mounted lighting should employ true cut-off optics in order to minimize light pollution.

Specific recommendations will be made by area and fixture in the following sections.

02 STREETS

Figure 2.1 – Fixtures with high performance optics are available in many shapes and sizes. (USArchictectural DSB)

Figure 2.2 – Fixtures with high performance optics are available in many shapes and sizes. (Kim Archetype)

Figure 2.3 – Fixtures with high performance optics are available in many shapes and sizes. (AAL Largent)

Street Lighting

Main Road

The current street lighting on the campus:

- falls below IESNA minimum light level recommendations (0.8 foot-candle average)
- is far less uniform that IESNA worst-case recommendations (5-to-1 max-to-min ratio)
- uses a very poor color rendering light source (low pressure sodium, which emits light in only 2 wavelengths.)
- uses fixtures that are not full cut-off.

This lighting is currently being replaced with fixtures that employ a high color rendering induction lamp. This may be appropriate if these are provided as full cut-off fixtures and IESNA minimum requirements will be attained.

In any case:

- High color rendering lamps are recommended. (Metal halide is suggested, as much better optical control is achievable with it.)
- Fixtures should be spaced so as to achieve IESNA recommendations of 0.8 foot-candle average or greater, and 5:1 max:min ratio or better. This can be done by:
    - Decreasing the distance between fixtures
    - Increasing pole heights
    - Using fixtures with well-designed type I or type II reflectors

02 STREETS

Figure 2.5 – Crosswalks on campus are currently poorly illuminated.

Figure 2.6 – Strategically placing pole lights at crosswalks not only provides illumination but helps define path.

Figure 2.7 – In-grade paver lights help define pedestrian path of travel.

Figure 2.8 – Driveover paver lights can integrate grazing/spray type optics to minimize light pollution.

Street Lighting (cont'd)

Crosswalks

In addition, crosswalks should be more brightly illuminated to increase visibility of pedestrians for drivers.

This can be done by:

- Providing reflectors or reflectorized paint at cross-walks.
- Providing additional light fixtures at either ends of cross works.
- Integrating recessed marker lights with cross walks.

Service Roads

Service roads are currently unilluminated. These should be illuminated to minimal requirements of:

- 0.3 foot-candles (average)
- 10:1 max:min

03 PARKING LOTS

Figure 3.1 – Evenness is even more important than light levels in aiding visibility.

Figure 3.2 – Fixtures with high performance optics are available in many shapes and sizes. (Kim Entablature)

Figure 3.3 – Fixtures with high performance optics are available in many shapes and sizes. (ASL Eurotique)

Figure 3.4 – Fixtures with high performance optics are available in many shapes and sizes. (Kim Matrix)

Parking Lot Lighting

The current parking lot lighting on the campus:

- falls below IESNA minimum light level recommendations (0.9 foot-candle minimum)
- is far less uniform that IESNA worst-case recommendations (4-to-1 avg-to-min ratio)
- uses a very poor color rendering light source (low pressure sodium, which emits light in only 2 wavelengths.)
- uses fixtures that are not full cut-off.

This lighting is currently being replaced with fixtures that employ a high color rendering induction lamp. This may be appropriate if these are provided as full cut-off fixtures and IESNA minimum requirements will be attained.

In any case:

- High color rendering lamps are recommended. (Metal halide is suggested, as much better optical control is achievable with it.)
- Fixtures should be spaced so as to achieve IESNA recommendations of 0.9 foot-candle minimum or greater, and 4:1 avg:min ratio or better. This can be done by:
    - Decreasing the distance between fixtures (by adding additional fixtures as required)
    - Increasing pole heights
    - Using fixtures with well-designed reflectors

In many cases there are wooded areas directly adjacent to parking lots. These create places predators (human or animal) might lay in wait. Because of this it is recommended that the zone of this landscape within 20’-0” of the parking lot be treated as parking lot as far as designing to meet IESNA criteria.

04 PEDESTRIAN PATHWAYS


Figure 4.1 – Fixtures with high performance optics are available in many shapes and sizes. (Bega 8082)


Figure 4.2 – Fixtures with high performance optics are available in many shapes and sizes. (Kim Era)

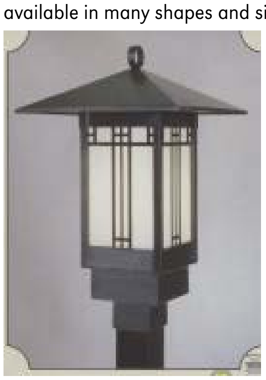


Figure 4.3 – Fixtures with high performance optics are available in many shapes and sizes. (Sternberg Artisan)


Figure 4.4 – Fixtures with high performance optics are available in many shapes and sizes. (ASL Eurotique)

Pedestrian Pathways

Pole Lights

The current pathway lighting on the campus:

- falls below IESNA minimum light level recommendations (0.5 foot-candle average) in most areas not directly adjacent to buildings
- uses a wide variety light sources of different energy efficiency and lamp life
- uses some fixtures that are full cut-off and others that are very inefficient and sources of light pollution and glare.

This lighting is currently being replaced with fixtures that employ a high color rendering induction lamp. This may be appropriate if these are provided as full cut-off fixtures and IESNA minimum requirements will be attained.

In any case:

- High color rendering lamps are recommended. (Metal halide is suggested, as much better optical control is achievable with it.) Using a minimum number of lamp types will ease maintenance.
- Any fixtures provided should use full cut-off optics. This will both:
    - Minimize glare
    - Minimize light pollution and so require with LEED criteria and the 2005 Title24 requirements
- Fixtures should be spaced so as to achieve IESNA recommendations of 0.5 foot-candle average or greater, and 4:1 max:min ratio or better. This can be done by:
    - Decreasing the distance between fixtures
    - Increasing pole heights
    - Using fixtures with well-designed reflectors

Current fixtures on campus do not seem to have been selected with a mind to aesthetic integration with the architecture of the buildings and hardscape. Many options are available at this point in time that can meet both performance and aesthetic criteria.

04 PEDESTRIAN PATHWAYS

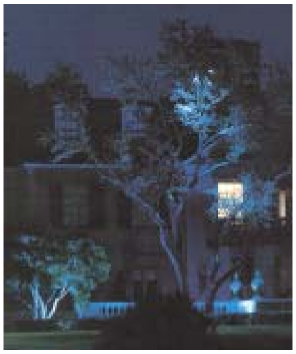


Figure 4.5 – "Moonlighting" – Fixtures mounted high in trees can provide area lighting as well as landscape illumination.

Figure 4.6 – Large scale decorative fixtures can be provided to illuminate landscape as well as pathways.

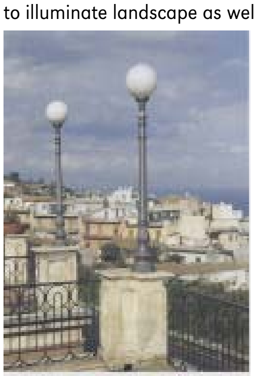


Figure 4.7 – Post top fixtures can be integrated with hardscape elements.

Pedestrian Pathways (cont'd)

Landscape-mount Area Lighting

An alternative to the use of pole lights (or building mount fixtures where pathways run along structures) is to use tree mount downlights. There are many very tall trees on campus, and the use of these for "moonlighting" pathways in this manner also can serve to illuminate the trees themselves, providing landscape lighting (covered in a later section.)

Plaza

Currently this area is illuminated with a few pole lights mounted at the north, east, and south ends of the plaza. This results in uniformly low light levels across the majority of the walkway. Lighting integrated into the four landscaping rectangles provides almost no illumination (and is currently not functioning.)

Recommendations are to either:

a) provide one large pole in the center of each landscape quadrant (this will serve to both illuminate the short trees below and the plaza beyond,) or

b) provide pedestrian scale pole lights at the corners of the landscape rectangles that will illuminate the plaza and the landscape bed.

RECOMMENDATIONS

05 STAIRWAYS


Figure 5.1 – Where pole lights are located at tops of stairs, they can be sources of glare for those ascending.


Figure 5.2 – Although this is a fairly sturdy installation for this type of fixture, it is an easy target for vandals.


Figure 5.3 – Steplights with polycarbonate lenses will eventually fall to vandalism.

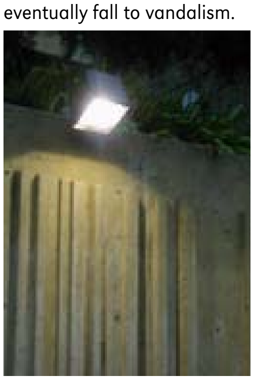


Figure 5.4 – Glare from floodlights actually counteracts the illumination they provide.

Stairway Illumination

Existing Conditions

Currently the stairways are illuminated using one of the following types of fixtures/techniques:

- pole light fixtures (Where these are mounted at the top of stairs, those ascending have a view directly into the extremely bright lamp.)
- landscape mushroom lights (Although they seem to be undamaged for the most part, these are an easy target for vandals.)
- steplights employing polycarbonate lenses (These lenses were selected for their vandal resistance, but they become opaque and brittle under prolonged exposure to the sun.)
- flood lights (These are a high source of glare and so reduce visibility.)
- bollards (These are an easy target for vandals, and only fixtures specifically designed to be vandal resistant should be used.)
- building mount downlighting (partially concealed by integration in coffered ceiling)
- spill light (Some stairs do not have fixtures adjacent but rely on light from nearby buildings, parking lot lights, etc.)

It is recommended that vandal resistant, non-glare fixtures be provided for all stairways. The most critical areas for illumination are the top and bottom of the stair and any landing, as that is where pedestrians are most likely to trip (due to the change in slope.)

05 STAIRWAYS

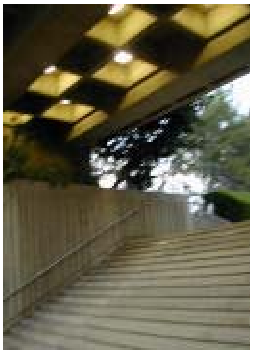


Figure 5.5 – Strategically located ceiling mount fixtures provide high level of illumination.

Figure 5.6 – Steplights with cut-off optics provide some protection against vandalism.

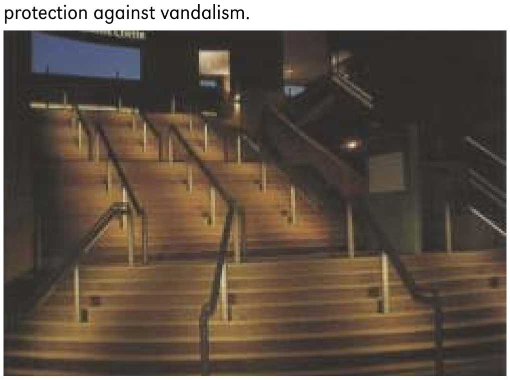


Figure 5.7 – Handrail integrated lighting can provide high levels of glare-free illumination.

Figure 5.8 – Vandal resistant bollard (Kim VSB)

Stairway Illumination (cont'd)

Recommendations

The following methods are recommended for illumination of stairways:

- building mount downlighting partially concealed by integration in coffered ceiling (While the use of one or two high brightness fixtures could become a source of glare, the use of many low brightness fixtures should not. Proper integration as well insures limited visibility of the fixture itself.)

- vandal resistant steplights using cut-off optics and/or protective grills (These should be located so as not to provide a glary view into the fixture interior to pedestrians ascending stairs.)

- handrail-integrated fluorescent lighting (This provides high light levels with little glare.)

- vandal resistant bollards (Optics should be provided/oriented so as not to shine light in the eyes of pedestrians ascending stairs.)

- building mount wall packs with cut-off optics (Optics should be provided/oriented so as not to shine light in the eyes of pedestrians ascending stairs.)

- post top fixtures mounted at the foot of stairs (located so as not to provide a view into the fixture interior to pedestrians ascending stairs)

- tree or building mount floodlights with louvers, baffles, or other glare control options (These should be located high enough so as to aim almost straight down and out of view of pedestrians, not becoming a source of glare.)

06 BUILDING ENTRIES

Figure 6.1 – Ceiling mount fixtures with diffuse lenses can provide high light levels with low surface brightness.

Figure 6.2 – Cut-off wall pack fixtures provide area lighting but also illuminate wall below to highlight entry.

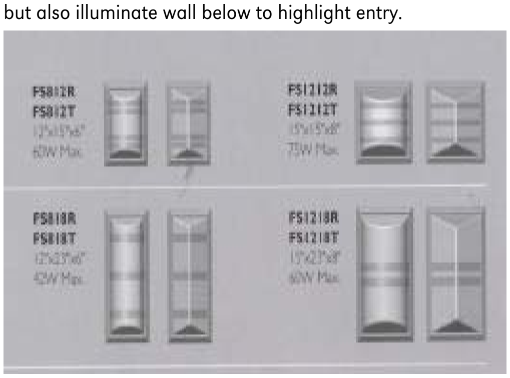


Figure 6.3 – Vandal resistant decorative sconces can come in various shapes and sizes. (Kenall Millenium FreeScale)

Figure 6.4 – Uplighting can be used to indirectly illuminate entries if layout doesn't cause light pollution.

Building Entry Illumination

Current Conditions

IESNA recommends a 5.0 foot-candle minimum at all building entries. Current campus lighting does not meet this in most instances.

- In some locations no additional lighting is provided at building entries.
- In other areas the lighting provided does not reach 5.0 foot-candles.

Recommendations

It is recommended in all locations that low-glare fixtures be provided that can:

- achieve the IESNA recommended 5.0fc minimum
- illuminate adjacent walls and surfaces for improved visibility
- be used as emergency lighting (This would prohibit the use of metal halide unless the College has an inverter system.)

Fixtures that can achieve this are:

- Downlights (surface mount or recessed)
- Ceiling mount vandal resistant fixtures (Polycarbonate lenses are discouraged.)
- Cut-off wall packs
- Low brightness, vandal resistant decorative sconces (Polycarbonate is discouraged.)
- Indirect light fixtures (where there is a white ceiling off of which to bounce light)

07 BUILDING PERIMETERS


Figure 7.1 – Non-vandal resistant fixtures should not be used where they are in easy reach.


Figure 7.2 – Highly visible glary fixtures are not recommended because they actually reduce visibility.

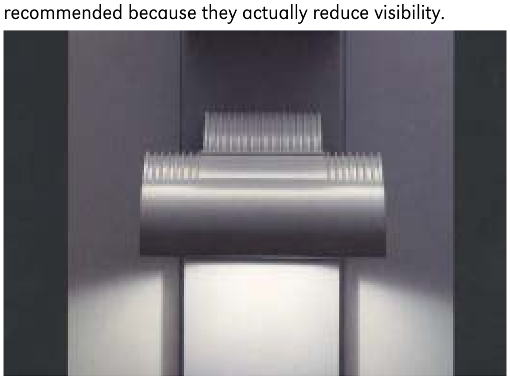


Figure 7.3 – The use of cut-off wall packs is a LEED criteria and required for new construction under 2005 Title24.

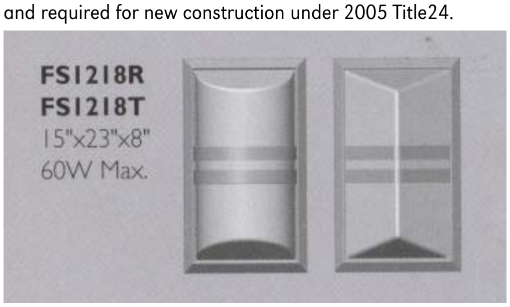


Figure 7.4 – Vandal resistant fixtures can be provided that still aesthetically integrate with building architecture.

Building Perimeters

Existing Conditions

The current pathway lighting around buildings tends to meet IESNA recommendations of 0.5 fc average and 4:1 max:min ratio.

At its best it incorporates concealed light fixtures that illuminate building architecture. At its worst it provides glary or non-vandal resistant fixtures within easy reach of pedestrians.

Recommendations

It is recommended that:

- Non-vandal resistant fixtures be replaced
    - with vandal resistant fixtures, or
    - with fixtures out of easy reach
- Non-cut off fixtures be replaced with full cut-off fixtures to assist in LEED accreditation. Any area lighting fixtures on new buildings will have to incorporate cut-off optics in order to comply with Title24 2005.
- Fluorescent, induction lamp, and/or ceramic metal halide sources be used for their superior color rendering.

07 BUILDING PERIMETERS

Figure 7.5 – Lighting integrated into coffers not only illuminates ceiling and building facades, but pathways.

Figure 7.6 – Architecturally integrated lighting can illuminate façade and provide area lighting for building

Figure 7.7 – Fluorescent billboard type fixtures can illuminate architecture as well as provide area lighting near

Figure 7.8 – Metal halide cut-off fixtures can illuminate architecture as well as provide area lighting near buildings.

Building Perimeters (cont'd)

Recommendations (cont'd)

- fixtures be located so as to illuminate architecture (covered in later section) as well as pathways. (Many fixtures currently achieve this but have been located irregularly in relation to the architecture, falling short of the strikingly beautiful effect that could have been achieved.) Examples are:
    - centering ceiling mount fixtures in building coffers (Where ceiling mount fixtures are tucked into coffers around the Library, they have only been located in some and not in a regular pattern. If fixtures would have been provided in every coffer (perhaps at a lower intensity,) not only would the ceiling have been fully illuminated, the building façade would have been evenly illuminated.)
    - integrating downlights at building eaves (For instance, at the College Center this would not only illuminate what is now a dark building façade but would provide lighting for the area around the building.)
    - locating fluorescent billboard lights at the top of tall walls (illuminating both the wall and the area below, which would be a stairway in the case of the east end of Student Services A.)
    - positioning cut-off wall packs high up on walls (or just below building ledges) in order to illuminate the façade below as well as the surrounding pathway and landscape

08 BUILDING FACADES


Figure 8.1 – Where beam distribution can be controlled so as to prevent directly illuminating sky, uplights are usable.


Figure 8.2 – Where uplights will not cause light pollution, they can be used to accent architecture.

Façade Lighting

Existing Conditions

Almost no lighting is currently provided specifically for illumination of architecture. What exists at the moment is:

- some uplighting at the stair tower at the Learning Resources Center (This would go against the light pollution guidelines for LEED certification.)

- coffer- integrated ceiling mount fixtures at the Learning Resources Center, Library, and Administration Building.

Façade lighting not only serves to create a more inviting nocturnal environment for students and accentuate the architecture, but it adds an element of safety, as it provides a bright backdrop against which any person or creature in the foreground will be visible.

Recommendations

Please see the previous section on Building Perimeters for suggestions that will both facilitate façade and area lighting.

In order to minimize light pollution façade lighting should be done mainly from illuminators mounted high and aiming down, but exceptions would be:

- spot lights that can direct all light on a horizontal surface (for instance, a clock high on a tower)

- uplights that are located under building ledges or canopies and so could not be expected to throw light directly into the sky

Where light fixtures are used solely to illuminate architecture, there is no necessity to use high color rendering white sources (like fluorescent or ceramic metal halide.) The use of high pressure sodium, colored lamps, or color filters may be appropriate depending on the particular circumstances.

09 PERIMETER LANDSCAPE

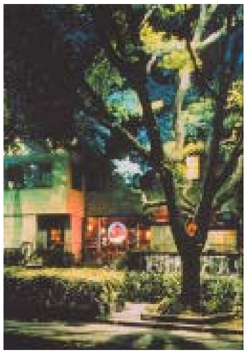


Figure 9.1 – Where fixtures are mounted high in mature trees, landscape and pathway lighting can be achieved.

Figure 9.2 – Post top fixtures can be used to illuminate adjacent landscape areas as well as pathways.

Landscape Lighting

Existing Conditions

With the exception of several non-functioning bullet lights at Learning Resources A, no lighting is currently provided for the illumination of landscaping.

Recommendations

Because of this we have many dark areas a short distance from pathways, parking lots, etc. As suggested previously, these areas should be taken in to consideration when planning area lighting for pathways, parking lots, and streets.

Apart from creating a more inviting nocturnal environment for students and highlighting trees, landscape lighting also adds an element of safety, as it provides a bright backdrop against which any person or creature in the foreground will be visible. For that reason the use of tree mount downlighting has been suggested (see section on Pedestrian Pathways.)

Lamp life should be taken into consideration when using tree mount fixtures, as access by motorized lift will be required. If appropriate induction lamp or LED fixtures are available when design is undertaken, those would be encouraged.

The use of landscape uplighting is discouraged because of LEED criteria regarding lighting pollution. As well, these fixtures are susceptible to vandalism, whether accidental or intentional.

10 SIGNAGE

Figure 10.1 – Existing building signage is internally illuminated, although unevenly.

Figure 10.2 – Where sign lighting is uplighted, barn doors, louvers, and other accessories can minimize light pollution.

Figure 10.3 – Low profile fluorescent sign lighters can be used to downlight monument signage. (AAL Pivot)

Figure 10.4 – Low profile fluorescent sign lighters can be used to downlight monument signage. (Cole SL)

Signage Illumination

Existing Conditions

Currently building designation signage is internally illuminated (although poorly,) and some (but not all) monument signs are illuminated.

Recommendations

The internally illuminated signage might be examined by a signage consultant with an eye to providing even internal illumination (although this signage seems to violate the letter of LEED guidelines, it might be argued that it does not violate the intent.)

All monument signage should be provided with some sort of floodlighting.

- If uplighting is to be used, it should be designed in such a manner as to minimize direct illumination to the night sky.
- Some form of downlighting is encouraged. Low profile fluorescent sign lights are available that will be minimally obtrusive.

Where street or other informational signage is located:

- this can be coordinated with the layout of parking or pedestrian light fixtures so as to receive illumination from them
- should be provided with reflectorized lettering and graphics for high legibility when viewed from a motor vehicle

11 SPORTS FIELD

Figure 11.1 – Existing lighting consists of gas-powered construction floodlights.


Figure 11.2 – Sports lighting fixtures can be arrayed on poles on both sides of the field to provide even illumination.


Figure 11.3 – Fixtures are recommended that use internal as well as external glare control.

Sports Lighting

Existing Conditions

Currently temporary gas-powered road construction type floodlighting is employed at the track/practice field located north of the tennis courts. This is unacceptable to to:

- glare
- very harsh shadowing
- inadequate illumination
- likelihood of power failure (running out of gas)

Recommendations

If this area is to be used during evening hours, a proper sports lighting system is recommended.

- This would employ arrays of sports lighting spot lights mounted on multiple poles running along both the north and the south lengths of the field.
- Poles would be quite tall in order to provide appropriate aiming angles and minimum glare.
- Fixtures could be accessed via lift, or a permanent ladder and catwalk could be provided.
- Fixtures with high glare control (including internal visors) are encouraged to minimize visibility from off site.

12 EMERGENCY LIGHTING

Emergency Lighting

Typically, code requires that emergency lighting be provided within buildings, in some cases creating an illuminated path all the way out from a building to the adjacent roadway.

However, as this site is in a secluded area apart from the nearby residential and commercial areas, it is encouraged that some site lighting (including pedestrian pathways and parking lots) be included on an emergency back-up system.

Currently, the solar powered cobra head fixtures that still function fulfill this requirement. If those should be deleted, this suggested emergency back-up system might be implemented.

13 SOLAR POWER

Figure 13.1 – Solar panels can be concealed atop roof tops and aimed for optimal energy collection.

Figure 13.2 – Solar panels can be integrated into building facades, hidden in plain view.

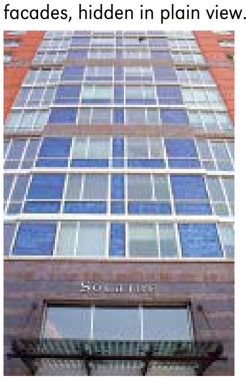


Figure 13.3 – Solar panels can be integrated into building facades, hidden in plain view.

Figure 13.4 – Solar panels can serve double purpose as sun screens for building interiors.

Solar Powered Lighting Fixtures

Existing Conditions

Currently, there are a couple dozen solar powered “cobra head” style light fixtures located on building facades and in parking lots about the campus. Some of these function, and some do not.

Problems associated with this type of fixture include:

- Fixtures run out of power prior to sunrise.
- Fixtures use low intensity lamps, as they cannot store the power to run high output lamps for an extended period of time.

An additional problem with the existing fixtures on site is that they use a dropped lens and so violate LEED guidelines regarding light pollution.

Recommendations

The use of solar power is greatly encouraged. However, individually powered fixtures are not recommended because of their current unreliability.

Existing buildings currently have a great amount of roof space. Perhaps some of this can be dedicated for the placement of solar panels, which will be much more effective and useful. As well, future buildings could be designed with solar panels incorporated into building facades or other architectural elements.

14 LIGHTING CONTROLS

Figure 14.1 – Control systems can control groups of fixtures independently and in relation to daylight and/or time.

Site Lighting Controls

Existing Conditions

At the present time different fixtures about the site

- seem to be controlled independently
- turn on in some cases far before sunset

Recommendations

A campus-wide exterior lighting control system should be provided that incorporates an astronomical time clock and/or photosensors. It may be appropriate that different fixtures come on at different times (for instance, the lights under a building canopy before the parking lot lights,) but they should turn on in relation to the amount of sunlight available.

Astronomical time clocks allow the on- and off-switching of the lights to be set in relation to sunset and sunrise. The clock compensates for the time of year so that lights can come on at 5PM in the dead of winter and 8:30PM in the middle of summer.

G | PARKING & CIRCULATION

As part of the first phase of the Crafton Hills Community College Master Planning, this assessment summarizes the analysis of the existing parking and circulation systems as they exist today. Through parking utilization surveys, campus tours and interviews with campus personnel, both current deficiencies and opportunities for improvements at the campus were identified.

PROJECT SITE DESCRIPTION

The college is located in the City of Yucaipa, served mainly by the Interstate Highway 10 (I-10). Major arterials in the vicinity serving the campus are Yucaipa Boulevard, Sand Canyon Road, Sixteenth Street, and Oak Glen Road/Live Oak Canyon Road.

Located on a bluff north of Yucaipa Boulevard, there are only two accesses to the campus, the east access through Yucaipa Boulevard to Campus Drive or west access through Sand Canyon Road to Campus Drive. Campus Drive wraps around the campus on the east side and to the north and then connects with Sand Canyon Road to the west. The campus is bounded by Sand Canyon Road to the south. Figure 1 illustrates the configuration and the location of the campus.

Crafton Hills College opened in September of 1972. In the fall of 2004, the campus had approximately 5,700 students enrolled with approximately 309 faculty and staff. Combined, the number of students, staff and faculty translates to approximately 2,044 Full Time Equivalents (FTE). Table 1 summarizes the breakdown of the college's current enrollment by headcount and FTE.

Students, staff, faculty and visitors are served by parking Lots A through I, located on the north side of the campus. There are an additional seven surface parking lots designated to serve different parts of the campus. All the surface parking lots can be accessed using Campus Drive. Along Campus Drive, there is on-street parking available with the exception of the areas at roadway curvature and curb cuts. On-street parking on Campus Drive does not have any time limitations and/or restrictions.

EXISTING CONDITIONS AND CURRENT DEFICIENCIES

Parking and Circulation System Issues

Lots A through I currently provide a total of 953 parking spaces. The temporary (gravel) lot, Police Station Lot, Custodial Lot, Occupational ED 1 and 2 (OE 1 & 2), College Center Lot (CC), Performance Art Center Lot (PAC), and the Child Development Lot (CDC) provide a total of 265 spaces. Assuming a 20-foot car length, there are approximately 379 parking spaces along Campus Drive East, Campus Drive North, and along the segment of street leading up to CDC for a total supply of 1,597 spaces. Figure 2 illustrates the location of the parking supply.

An hourly parking occupancy survey was conducted on Tuesday, March 22 between the hours of 8 a.m. and 7 p.m. Tuesday, March 22 is the first Tuesday of the spring 2005 term. According to school officials, Tuesday is the peak day of the week.

Occupancy survey showed that during the peak day of the week, the entire campus is adequately served. With an overall supply of 1,597 spaces, peak utilization occurred between 10 and 11 a.m. with 1,019 spaces occupied or approximately 64% occupancy. Figure 3 summarizes the utilization survey for the entire campus.

Lots A Through F

Lots with specific designation such as the Police Station Lot, Custodial Lot do not serve students, faculty or staff. To get a better sense of how the campus is served from a purely academic standpoint, survey results for Lots A through I were isolated. With a total supply of 953 spaces, there were 900 spaces occupied (94% occupancy) in Lots A through I during the peak hour (between 10 and 11am). Figure 4 summarizes the utilization for Lots A through I.

Eight out of the nine lots (Lots A through I) reached an occupancy rate at or exceeding 90% between the hours of 9 a.m. and 3 p.m. Lots A and B exceeded 100% occupancy, indicating vehicles illegally parked at red curbs or double-parked. Table 2 summarizes the survey for Lots A through I.

Lots A through F and I experience peak utilization during the daytime and Lots G and H experience peak utilization both during the day and evening hours. According to Vice President Laurens Thurman, the athletic fields across from Lots G and H are leased to the community and are utilized during the evening hours. The peak utilization during the evening at Lots G and H may be attributed to community usage of the athletic fields. Occupancy in Lot D appears to be low due to short-term parking. With the exception of one hour, Lot I is generally underutilized between the hours of 8 a.m. and 7p.m. The underutilization of Lot I may be due to its distance from the campus.

Designated Off-street Lots

The utilization survey for the remaining off-street lots showed that peak utilization occurred between the hours of 11 a.m. and 12 p.m. With a total supply of 265 spaces, only 40 spaces were occupied during the peak hour (15% occupancy). Figure 5 illustrates the survey results for the remaining off-street lots.

A detailed look at each of the seven designated lots showed the available spaces for students, faculty and staff are underutilized. Occupational ED 1 & 2 are completely unused, as is the temporary (gravel) lot. Table 3 summarizes the survey for each of the designated lots.

On-street Parking

Figure 6 illustrates the areas of on-street parking covered in the utilization survey. There were 16 segments of Campus Drive surveyed. Table 4 lists all 16 segments and the utilization survey results for each segment. Figure 7 illustrates the on-street parking utilization results as a whole. Consistent with the off-street survey results, on-street parking utilization also experiences peak usage between 10 and 11 a.m. With an estimated total of 379 available spaces, 79 spaces (21%) were utilized during the peak hour.

Combined, on-street segments 1 and 2 contain approximately 200 spaces. The survey showed that these two segments are completely unused mainly due to their distance from campus. Currently there is no pedestrian connection between Campus Drive East and the campus buildings. When parked on segments 1 or 2, one would be required to walk up the slopes of Campus Drive East without a proper sidewalk to get to the campus. Aside from the lack of pedestrian access, segments 1 and 2 are located even further than Lot I, making the area of the on-street parking supply the least desirable choice for parking.

The remainder of the segments of surveyed on-street parking along Campus Drive also experience the same inadequacies as segments 1 and 2. With a lack of pedestrian access provided, the on-street parking supply is not appealing and will continue to be underutilized.

Pedestrian Access

Users of Lots A through I are accommodated by the sidewalk fronting the campus buildings, located between the buildings and the lots. Entryway onto the sidewalk is limited due to the grade difference between the elevation of the campus buildings and the lots. In particular, because of the grade differences, handicapped ramps cannot be provided for Lots A, B and C. Within the lots, there appeared to be no designated pedestrian walkway to channel foot traffic, creating vehicular and pedestrian conflicts during the campus peak hour.

Pedestrian access in other designated parking lots is similar to the operations of Lots A through I.

There is no pedestrian access for on-street parking. There are no sidewalks provided along Campus Drive. Immediately adjacent to the roadway curb is landscaping. Users of the on-street parking spaces need to walk on Campus Drive into one of the surface parking lots to get to campus, creating more pedestrian and vehicular traffic, not just at the surface parking lots but also along Campus Drive.

Existing Transit Services

The Omnitrans serves all of San Bernardino County (SBC). The SBC transit service currently has two routes into Crafton Hills College: Line 8 and Line 9. Line 8 is the San Bernardino-Mentone-Yucaipa route and Line 9 is the San Bernardino-Redlands-Yucaipa route. Both routes run along Yucaipa Boulevard, stopping on Campus at the turnaround south of parking Lot D to Sand Canyon Road. Figure 8 illustrates the bus routes.

Beginning at 6 a.m., Lines 8 and 9 run at approximately one-hour intervals. Line 8 stops its services to the campus at 5 p.m. and Line 9 stops serving the campus at 7 p.m. According to Vice President Thurman, Omnitrans does not intend to expand services and/or extend the current transit services to campus.

Service and Emergency Access

Crafton Hills College has a maintenance yard and a designated area for incoming deliveries. This designated area is up in the hills, north of the campus, west of the athletic fields. The only access to the receiving area is through the road adjacent to Lot A. According to Vice President Thurman, the receiving yard mostly gets deliveries from cargo vans, however, on occasion, semi trucks traverse the small access road through winding curves to make deliveries.

With the receiving and maintenance yard tucked away in an area away from campus activities, the campus traffic is separated to minimize vehicular conflicts. As the campus grows, however, the small access road, the only access the receiving yard, would present a problem as deliveries are expected to be made more frequently by semi trucks. Without adequate turning radii for trucks, Campus Drive East may be blocked, preventing other traffic, including emergency vehicles, from accessing the campus.

Emergency access to campus buildings appears to be well signed and striped. Within the campus grounds, emergency access for the fire department and the police department appears to be adequate, but emergency access to the campus from the external street network appears to be constrained.

Located on a bluff, Crafton Hills College is relatively distant from the nearby street network. Having only two accesses to the campus, school officials discussed the consequences of one of the access becoming inaccessible during emergency situations like the San Bernardino brush fires that occurred this past winter.

FUTURE OPPORTUNTIES

Parking Management

Overall, the campus is adequately served from a parking standpoint. Utilization surveys showed only 64% of the entire parking supply is used during the peak hour on a peak day of the week. While the current parking supply of approximately 1,600 spaces seem to be the serving the campus adequately, school officials have said students often complain of the lack of available parking. School officials have said that during the peak hour, students are circulating Lots A through I looking for available parking while lots like the CDC, PAC, and OE 1 & OE 2 are empty.

The survey shows nearly 40% of the supply is unused (265+379/1,597). The primary reason for the underutilization of 40% of the available parking is due to distance from campus. Other reasons are the less apparent locations of the designated lots or the lack of available pedestrian access.

There are a number of measures that can be easily implemented to use the empty parking lots better. For example, Vice President Thurman indicated that the CDC is a much better access for students from a pedestrian standpoint because the lot is at grade with the campus buildings whereas Lots A through I are located at a grade lower than the campus building, requiring the need to take the stairs to get to campus. Even so, not too many students on campus know the existence of the CDC lot. Thus, with enhanced signage on Campus Drive on both ends of the road to advertise the availability of the other lots, students and visitors would be more likely to utilize areas other than Lots A through I. As a secondary effect, the advertisement of the other lots can also lead to channeling the right people to the right places better.

Parking Garages

In the future, as the campus grows, the parking management measures mentioned above may not be appropriate to meet demand requiring the need to provide more supply.

The March 2005 survey shows that currently, the campus parking demand is at 0.5 spaces per FTE (1,019 peak usage / 2,044 FTE in 2004). With a supply of 1,597 (using 90% utilization as full capacity), the campus can add another 830 FTEs before the current supply becomes inadequate:

1,597 current supply * 90% full capacity threshold = 1,437 current supply
1,437 spaces/0.50 space per FTE = 2,874 FTE
2,874 - 2,044 current FTE = 830 additional FTEs

School officials have discussed building a new parking garage to meet future needs. There are a few locations on campus that are suitable for the said parking facility. Based on site surveys, the locations of Lots A, B and C would be ideal. Currently, because of their elevations, these lots cannot provide handicapped access. Given their elevations, the parking garage can be built from the ground up,matching one of the garage floors to the grade of the campus buildings to serve the disabled. As shown in the utilization surveys, parking supply located farther away from the campus core become underutilized. Lots A, B and C are in an ideal location as they are close to most of the main functional buildings on campus.

Another possible location for a parking garage would be at the existing gravel lot located at the entry way on the west side of the school. The area of the gravel lot is not as big as the areas of Lots A, B and C combined, requiring more grading in the surrounding areas. As in Lots A, B and C, the gravel lot is located at a lower grade than the campus buildings and is ideal for a structure. Because it is not located close enough to the campus, a parking garage at this site would not allow direct access to the campus buildings.

Pedestrian Access

The lack of sidewalks reduces the attractiveness of the on-street parking supply. Further, the lack of sidewalks creates pedestrian and vehicular conflicts as pedestrians are forced to walk on the streets without separation from vehicular traffic. It is recommended that a 10-foot sidewalk be constructed all along Campus Drive, beginning at the intersection of Sand Canyon Road and Campus Drive to the southeast, extending all the way to the intersection of Campus Road and Sand Canyon Road to the northwest. It is expected, as pedestrians enter the core area of the parking supply (Lots A through I), that they would be using the access roads from the lots to the campus. The proposed sidewalk is only needed at the north side of Campus Drive, the segment of Campus Drive from Lot I to the east to Lot A to the west.

To make better use of the available parking along Campus Drive the segment from the intersection of Sand Canyon Road and Campus Drive to the southeast, it is proposed that cut-through pedestrian walkways be constructed across the bluff from Campus Drive to the OE 1 and OE 2 buildings. This direct access from the east side of the Campus Drive would negate the need for users of the on-street parking supply to walk up the hills of Campus Drive, looping around Lot I to get to campus.

Expanded Transit Services

According to Vice President Thurman, the San Bernardino County Omnitrans bus service does not anticipate an expansion of services or addition of routes to Crafton Hills College.

Vice President Thurman discussed the benefits of having the current bus routes extended into the evening hours beyond 7 p.m. Utilization in the evening showed that four of the A through I lots experience occupancy above 70% at 7 p.m., indicating a large number of evening students that could benefit from the extension of current transit services. Likewise, during the campus' morning peak hour, added routes and or addition of services (more frequent intervals) to the existing Lines 8 and 9 could draw more ridership.

A variety of campuses have approached transit operators to expand or add services to schools by supporting/funding the construction of an on-campus transit hub that facilitates the ingress/egress of buses to and from the campus. Coordination with Omnitrans is an opportunity to reduce future parking demand by providing more transit services.

Service and Emergency Access Improvements

Ingress and egress to the campus site is minimal with two access points. Blockage to one of the access could prevent the vehicular operations in and out of campus and create a dangerous situation during an emergency scenario, as school officials have said. In order to minimize potential blockage to any of the accesses, the service road to the receiving and maintenance yard on the north side of Campus Drive (north of Lot A) should be improved to accommodate semi trucks. The service road should be widened and a truck turning movement analysis of the service road and Campus Drive should be conducted.

Minimizing the potential for blockage to the existing two access points would not serve the campus adequately during emergency situations. Both the east and west access roads loop around the bluff to get to the campus. The distance from the external street (Yucaipa Boulevard and Sand Canyon Road) network system to the nearest campus building is not conducive to response time during emergency situations. Sharing the same concerns as the school officials, it is suggested that additional access be constructed that would shorten the distance from the external street network system to the core of the campus.

An ideal third access would be along Sand Canyon Road west of Campus Drive East to the south of the school. The proposed access would be constructed to intersect Sand Canyon Road through the area called the Peninsula to reach the campus buildings to the north. This proposal would allow a faster connection from external roadways to the campus.

As a part of the same effort to reduce emergency response times, an additional alternate access surrounding the campus would benefit campus vehicular operations. From a traffic standpoint, campus growth indicates greater capacities at the entry points to the school. In the future, not only will two access points be detrimental to the campus emergency response times, but the two accesses may not be adequate to accommodate the anticipated growth.

For example, all parking lots currently unload directly to the north segment of Campus Drive. Lot I as well as the lots in OE 1 and OE 2 can be loaded directly to Campus Drive East. Similarly, the CDC lot can be unloaded directly onto Sand Canyon Road to the west. Located on a bluff, it is difficult to negotiate the grade differences between the levels of the lots and roadways. The benefits of added access, however, warrants additional discussion on this topic.

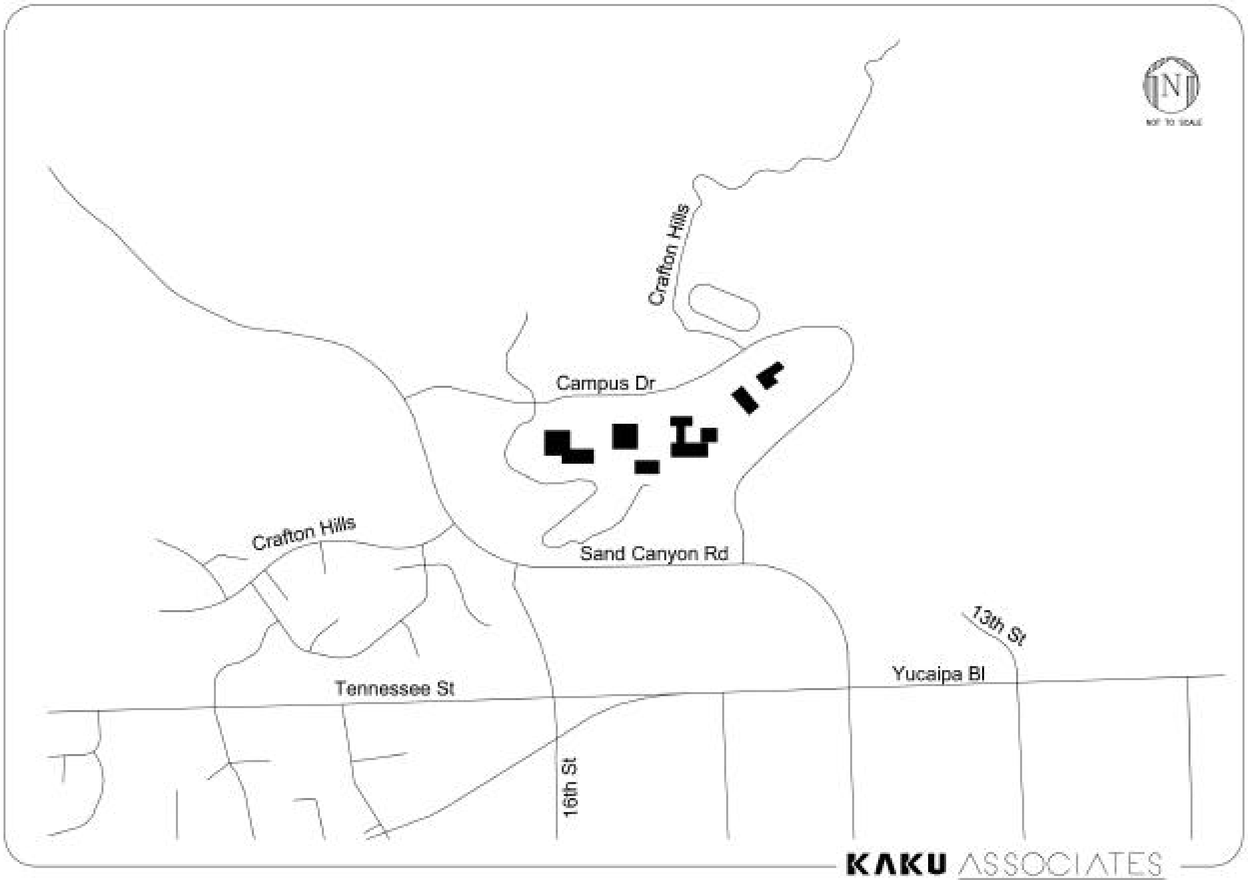
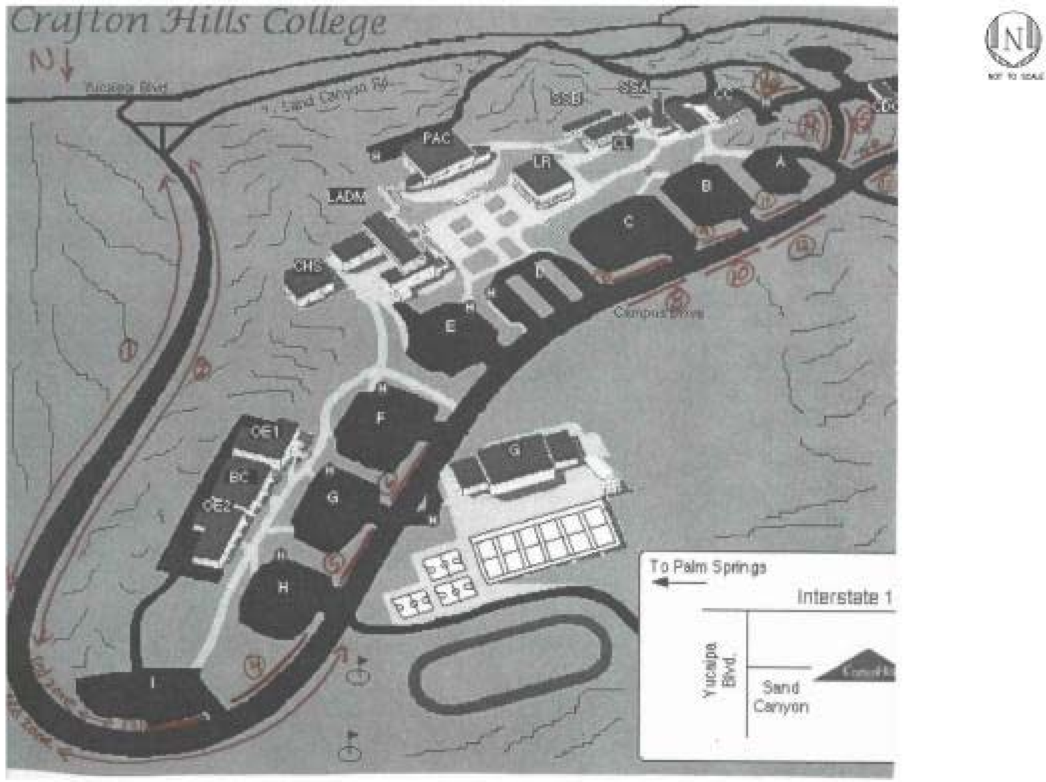


FIGURE 1
PROJECT SITE



KAKU ASSOCIATES

FIGURE 2
LOCATION OF PARKING UTILIZATION SURVEY

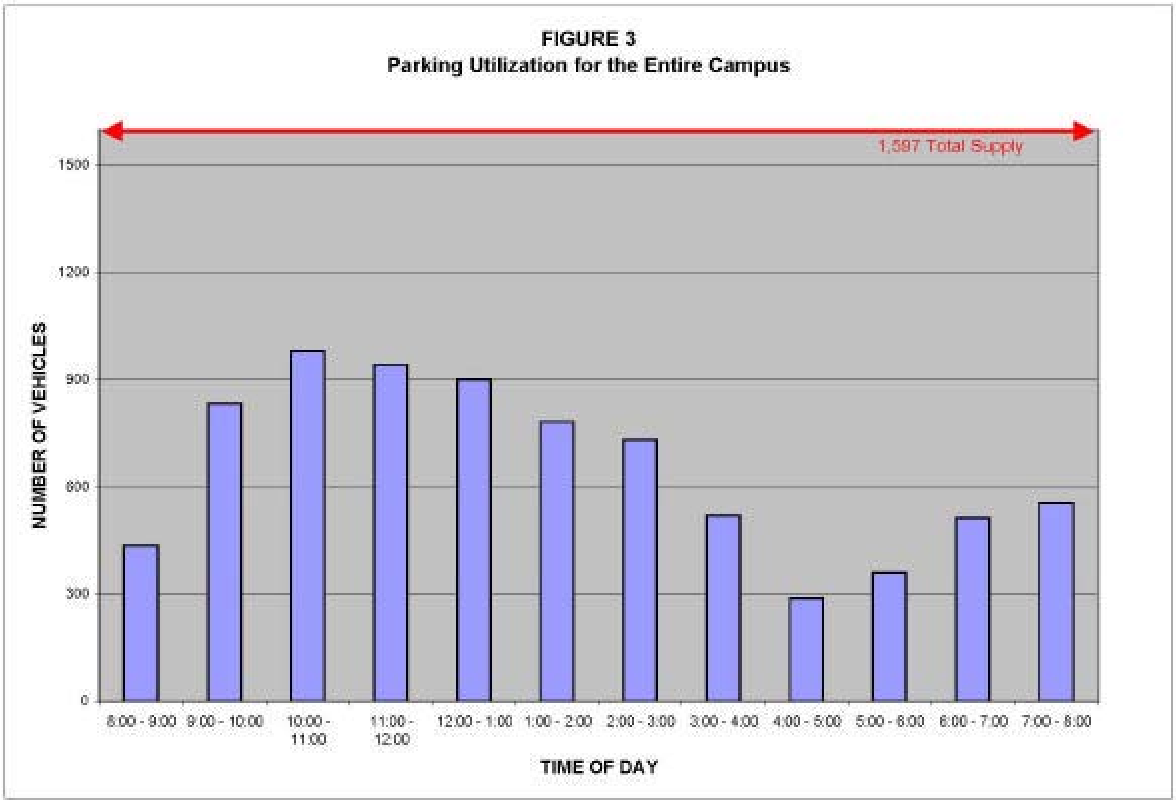


FIGURE 3
Parking Utilization for the Entire Campus

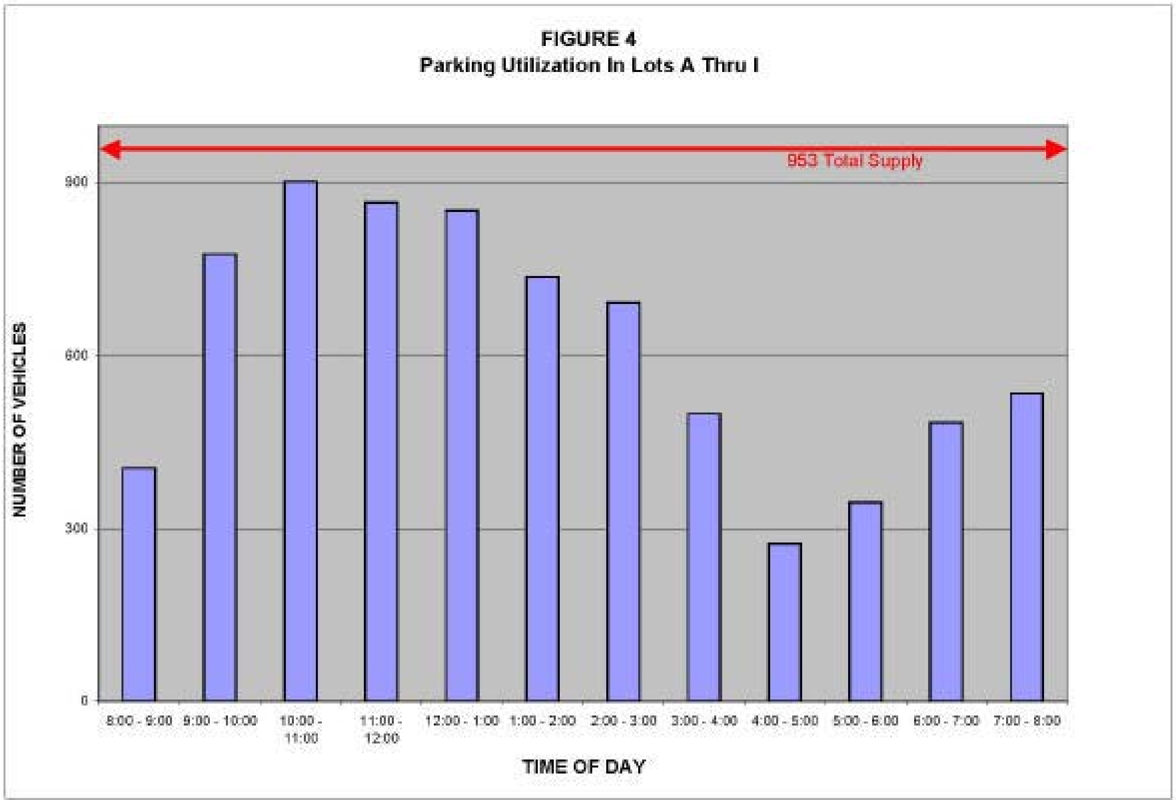


FIGURE 4
Parking Utilization In Lots A Thru I
953 Total Supply
NUMBER OF VEHICLES
900
600
300
0
8:00 - 9:00
9:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 1:00
1:00 - 2:00
2:00 - 3:00
3:00 - 4:00
4:00 - 5:00
5:00 - 6:00
6:00 - 7:00
7:00 - 8:00
TIME OF DAY

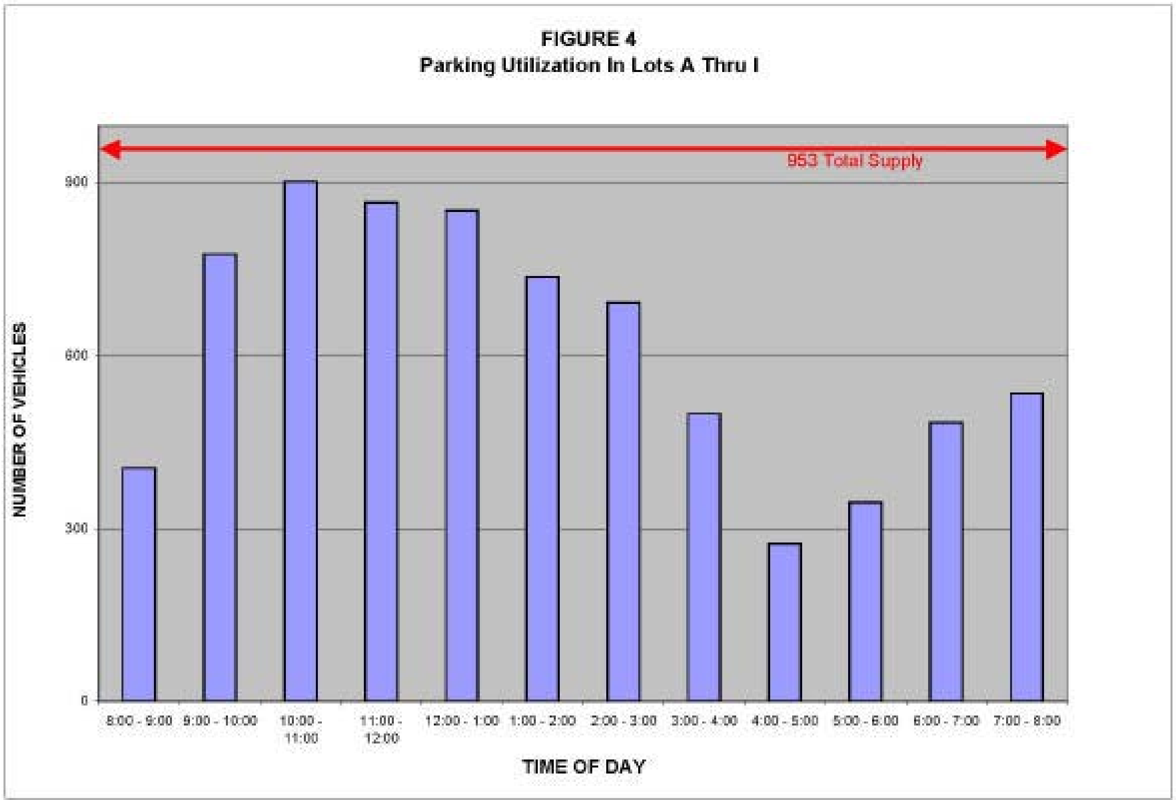
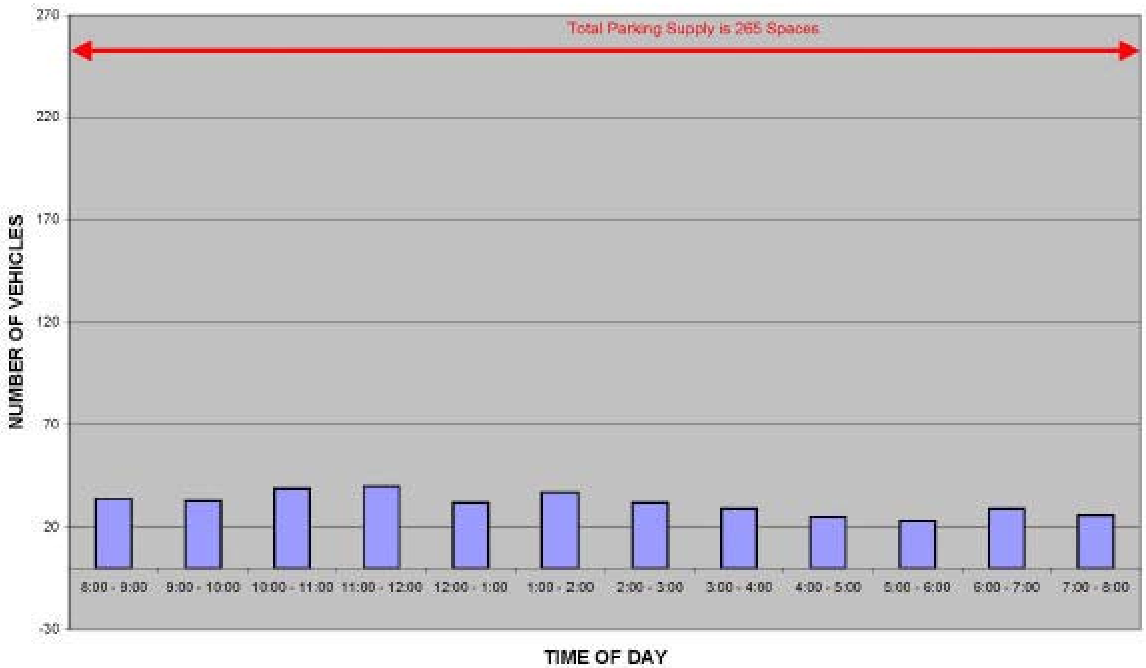


FIGURE 4
Parking Utilization In Lots A Thru I
953 Total Supply
NUMBER OF VEHICLES
0
300
600
900
8:00 - 9:00
9:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 1:00
1:00 - 2:00
2:00 - 3:00
3:00 - 4:00
4:00 - 5:00
5:00 - 6:00
6:00 - 7:00
7:00 - 8:00
TIME OF DAY

FIGURE 5
Parking Utilization In Designated Lots



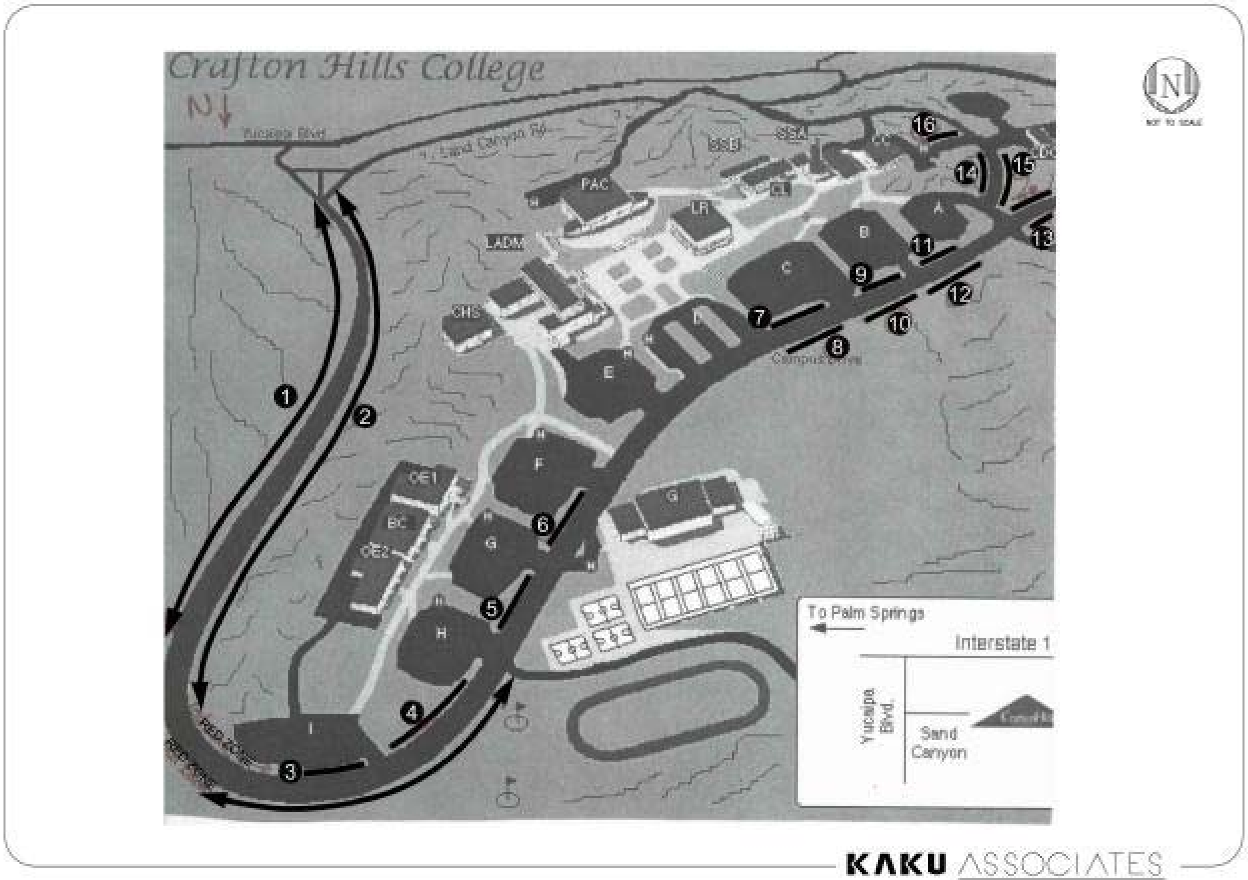
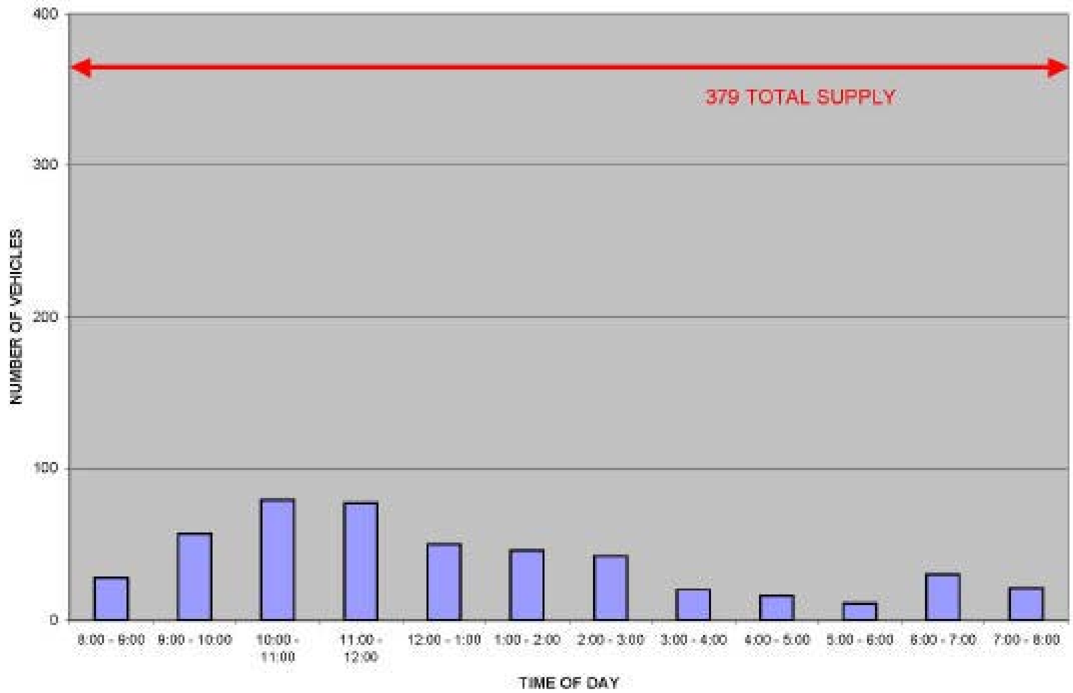


FIGURE 6
SEGMENTS OF ON-STREET PARKING SURVEY

FIGURE 7

Parking Utilization for On-Street Supply



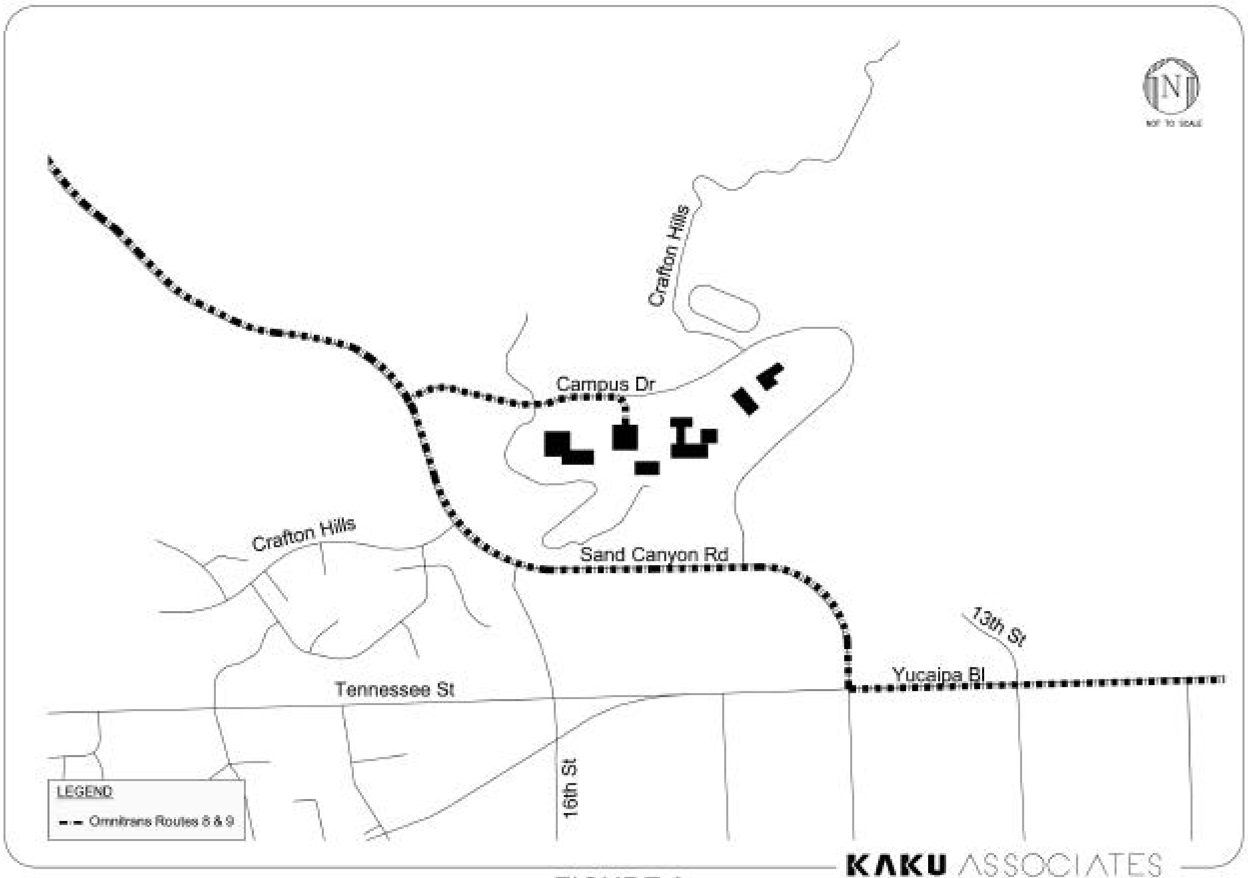


FIGURE 8
OMNITRANS SERVICES
BUS ROUTES TO CAMPUS

TABLE 1
CRAFTON HILLS COLLEGE MASTER PLAN
ENROLLMENT FOR ACADEMIC YEAR 2004

Category	Head Count [a]	FTE [b]
Students	5692	1811
Faculty	189	119*
Staff	120	114*
Total	6,001	2,044

[a] Source: Crafton Hills College Vice President Laurens K. Thurman
[b] Full Time Equivalent (FTE)

* 2003 data (latest available)

H | SECURITY

Introduction

The following report of security-oriented observations is made with the awareness that certain Campus upgrade projects and operational changes are either underway or in the planning stages, and certain surrounding community projects are in various stages of implementation. These are:

- The Siemens Physical Plant Upgrade Project, which includes some security and lighting enhancements.
- Contemplation of unifying the campus police forces, with the potential of the "head end", (communications or dispatch), being located at the Valley College campus.
- Based on two studies, potential of the campus population doubling within a few years.
- The introduction of a major residential housing development, just to the West of the Campus. This development may finalize at 3,500 + homes, plus the addition of homes and a new road, in the tract to the South.
- The possible introduction of a swimming pool to the campus, with involvement of local government agencies.
- The possibility of the introduction of a parking structure in the vicinity of the present "A" Lot parking area.

When appropriate, references to these project/s or potentials shall be made within the report, within the context of observations on existing security conditions.

It is also a presumption of this report section that the Campus has since its inception experienced a sense of isolation or "out of sight, out of mind", relating to much of the typical weekend and after hours crime and vandalism that plagues some community college campuses in the southern California region. With the projected growth, both in enrollment and the surroundings, this condition will surely change to one more in line with the "norm". At the same time, it is presumed that no one considers "security" to be the primary undertaking of the college. The thrust of this report is to highlight current conditions and practices that, if altered, implemented, or corrected, could enhance the existing security/police procedures or applications.

This report presents findings based upon observations of the current practices and conditions relative to the Campus Police force, control of access to Campus facilities, and the safety and security of staff, students, and visitors to the Campus. In the assessment leading to these findings, observations were made of the specific access points to buildings relative to the contents within and areas where cash is present. Attention was also paid to areas or zones where the potential for harm to befall individuals, either through a hazardous condition or the actions of an individual or group, existed. Attenuation of the observed potentials was considered in several ways, including the application of an electro-mechanical solution or an enhancement, alteration, or introduction of a procedure that could assist in mitigating the condition.

The electro-mechanical systems considered were: Access Control with badging capability; Closed Circuit Television (CCTV), digital with recording and network transmission capabilities; alarms, both exterior and interior; and exterior lighting and signaling.

Observations were also made of the Police Department operations, including Communications. In cases where observations suggested changes to the current operations, these are also noted. For simplicity, this report is broken down into system or operational sectors, as many of the conditions noted have a more Campus-wide perspective. Thus, there are comments relative to Access Control, CCTV, alarms, lighting, Police operations, and earthquake/emergency preparedness. Specific physical locations or facilities concerns are addressed within the relevant system or operational section.

SECURITY – ACCESS CONTROL

Figure 1 – Proximity Card Reader, (wireless), without keypad. Only addressed with a radio frequency interface card.

Figure 2 – Proximity Card Reader, with Keypad. Can be programmed to actuate through use of either or both.

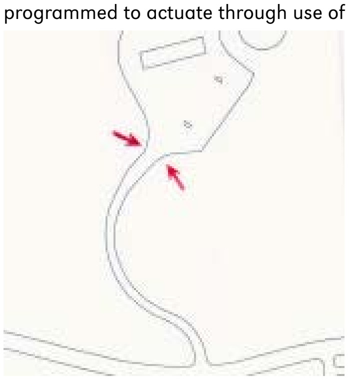


Figure 3

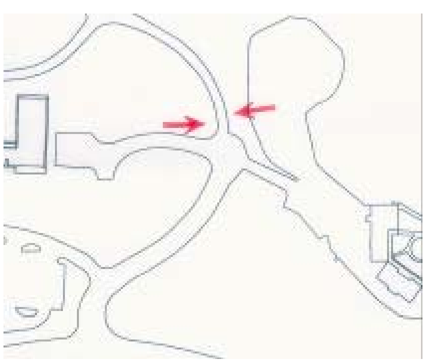


Figure 4

Current State:

- Two keyed systems are in use across the Campus: Sargent and Corbin-Russwin.
- Key control within these two applications is not reported as good, especially as relates to masters and sub-masters.
- Process underway of currently applying an initial, Software House, C-Cure 800, access control System to 36 specific doors
- Present application employs both proximity card readers and combination proximity card readers with numeric keypads, (see figures 1 and 2, on the left)…
  - Procedure of use of keypad portion of readers needs to be reviewed carefully. This type of application leads to system breaches, as there is no traceable "credential" in the hand of, keypad only, enabled users. Database maintenance will need to be effected on a constant and timely basis.
  - In the process of application of some of the electric strikes, used as the electro-mechanical locking device on some of the access controlled doors, the anti-pry plate has been removed and not reapplied, due apparently, to interference with the electric strike. With some of these doors it is appears possible to access the locking "bolts".
  - HVAC pressure differentials and door closer speeds and pressures need to be reviewed, campus wide, but especially for any doors involved with access control. At least one door has been noted as failing to secure with normal use, due to air pressure, (Communications, East door).
- Application of access control should be extended to all perimeter doors of the campus. Through such an application, door status can be assured without physical inspection, as currently required. This is one, in a group of, "force multipliers/levers" that, when applied, can avoid costly manpower additions.
- Consideration should be given to the application of card access controlled rolling or swinging gates to the maintenance/ Receiving/ Custodial Yard and the access road to the rear of the Performing Arts Center.
  - The "Maintenance Yard" gates are, once again, being left open between 1500 and 2300 hours, M-F, to facilitate custodial comings and goings, see figure 3.
  - The gates to the North access road are bent out of shape and currently un-securable. "Apparently locked" means are currently being employed through the use of a chain looped over the left upright; no locks involved, see figure 4.

SECURITY - ALARMS

Figure 1 – Four “cashier” windows in the Registration Office, from the outside.

Figure 2 –The same four windows from the inside…

Figure 3 –Lot “B” from opposite the SSA Building

Current State:

- Only one area uses alarms at the present time. This is the new Bookstore. There is a duress alarm for the cashier that reports to an offsite contract alarm company, who will call the SB Sheriff.
- There are several other locations on Campus, where cash exists, but none of them have alarms. Besides the main Business Office, in the Administration Building, there is the Student Cafeteria, the Office of Records and Registration in SSA, the Child Development Center, and Communications, where proceeds from parking are managed. (See further on cash, under Campus Police)
- At the Office of Records and Registration, there are four “cashier windows” which appear to be protected, from the outside. From the inside however, the cash stations are accessible as they are not walled in and the main door to the space is often left open.
    - The presence of the “cashier” windows is actually a negative from a security perspective, as it signals where the money is; it would be better if the stations inside were inaccessible, (see figures 1 and 2, to the left).
    - The balance of the Campus is directed to use the phone system for personal alarm needs. There are two problems with this approach, 1) if the need for an alarm is due to a personal confrontation, reaching for a phone might tend to worsen the situation; the use of a discreet duress button can often go unnoticed, and, 2) the phone method adds steps to the reporting process, and, given the limited response capability present on Campus, may delay the potential resolution. Consideration should be given to utilizing discreet duress alarms at all locations where cash is handled, in the counseling area, and in main administrative offices.
- There are currently no “panic” alarms or phones in the various parking lots. As several of these are remote from the Campus walkways and staff, both in distance and grade differential, the potential is high for situations to go unreported and/or responded to (see figure 3, to the left).
- Motion detection type alarms do not appear to be utilized anywhere on the campus. Consideration should be given to their use in some of the more remote areas of the campus, such as the CDC, the Maintenance/Receiving/Custodial Yard, the service road to the PAC, and in the Paramedic area where medications are stored. These alarms need to be direct to the Campus Police to allow rapid response.

SECURITY – CLOSED CIRCUIT TV

Figure 1 –Toward 03-Student Center / Cafeteria

Figure 2 –Westward, toward 02-Library.

Figure 3 – From South of 04-Student Services A toward Lot B.

Figure 4 –Westward, toward the 02-Library

Current Conditions

- The only Closed Circuit Television currently installed on the Campus is at the Child Development Center. This system is currently not operative. The system consists of four cameras, two in the front, one on the South side, and one in the rear watching the main play yard.
- The system is capable of operation; however, it is not currently hooked up at the campus data center in the Library.
- Neither of the cameras at the front of the building have the main driveway as a point of focus. Typically in abduction scenarios at childcare centers, it happens quickly and the child is taken from the site in a vehicle. In recovery of the child, the greatest assistance comes from a good vehicle description and license number. As currently configured, this system will not provide that information.
- Consideration should also be given to enhancing the system at the CDC in making selected images available to parents via the network.
- Part of the Siemens Project calls for eleven new cameras to be introduced. Of these, ten are slated to be interior cameras focused on specific points of interest; one will be a pan, tilt, and zoom exterior camera. It is with the exterior cameras that the greatest force multiplication could be realized. These allow “virtual patrols”, thus cutting down on the time required for physical presence by the Police. Consideration should be given to covering the more remote locations, such as the 09-Maintenance/Receiving/Custodial Yard and the North access road, 08-The Performing Arts Center, the rear of the 06 & 07 OE Buildings, and 17-Book Store.
- CCTV, at its best, is a proactive force multiplier. The more usual role is as a visual deterrence and a research tool. However, if the images are fed to the front line protective force, they can become a means of leveraging the available work force and their response capability. The technology exists today to allow this to happen. Alarms and CCTV images can be fed to the Officers, either in their vehicle, or even while afoot.
- The Campus does suffer from expansive landscaping that is a hindrance to exterior CCTV coverage. (See figures 1-4)

SECURITY-STREETS AND PARKING LOTS

Figure 1 –.

Figure 2 –.

Figure 3 –

Figure 4 –

Existing Conditions

- As mentioned in the introduction, parking is at a premium on the Campus, especially during the daytime, at the beginning of each registration period. The crowding creates some marked hazard areas, where conflicts between vehicles and pedestrians are potentially high. Of special concern should be the five crosswalks of the main street. These are delineated, on the surface only, with yellow paint. During evening and night hours, this is easily overlooked, or at anytime, when "previewing" the parking lots for a potential slot.
- Consideration should be given to adding lighting to these crosswalk areas. The least expensive solution might be with solar powered light bollards. These could be placed on switches that would allow them to be activated when pedestrians desire to cross. In any case, extra lighting or signage should be applied to these crosswalks and to convergence areas in the parking lots that lead to Campus access stairs or walkways. see figures 1-3 as examples of typical crosswalks.
- In general, traffic speeds on and near the Campus tend toward the high end. There is little or no use of speed bumps, and physical evidence in the form of skid marks exists to prove that the basic speed limit of 25 mph is exceeded on many occasions.
- The traffic problems are only going to increase as the Campus expands and the surrounding community elements encroach. Measures should be undertaken to protect pedestrians and to gain control of speeds on the main road. The major signage at each entrance is not impacting vehicle usage sufficiently, no matter how imposing, see figure 4.
- The lighting on the parking lots is of a type (pressure sodium's) that is not conducive to CCTV coverage. The spectrum of these lights is not of a type to allow the highest quality of CCTV images.
- Lighting on the road up to the 09-Maintenance/ Receiving/Custodial Building is insufficient for the heavy usage it gets by Custodial staff during the evening hours. The same applies to the North service road to the rear of 08- the Performing Arts Center.

SECURITY – POLICE FORCE

Figure 1 – One of three Campus Police vehicles outside of the West end of 10-Gymnasium.

Figure 2 – Light on over Lecture Hall doors at 2:30 PM, on a Sunday.

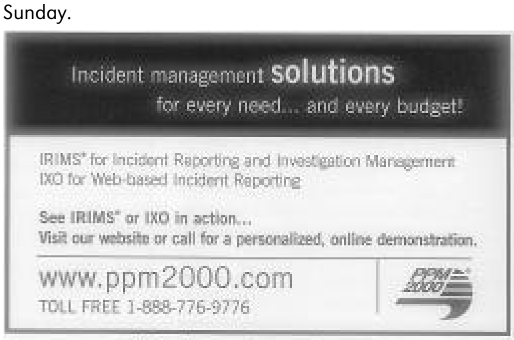


Figure 3 – One example of a proven product, which performs the suggested procedures.

Existing Conditions

- The current coverage levels are one officer per shift. This is never a "good" situation as there is no redundancy.
- The existing force could be leveraged through the introduction of several of the aforementioned "systems" additions and enhancements. Consideration should also be given to the utilization of security officer level personnel to handle parking related matters.
- At present, the Police make cash pickups and deliveries. This is a function that could be returned to the staff from the areas that generate the potential deposits. In many cases, the amounts involved are minimal, and the use of a sworn officer in uniform only draws attention to the procedure. Of course, there are the coverage level and response time considerations to be made with the involvement of the Police in this function as well.
- The force needs to reinstate the proper level of training. As the Campus grows, their capabilities need to keep pace. Technology and computer training should be part of the on-going process. The ability to leverage the existing force through the application and utilization of technology depends on their capability to interface with same.
- Communications needs to be considered as a critical and permanent position. Permanent, trained staffing should be available to cover call-sicks, training, and special events. Currently, clerical staff from other areas are asked to cover the above, as an adjunct duty and sometimes on overtime, when there are shortages in manpower.
- The Police, being the one department that is on duty at all times, should be allowed to access and be trained in the operation of the lighting circuits across the Campus. There are numerous occasions where savings could be realized if they were able to access the switching, and the time may arise when they might need to turn on circuits, (see figure 2, to the left).
- Currently, reports by the Police Force are generated and compiled by hand. Consideration should be given to obtaining and utilizing one of the available software programs that cover much of this process and automatically produce both the required and desired reports, (see figure 3, on the left).
- The role of the force would be greatly aided if there were some extensions to when staff would be on-site, for example after 11 PM and on weekend nights. Currently, the potential for doors ajar and related problems exists at all times. This detracts from patrol for trespassers, etc., which is increasing with the growth of the Campus and its surroundings.

SECURITY – EMERGENCY MANAGEMENT

Current Conditions

- At present, the Campus is planned as a Regional Evacuation Center by the County Sheriff and Fire Departments for major disasters such as earthquakes. This designation will only solidify and expand, as the build out of the surrounding communities transpires. The major drivers in this designation are the athletic field, which provides a superior helicopter landing area, and the surrounding "golf course", which provides ample area for a sizable "tent city".
- When such an eventuality transpires, it is incumbent that the Campus Police have already established the intimate knowledge of the expectations of the planning. This awareness comes from constant contact with the agencies mentioned and the participation in some of the same training and drills that they undergo. At present, this interface is lacking.
- A simple example of the above: The Sheriff's Department has requested that they would like to have floor plans of all the structures on the site and area plans of the Campus on file, for preparedness in the event of an incident. The Police do not have access to such plans. It would also be advantageous for copies to be available in their vehicles, which is where they would need to be for the most rapid employment. This need for plans applies to any situation that calls for a response, especially if it were SWAT related, not just earthquake.
- There is a tremendous resource on campus in the Fire and Paramedic Programs. Program Staff should be involved in upgrading the Campus' preparedness and in interfacing with the Police Force in emergencies. Training courses such as Earthquake Management, as offered by: The California Specialized Training Institute, (CSTI), in San Luis Obispo area should be undertaken. This is a State run offering and the costs are minimal for governmental employees. The knowledge and contacts derived are well worth the time and expenditure, and it would put the Police Force on a par with other local responders.
- Evidence of Campus preparedness such as water, medical supplies, waste, body preservation, and food stores were not observed. The amounts available in the cafeteria and the Fire/Paramedic programs may not meet the needs. Given a loss of power, consideration needs to be given to self-generation. The Campus may need to maintain the majority of those present at the time for an extended period.
- The CDC should be given special consideration.
- No evidence of earthquake gas shutoff valves was observed. This may render certain areas and/or buildings as "part of the problem", and not, at least, a neutral element

SECURITY - CONCLUSION

As mentioned in the Introduction, the College Campus has enjoyed a long period of low level security requirements. The evidence, both in projection reports and local observation, of new roads and civil engineering flags, leads to the conclusion that this period is rapidly coming to an end. One only need visit the upper water tank and observe the fresh graffiti for proof. Meeting the demands of a safe educational environment that will not present the District with an unacceptable level of liability dictates that change in equipment, methods, and procedures are undertaken in the security arena. Rather than throw additional work forces at the problems as they arise, it is our recommendations that the judicious application of security technology and the re-thinking on the uses of the existing Police Force be undertaken. There is still time to re-align the existing security systems and Police Force to be able to cope with the changes before they are overwhelmed. The ability to meet future demands without creating a disproportionate financial drain to the primary role of the College resides in introducing leveraging and force multiplying systems elements and procedures, so that they are in place well before the capabilities are required.

I | SITE SIGNAGE

SITE

Figure A – Project entry monument.

Figure B – Project monument at center of campus.

Figure C – Parking lot identification sign.

Vehicular Wayfinding

Campus Drive serves as the only campus access and enters off Sand Canyon Road. There are two entrances into the campus serving as a South and West entry onto this connector road.

Project monument signs are located at each entrance providing a sense of arrival onto the campus (see figure A). There is an additional monument located at the central quad, parking lot D, visitor's entrance and parking (see figure B).

A series of parking lots along Campus Drive provide direct, front door access to specific buildings/departments within the campus. These lots are identified by parking lot identification signs that list those buildings/departments served by each lot (see figure C). These signs currently provide the only means of wayfinding along Campus Drive but require the motorist to scan each sign for their destination. A clear directional sign system identifying up coming destinations is missing. Visitors and new students are not provided with directions to visitor parking, admissions or administration. Deliveries are not addressed nor are accessible parking lots.

The existing lot identification signs have no illumination for evening visibility. Existing graphics contain parking restrictions that appear larger and more important than the lot and building/department identification.

Recommendations:

Provide a vehicular directional wayfinding system along Campus Drive that identifies a list of buildings/departments and visitor information along with directional arrows to direct motorists and provide destinations that lie ahead. This system should be designed with flexibility in mind allowing for future expansion and modifications. Internal or external illumination should be incorporated. If additional ambient lighting along road and lots are provided, signs could be non-illuminated with reflective copy.

Provide in combination with matching parking lot identification signs increasing legibility of lot I.D. letter and building/department copy. Reduce size of permit information and provide lighting as stated above.

SITE

Figure D – Freestanding building identification sign.

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Figure E – Wall mounted building identification.

Pedestrian Wayfinding

Parking lots serve as pedestrian entrances into building clusters and onto primary/secondary walkways. From this point there are no wayfinding signs to provide directionals to buildings and/or departments. There are no directory maps to provide an overview campus plan with buildings/departments identified.

Buildings are identified by a freestanding illuminated concrete building identification sign (see figure D) and/or non-illuminated building mounted wood sign panels (see figure E). Buildings have multiple entrances that can be accessed from both primary and secondary pedestrian paths yet they lack identification of the building's name and/or departments within. Most classrooms have exterior entrances with no interior hallways and lack building identification at their door.

Building mounted signs are limited to one entrance only and have limited visibility because multiple approaches and doors are used. These signs have no evening illumination and do not enhance the architecture.

There are a few freestanding signs but not enough to provide a system of identification, and their quantity, scale, location and color render them invisible. The scale of the sign panel limits the size and content of the graphic to properly identify the building names and departments. Their size is overpowered by the landscaping and architecture. The concrete fabrication provides no visible contrast against the architecture.

Recommendations:

Identify the primary walkway with a series of wayfinding directionals providing directional arrows addressing specific buildings/departments along the walkway. This system should be designed with flexibility in mind allowing for future expansion and modifications. Ambient lighting should be sufficient.

Visible from this walkway, provide freestanding building identification signs that list departments within. These signs should have scale, color and internal illumination. Multiple locations may be necessary.

SITE

Provide building mounted wall signs that can be installed at all entry points to building/department and visible from all approaches. Utilize an architectural contrasting material and color to add visibility. Exterior or ambient lighting should be sufficient.

Provide freestanding illuminated directory maps/kiosks at central quad and at other key points for use by visitors and new students. Map would show campus plan and identify building names and departments.

SITE SIGNAGE

Figure 1 – View of project entry monument. Typical for both campus entries.

Figure 2 – View of project monument at center of campus.

Project Monuments (see figures 1 & 2)

Existing signs are showing signs of decay. Concrete is cracking and concrete color stain is fading. Letter finish is faded. Illumination is inadequate to light entire sign element. Landscaping is incomplete or is in need of maintenance.

Option A Recommendation:

Refinish and repair concrete structure. Refinish existing letters and provide higher degree of contrast to the background. Replace illumination with continuous lighting mounted at base and concealed within landscaping. Provide, replace or repair landscaping.

Option B Recommendation:

Replace existing signage with new monuments, lighting and landscaping.

Figure 3 – View of project entry restrictions sign. Typical for both campus entries.

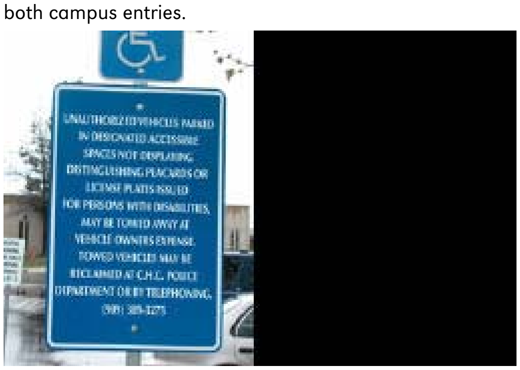


Figure 4 – View of accessible parking entry sign. Typical at all parking lot entrances.

Project Entry Restrictions (see figure 3)

Existing signage is scaled too large and multiple sign messages are redundant.

Recommendation:

Replace existing signage with clear and concise graphics and message. Sign should be reduced in scale and can incorporate accessible parking entry sign message (see figure 4). The accessible parking code information is only required at the two entry points of the campus and is not required at each parking lot entrance.

SITE SIGNAGE

Figure 5 – View of typical parking lot identification sign.

Figure 6 – View of parking lot "A" identification sign with added directional sign.

Figure 7 – View of temporary parking lot sign.

Figure 8 – View of typical parking permit information.

Parking Lot Identification (see figure 5)

Existing signs lack design sensibility. Permit information is larger than lot and building identification and takes away from wayfinding message.

Figure 6: Multiple signs appear at the same location with different messages. One sign is parking lot identification and the other is a building and lot directional sign.

Figure 7: Temporary lot sign does not match other signage.

Figure 8: Multiple parking permit information signs appear throughout the lot although the same message appears on the parking lot identification sign at the entrance.

Recommendation:

Replace existing signage with new signage system. Lot identification and building identification graphics should be the most important message. Minimize the size of the parking permit information or remove it to another sign. Include additional directional information within the same sign.

SITE SIGNAGE

Figure 9 – View of typical accessible parking stall sign.

Figure 10 – View of typical staff parking sign.

Figure 11 – View of reserved parking stall sign.

Figure 12 – View of visitor parking stall sign.

Pole Mounted Regulatory Signs (see figures 9 - 12)

Existing signs lack design sensibility and continuity of color and graphics. Some sign poles have been bent from cars hitting them.

Recommendation:

Replace all regulatory signs with new signage system of matching color, graphics and design. Provide wheel stops at end of stalls to eliminate bent poles.

1 | LABORATORY/ ADMINISTRATION

01 LABORATORY/ ADMINISTRATION

SQUARE FOOTAGE:

	ASF	GSF
FIRST LEVEL	9,205	16,915
SECOND LEVEL	11,050	15,255
THIRD LEVEL	3,665	6,035
TOTAL	23,920	38,205

01 LABORATORY/ ADMINISTRATION

FIRST LEVEL - NORTH

1" = 20'

Two code-compliant exits required

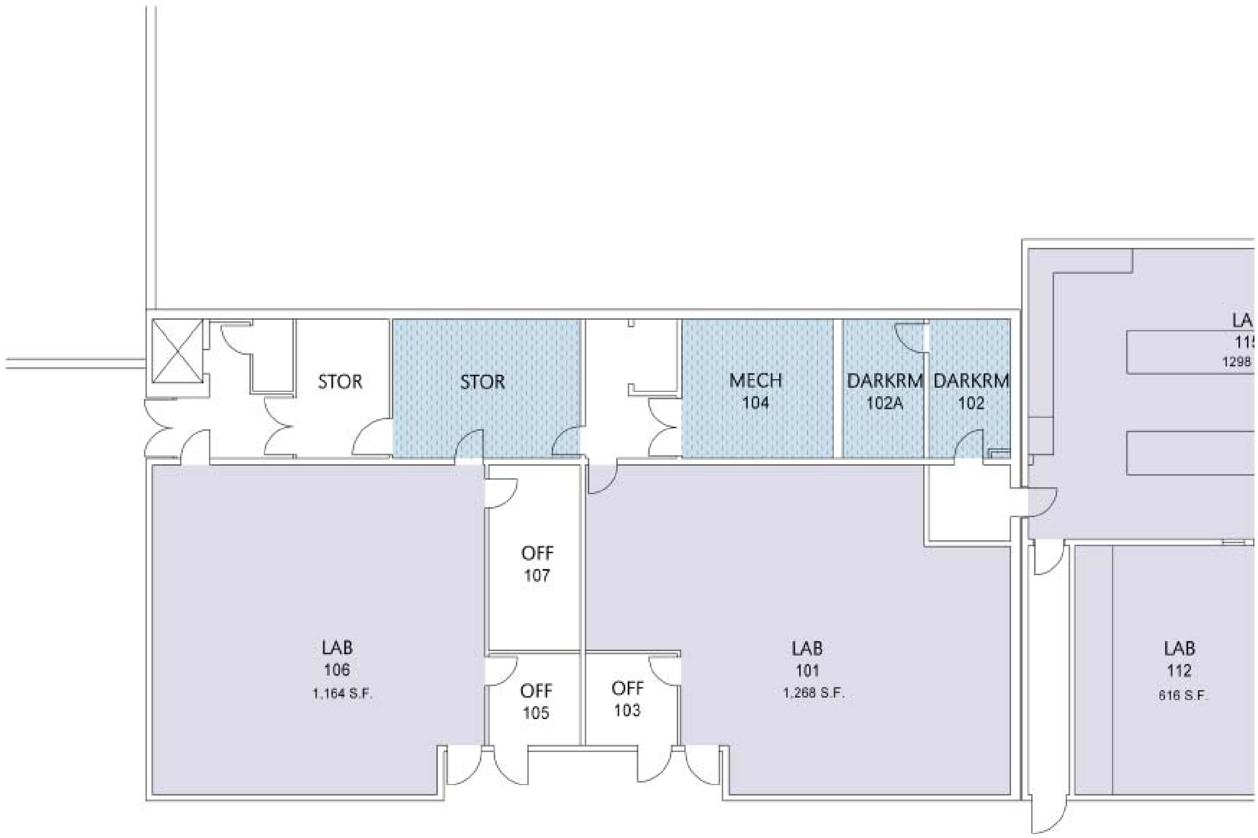
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION



FIRST LEVEL - SOUTH (1 of 2)

1” = 20’

Two code-compliant exits required

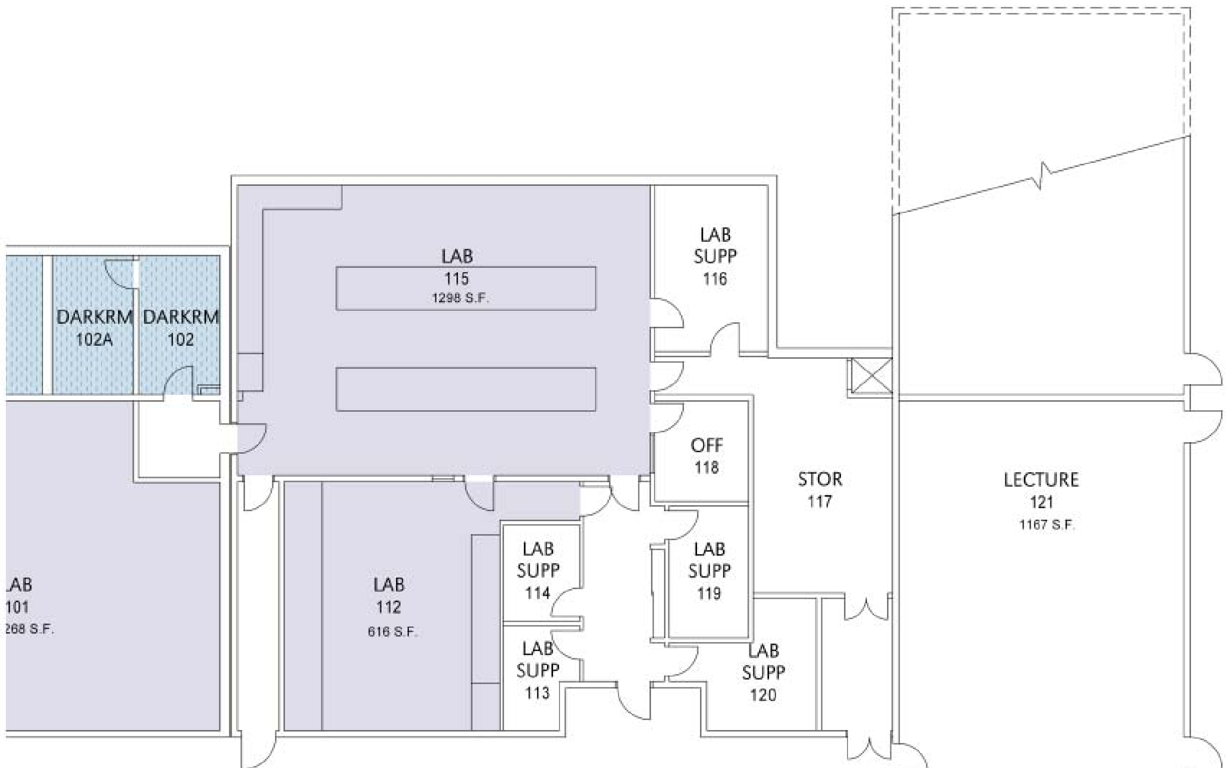
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION



FIRST LEVEL - SOUTH (2 of 2)

1" = 20'

Two code-compliant exits required

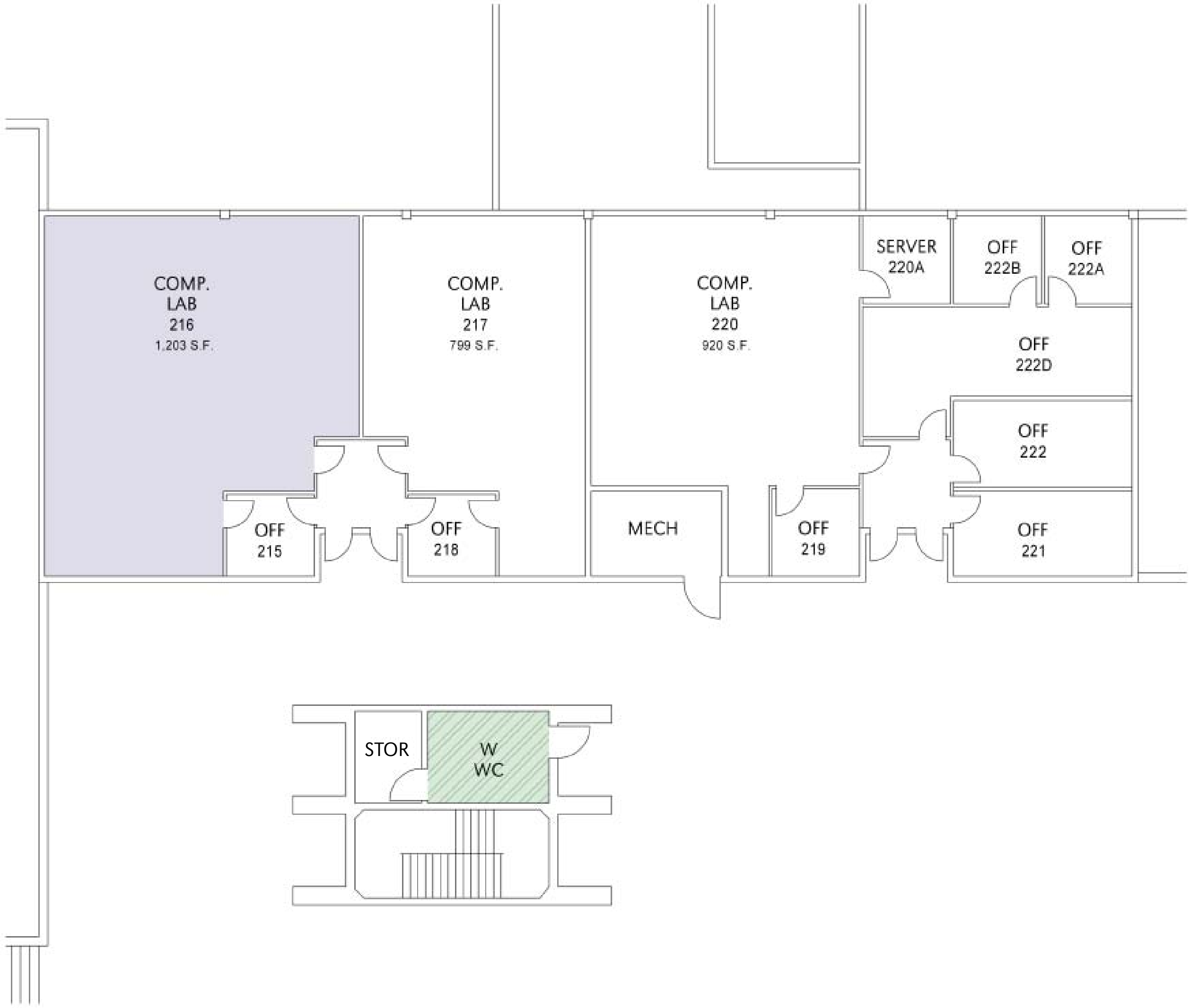
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION



SECOND LEVEL - NORTH

1" = 20'

Two code-compliant exits required

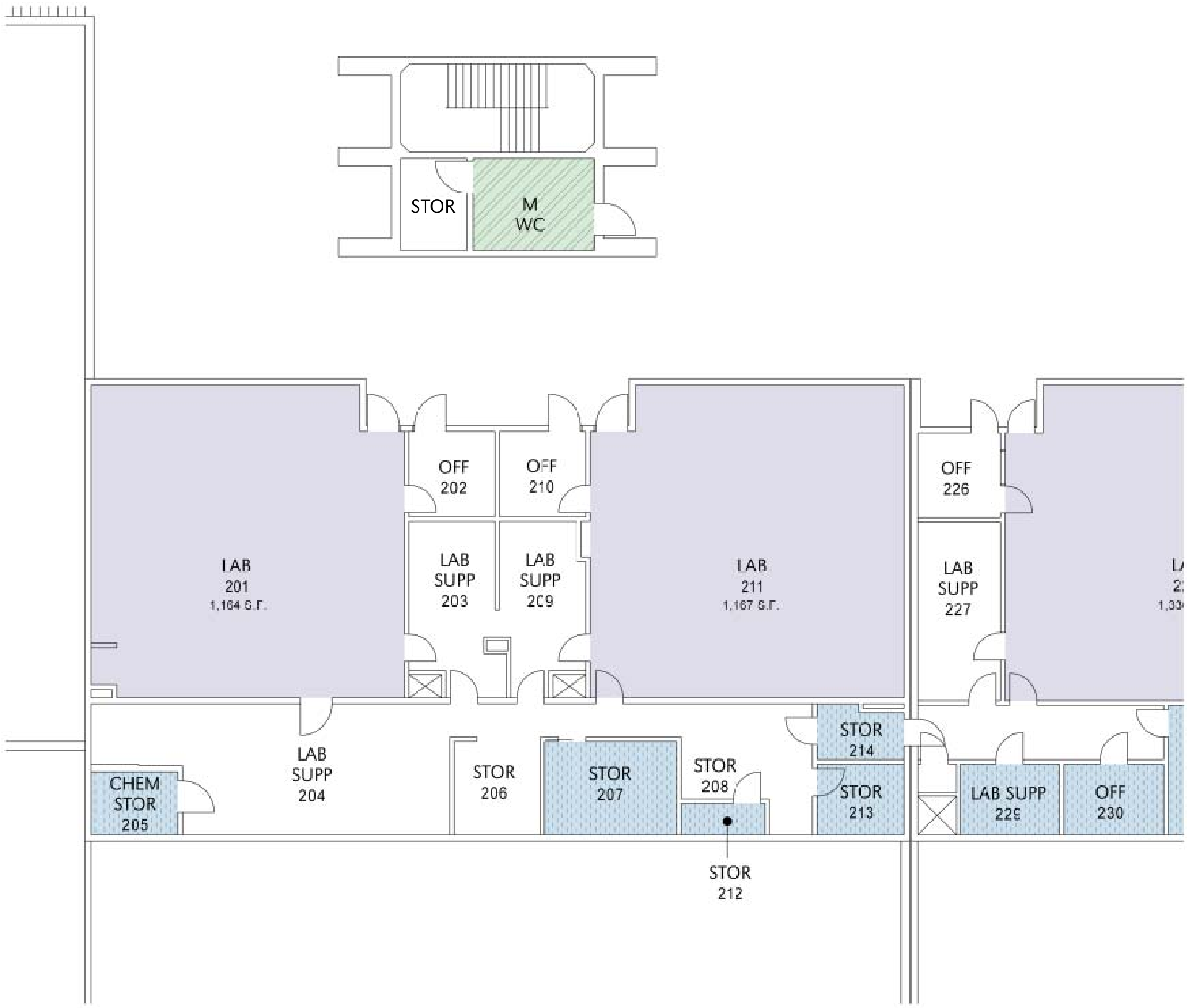
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION

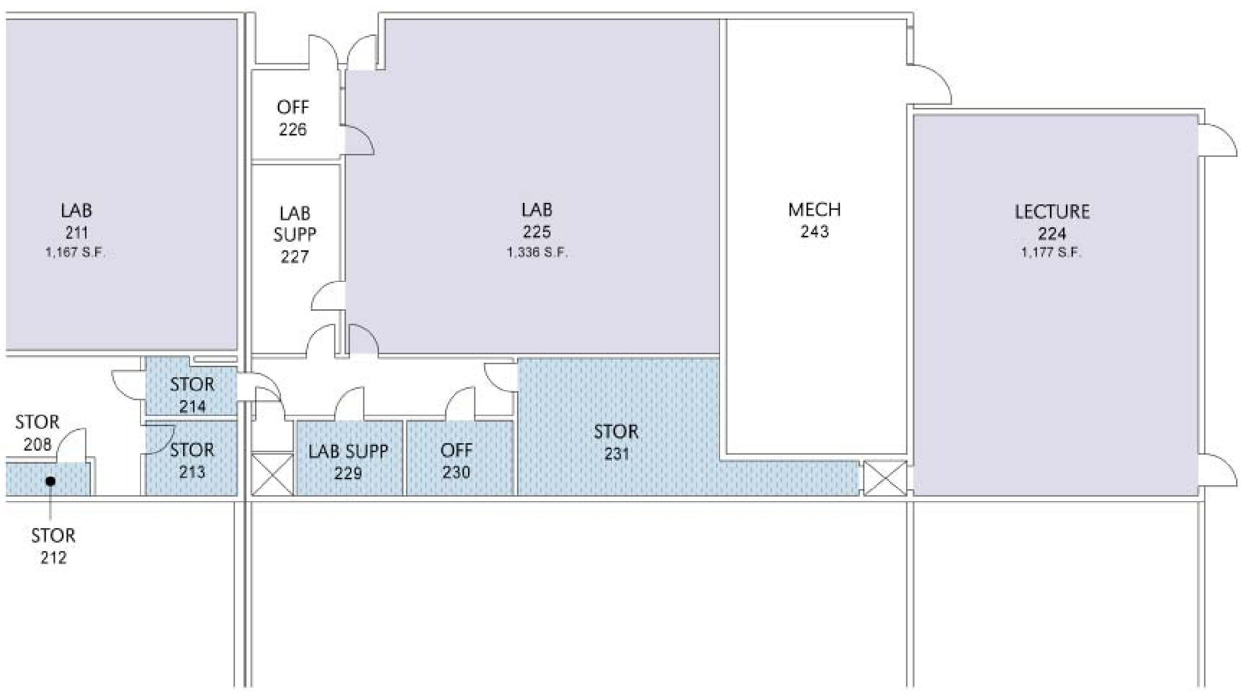


SECOND LEVEL - SOUTH (1 of 2)

1" = 20'

Two code-compliant exits required	More than one intervening room to exit
Inaccessible area (non-ADA)	Non-compliant exit route
Sprinklered area	

01 LABORATORY/ ADMINISTRATION



SECOND LEVEL - SOUTH (2 of 2)

1" = 20'

Two code-compliant exits required

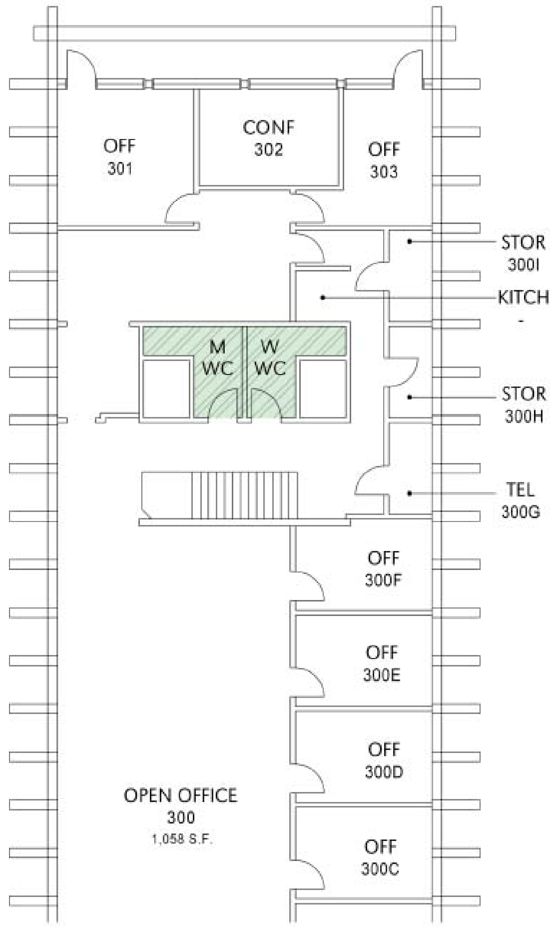
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION



THIRD LEVEL (1 of 2)

1" = 20'

Two code-compliant exits required

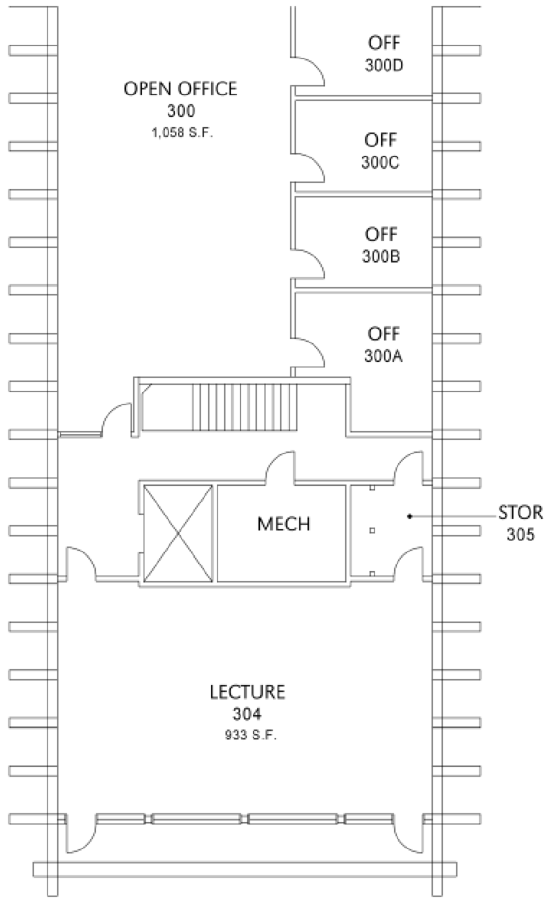
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

01 LABORATORY/ ADMINISTRATION



THIRD LEVEL (2 of 2)

1" = 20'

Two code-compliant exits required

Inaccessible area (non-ADA)

Sprinklered area

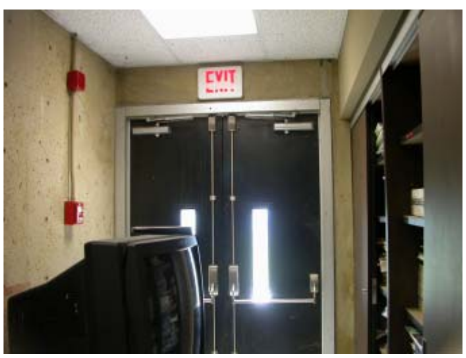
More than one intervening room to exit

Non-compliant exit route

01 LABORATORY/ ADMINISTRATION

Lab 201 - Non-compliant seating and fixtures.

Lab 225 - Non-compliant seating and fixtures; low light levels.



Exit corridor - Exit passage blocked due to storage items.

Storage room - Temporary partitions have been installed that render room inaccessible.

Fire & Life Safety

- No fire sprinklers or smoke detectors.
- Lack of fire rated doors and/or doors with UL rating have been painted over.
- Illuminated exit signs missing from some areas.
- Electrical panels are not located in closets.
- Exposed electrical and data conduit throughout
- Exit passages are used as storage areas.
- No GFCI outlets throughout.

ADA

- Lack of compliant workstations in labs.
- Lack of compliant door hardware throughout.
- Pocket doors need to be replaced with compliant doors.
- Lack of compliant fixtures at lab sinks and workstations.
- Thresholds at doors need to be replaced.
- Non-compliant toilet rooms and fixtures.
- Non-compliant handrails and handrail extensions.
- Contrast warning stripes must be added to treads at stairs.
- Non-compliant drinking fountains.
- Non-compliant pay phones.
- Lecture halls lack accessible seating.

01 LABORATORY/ ADMINISTRATION

Water damaged ceiling

Inadequate ventilation - Office converted for use as server room. Existing systems cannot handle heat load.

Lecture hall seating - Many seats and tablet arms in the lecture halls are damaged.

Roof at first level south – Clogged drains, blistering and ponding are common problems.

Maintenance

- Prevalent water damage to ceilings and walls at first level.
- Acoustic and glue-on ceiling tiles need to be replaced due to water damage and/or loss of adhesive.
- Flooring (carpet, linoleum, VCT) needs to be replaced due to stains, gouges, or wear.
- New paint needed at gyp board walls.
- Light levels in labs and lecture halls are insufficient.
- Replace diffuser grills.
- Replace wall base throughout.
- Closers at some doors are broken or do not work due to interior air pressure.
- Existing roofs are a built-up roofing system.
- Roofs show signs of water ponding.
- Roof and overflow drains are filled with debris.
- The strainer is missing from many of the drains, causing drains to become clogged
- Patched roof areas are
- Severe blistering throughout the roof, blisters as high as 2-3 inches.
- Blisters in some areas have started to crack, creating areas for potential leaks.
- At some areas of the roof perimeter the flexible flashing has started to delaminate.
- Due to large trees overhanging the roofs, a significant amount of leaves have collected on the roof thus preventing water from flowing smoothly and clogging drains.
- Roof hatches do not meet current standards, difficult to open & close
- At the Admin bridge roof, the flashing at roof top equipment is cracked and delaminating.

01 LABORATORY/ ADMINISTRATION

Building Description

Site and Building Configuration

The Laboratory/Administration site consists of 4 separate structures. The north laboratory/equipment structure, the center administration structure, the south laboratory area, and the southeast laboratory/lecture hall structure. The site slopes down in the north direction at the north structure and slopes down in the south direction at the south and southeast structures. The north, center, and south structures were constructed in 1970 and the southeast structure was constructed in 1977. The total square footage for the structures is 30,621.The north structure is two stories high with the second floor approximately 15 feet high and the roof approximately 28 feet high. The center structure is two stories high with the second floor approximately 19 feet high and the roof approximately 34 feet high. The south structure is two stories high at its center with the second floor approximately 15 feet high and the roof approximately 28 feet high. The north 35 feet and the south 35 feet of this structure is one story high. The southeast structure has lecture halls on its east side, which slope down to the south. The roof of the south lecture room is approximately at the height of the north lecture room floor. The height of the low roof is approximately 15 feet and the high roof is approximately 15 feet above the low roof.

Structural System

Structural plans were available for this building. The primary roof and floor gravity system for the north, center, and south structures consists of concrete decks spanning to concrete beams or concrete walls. The primary roof gravity system for the south east structure consists of plywood spanning to 2 x rafters spanning to steel beams or wood ledgers bolted to concrete walls. The primary elevated floor gravity system for the southeast structure consists of concrete decks spanning to concrete beams or concrete walls. The foundation system consists of a combination of spread footings and continuous footings. Evidence of settlement was not observed. The primary lateral system for the north, center, and south structures consists of concrete diaphragms spanning to exterior and interior concrete walls.

The primary roof lateral system for the southeast structure consists of plywood sheathing diaphragms spanning to exterior and interior concrete walls. The primary floor lateral system for the southeast structure consists of concrete diaphragms spanning to exterior and interior concrete walls.

01 LABORATORY/ ADMINISTRATION

Overall Seismic Deficiencies and Expected Seismic Performance

The north, south and southeast structures have well distributed lateral load resisting concrete walls. However, for the southeast structure only, the connection of the concrete walls to the plywood diaphragm appears to be inadequate. ESI recommends analysis and strengthening of the wall to roof diaphragm connections and adding crossties for the full width of the building to a standard similar to Los Angeles City Division 91. An example of wall to roof ties is shown in figures 1, and 2, and an example of cross ties are shown in figure 3. Ties are shown for budgeting purposes only and will be revised base on future analysis. Also, for the center structure only, the north south lateral load resisting walls appear to be inadequate at both the first and second level. ESI recommends analysis of the lateral load resisting concrete walls to determine if they possess adequate strength to resist seismic loads. Included is figure 4, which shows the location of the proposed two story walls. The length and location is shown for budgeting purposes only and will be revised based on future analysis. In a seismic event the windows and non-bearing gypboard walls would probably suffer typical damage in the form of broken glass and cracked gypboard walls. The ceiling would probably suffer typical damage in the form of cracked and displaced tiles.

01 LABORATORY/ ADMINISTRATION

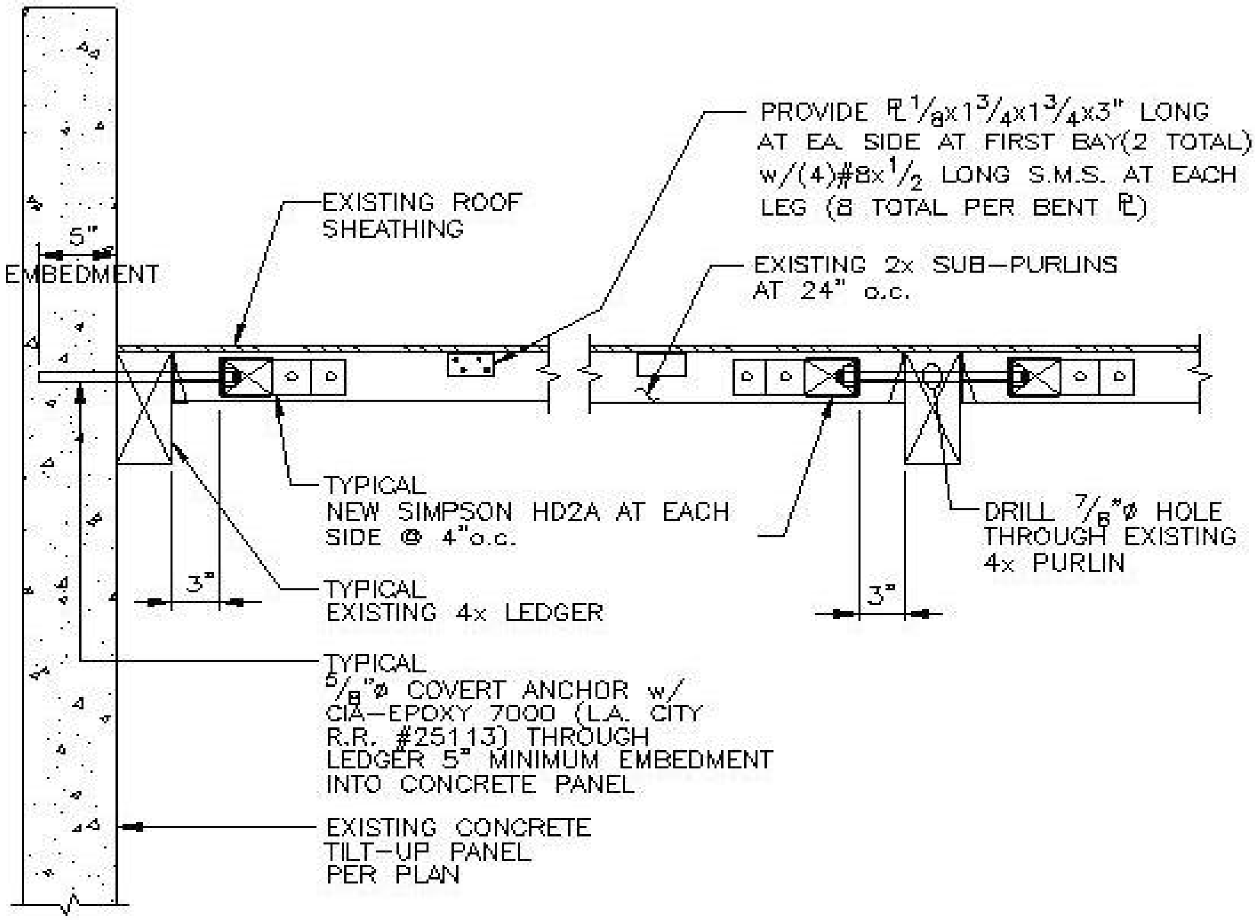


FIGURE 1. TYPICAL SUB-PURLIN TO EXISTING CONCRETE CONNECTION DETAIL

01 LABORATORY/ ADMINISTRATION

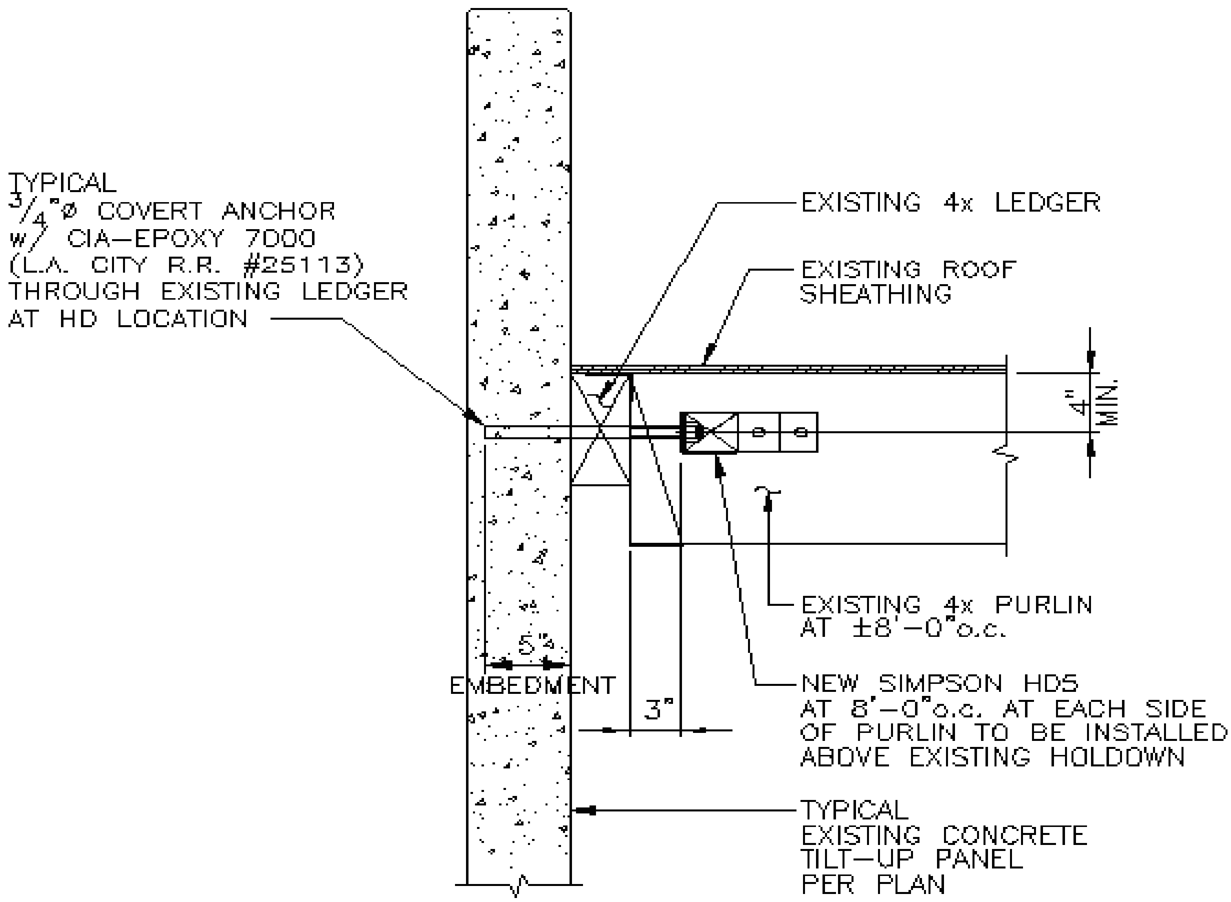


FIGURE 2. TYPICAL PURLIN TO EXISTING CONCRETE CONNECTION DETAIL

01 LABORATORY/ ADMINISTRATION

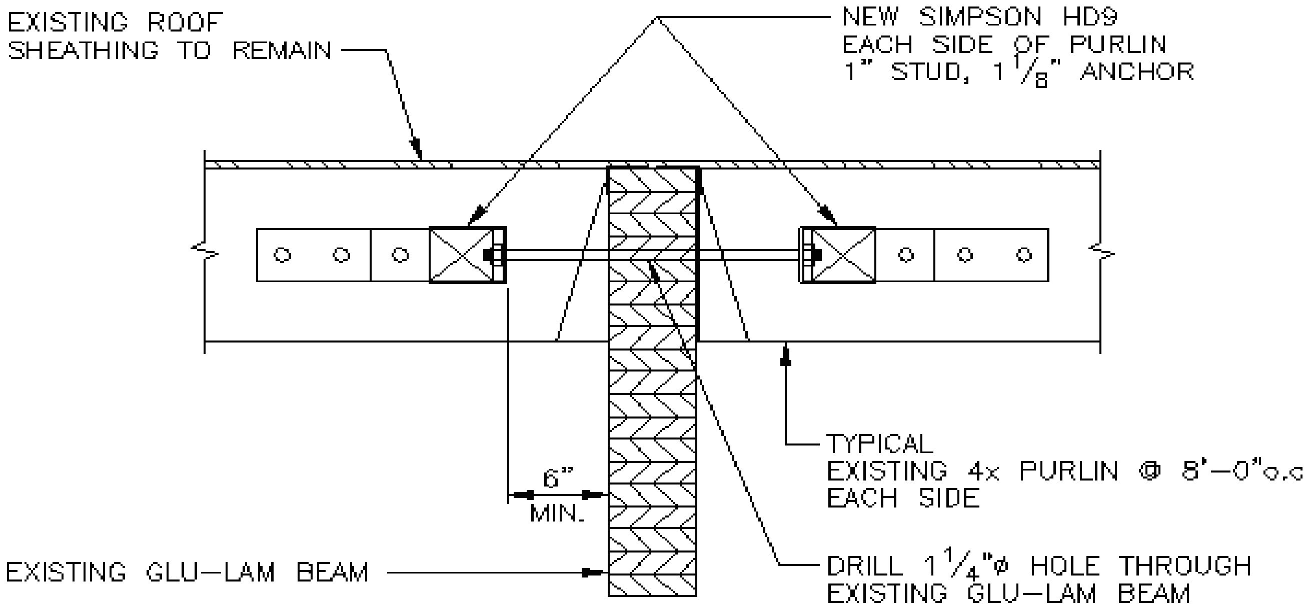


FIGURE 3. TYPICAL CROSS TIE PURLIN TO GLULAM BEAM CONNECTION DETAIL

01 LABORATORY/ ADMINISTRATION

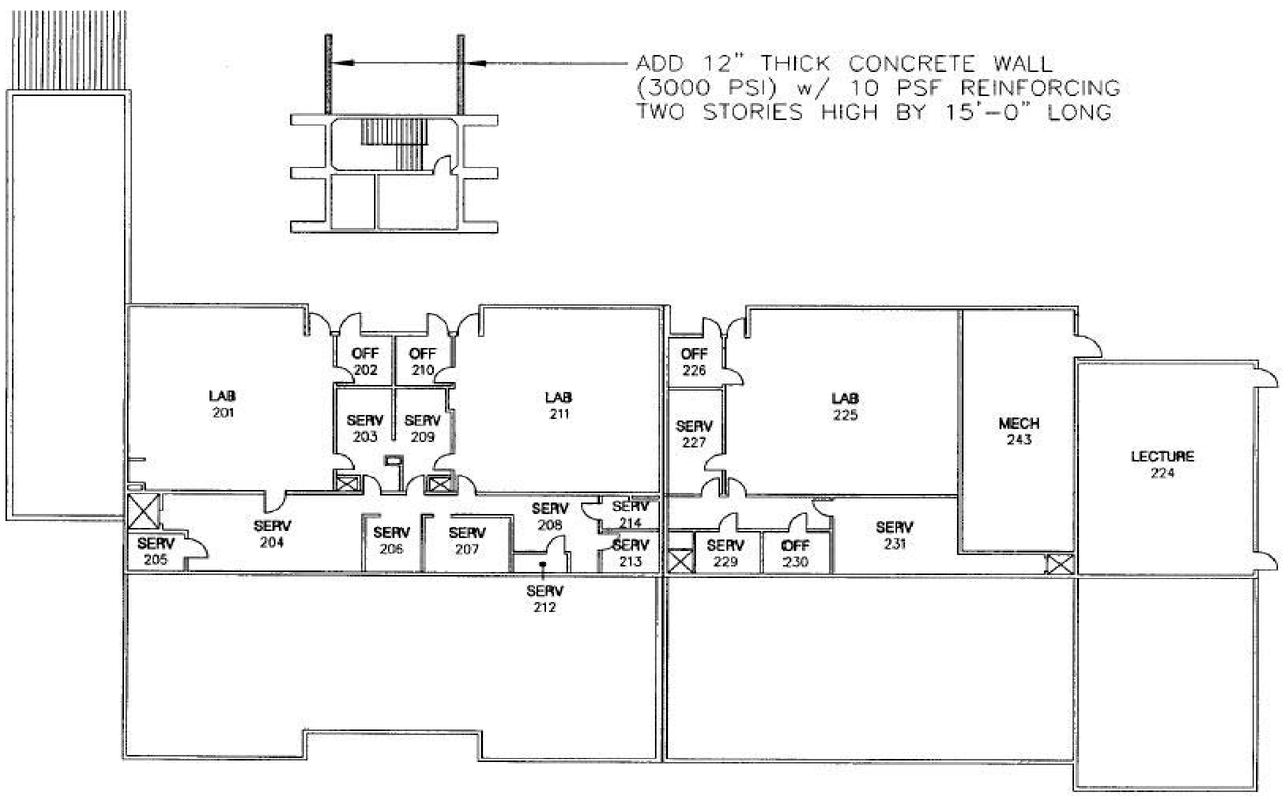


FIGURE 4. PROPOSED ADDITIONAL WALL LOCATION

01 LABORATORY/ADMINISTRATION

General Description

The Laboratory and Administration building is a two story building that was constructed in 1970. The old bookstore, work rooms and main campus heating hot and chilled water plants are located in the north building. The laboratory classrooms and additional work rooms are located in the south building. The second floor is occupied by the administrative department.

Several retrofits that have been done include: An additional chiller and boiler were added to the main campus chilled and heating hot water plants in 1975. The office space in the administrative department was expanded in 1978 and an addition to the south building was added in 1978. New cooling towers were installed in 1999. New boilers and chiller renovations are currently in the scope of work to be done by Siemens.

A double deck constant volume multi-zone air handling unit supplies the majority of conditioned air to the north building. Two fan coil air handling units located in the ceiling currently serve the old bookstore. All air handling units receive the necessary heating hot and chilled water from the main campus boiler and chiller plants. The south building is served by a double deck constant volume multi-zone air handling unit located in the mechanical room. The laboratory classrooms and a chemical fume hood are exhausted via a utility fan located in the administrative building. The two story addition built adjoining the south building is served by two double deck constant volume multi-zone air handling units located in the same mechanical room. The addition also contains three chemical fume hoods operated by individual utility fans located in the mechanical room. The air handling units receive the required heating hot and chilled water from the main campus boiler and chiller plants. The administrative portion of the building is served by a double deck constant volume multi-zone air handling unit and a constant volume single zone air handling unit. Each air handling unit is located in its own mechanical room. The air handling units receive the required heating hot and chilled water from the main campus boiler and chiller plants.

Deficiencies

General

- No insulation is provided for the walls and roof.
- Thermostats are mounted at heights noncompliant with the American's with Disabilities Act (ADA).
- No seismic bracing is provided for the piping and the ductwork.

Mechanical Room #103

Contains one multi-zone air handling unit.

- Spring vibration isolators for the air handling unit are shot and need to be replaced.
- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.

01 LABORATORY/ADMINISTRATION

Figure 1 – Example of vibration isolators that are shot and need to be replaced.

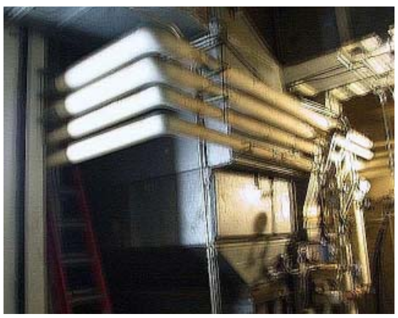


Figure 2 – Example of no seismic bracing on the piping or the duct work.

Figure 3 – Example of door gaskets that need to be replaced.

Figure 4 – Example of a plumbing vent less than 3'-0" away from a building opening.

- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.

Mechanical Room #227
Contains one multi-zone air handling unit.

- There is no 3'-0" code required minimum clearance provided in front of electrical panels and Variable Frequency Drive.
- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Mechanical Room #245
Contains two multi-zone air handling units and several utility fans provided for the chemical fume hood exhaust.

- No P-trap is provided on the condensate drains, allowing units to leak conditioned air through the pipes.
- The air handling units and ductwork need environmental cleaning.
- The gaskets on both air handling units' doors need to be replaced.
- Both air handling units' interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling units' are shot and need to be replaced.

Mechanical Room #301
Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.
- Motor cover is missing.

01 LABORATORY/ADMINISTRATION

Mechanical Room #406

Contains one single zone air handling unit and laboratory and chemical fume hood utility fan.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.
- Plumbing vent is less than the 3'-0" code required clearance from outside air intake.
- The outlet of exhaust fan 10 serving the chemical laboratory is less than the 10'-0" code required clearance from an outside air intake.

Central Plant (117, 118, 119)

- Chillers and boilers renovation/replacement is currently in the scope of the performance contract work provided by Siemens.
- According to the maintenance building supervisor the underground chilled and heating hot water distribution system has developed numerous leaks and has severely deteriorated. This causes frequent system shutdown for maintenance.

Recommendations

- Replace the bearings on the fans.
- Replace the fans' sheaves and belts.
- Environmentally clean the air handling units and ductwork.
- Refurbish the air handling units.
- Install P-traps on condensate drains.
- Replace vibration isolators on the air handling units.
- Replace the gaskets on the units' doors.
- Replace the interior liners.
- Move outlets away from outside air inlets and building openings.
- Install seismic bracing on the piping.
- Install seismic bracing on the ductwork.
- Lower the height of the thermostats to ADA levels.
- Replace existing underground chilled and heating hot water distribution systems.

01 LABORATORY/ADMINISTRATION

General Description

- The Laboratory and Administration complex consists of three buildings that were constructed in 1970. Retro-fit work was done in 1978 which expanded the office spaces in the Administration building.

Piping

- Domestic hot and cold water piping are galvanized steel. Some part of the piping has been rusted out.
- Gas piping system is galvanized steel. Gas pressure regulator outside the building delivers gas at low pressure to the building. Gas piping is in fair condition.
- Waste piping is service weight cast iron.
- Laboratories waste and vent piping is polypropylene acid waste pipe.

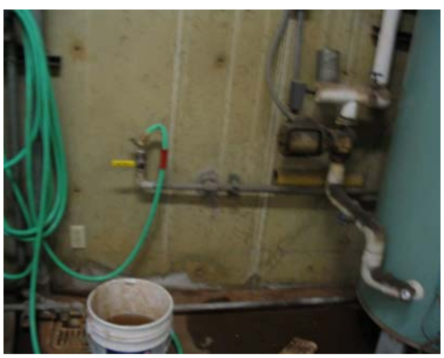
Fixtures

- Level 2330 public toilets, water closets are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Toilet rooms on level 2350 have floor mounted flush tank water closets.
- Urinals are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Lavatories are wall mounted with newly furnished Geberit automatic faucets. Units are in fair condition.
- Floor drains do not have trap primer; therefore they do not comply with current code.
- Floor sinks in equipment room #227 and #301 do not connect to trap primers, and the room is being used as outside air plenum; therefore they do not comply with the current code.
- Hose bibs in and outside of the building do not have vacuum breakers; therefore they do not comply with current code.

01 LABORATORY/ADMINISTRATION


Electric water heater


Gas water heater


A hose bibb without vacuum breaker


Air compressor

Equipment

- Each public toilet is served by an electric water heater located in adjacent custodial room #217 and 218. The water heaters do not have expansion tank and earthquake straps; therefore they do not comply with current code. Units are in fair condition.
- A gas water heater is located in boiler room #118 without expansion tank and earthquake straps serving level 2330. The unit is not operational.
- An electric water heater is located in mechanical equipment room #103 without expansion tank and earthquake bracing; therefore they do not comply with current code. Units are in fair condition.
- A vacuum pump is located in equipment room #103 serving the labs. Unit is in fair condition.

Fire Protection

- Building complex is covered by fire hose cabinets without hose, supplied via domestic water system.
- In Custodian rooms #217 and 218, boiler room #118, Storage room 105 level 2315, and all lab storage room level 2330 are covered by automatic fire sprinkler heads. The water supply is connected to (**Junior fire sprinkler system**) domestic water mains inside the building via OS&Y valves, check valves and flow switches.

Utilities Load

- Domestic cold water: 186 FU = **88 GPM**
- Sewer: **181 Fixture Unit.**
- Natural Gas: 6” low pressure gas entering Lab/Admin building via a gas pressure regulator.
- (2) Space heating boilers and (1) future boiler each at 3200 CFH. (2) Water heaters at 180 CFH and 120 CFH. Lab benches and fume hoods at 90 CFH.
- **Total natural gas load 9,990 CFH.**

01 LABORATORY/ADMINISTRATION

Recommendations

- Re-pipe the whole building complex and replace all galvanized domestic hot and cold water piping with copper piping.
- Provide and install a sheet metal pan with all solder joints under the 4" main domestic water line in basement running over the transformer, pipe drain line to approved receptor.
- If the building is re-piped with copper pipes, then re-rout the 4" domestic water line from overhead of the transformer in basement to another location.
- Provide and install trap primers to all floor drains and floor sinks.
- Provide and install half or ¾ grating over all floor sinks.
- Provide new hose bibs to replace existing, or install vacuum breakers at all existing hose bibs.
- In boiler room 118, level 2315, remove gas water heater and circulating pump and related piping. Provide and install point of use electric water heater for two sinks on second floor.
- Plans have been submitted to renovate first floor level 2315, west of the chiller room. An electric storage type water heater has been dedicated to serve this tenant improvement. Provide and install approved earthquake straps and bracings for all water heaters and circulating pumps.
- Provide and install gas earthquake valve upstream of the existing pressure regulator.
- Inspect all domestic water pressure reducing valves for proper operation.
- Inspect and test all backflow preventers by a certified agency for proper operation.
- Drain and clean all junior fire sprinkler systems. Test OS&Y valves, check valves and flow switches for proper operation.

01 LABORATORY/ADMINISTRATION

Figure 1 – Service equipment

Figure 2 – Oil-filled fuse cut-outs.

Figure 3 – Simplex clock system generator

Figure 4 – Zinsco panel board

Power System Description

- Service to the complex consisted of high voltage feed at 4160V stepped down by several transformers to 120/208V, 3ø, 4-wire and 480V, 3ø, 3-wire systems.
    - 300KVA transformer (T7) 4160-120/208V.
    - 300KVA transformer (T8) 4160-120/208V.
    - 500KVA transformer (T9) 4160-480V.
    - 500KVA future transformer (T10) 4160-480V.
    - 600A, 480V, 3ø, 3-wire distribution panel “DP-LA”.
    - 800A, 120/208V, 3ø, 4-wire distribution panel “DP-LB”.
    - 800A, 120/208V, 3ø, 4-wire distribution panel “DP-LC”.
- Power distribution for the building consisted of the following:
    - (14) Panel boards: L1-1, L1-2, L1-3, L1-4, L2-1, L2-2, L2-3, L2-4, L2-5, L2-6, L2-7, L3-1, L3-2 and L3-3.
    - (8) Motor control centers (MCC): LCTP, LBP, LCP, LP-1, LP-2, LP-3, LP-4 and LP-5.
    - (2) Future MCC’s: LCP-2 and LCP-3.

Lighting System

- Lighting fixtures are recently retrofitted with high efficiency fixtures by Siemens.
- General lighting consists of fluorescent fixtures with T-8 lamps.
- Exit lights are master/slave pair of overhead and low level exit fixtures with backup power.
- Exit signage is deficient. Most exit signs are illuminated.

Fire Alarm System

- Simplex Fire Alarm equipment are installed.
- Fire alarm pull stations are installed at exits.
- Fire alarm horns are installed at lobbies and corridors.
- Not ADA compliant.

01 LABORATORY/ADMINISTRATION

Figure 5 – Lighting

Figure 6 – Simplex fire alarm equipment

Recommendations

- The low voltage distribution equipment are discontinued models from Zinsco and no replacement parts are available. However, these existing equipment are still in good working condition and require regular inspection and maintenance.
- The oil-filled fuse cut-outs are discontinued models from G&W and no replacement parts are available. These equipment are in excess of their life expectancy. At this time, these equipment are still in good working condition and there is no immediate need of replacement. However, if any of the building will require renovations, replacement of all electrical equipment is strongly recommended.
- Periodic inspection of and, if necessary, torque adjustments of wire terminations at panel boards and distribution boards are recommended to eliminate possible loose connections.
- The power, lighting and life safety systems of this facility are adequate for its present requirements. Any future major additions or expansion would require a reassessment of its existing power, lighting and life safety infrastructure for adequacy.
- Exit signage should be reviewed for compliance.

01 LABORATORY/ADMINISTRATION


Figure 1 – View of Laboratory/Administration building.

Building Identification (see figure 1)

Existing freestanding illuminated concrete sign is showing signs of decay. Scale of the sign and its copy is too small for larger buildings. Concrete sign is not visible as it blends with concrete architecture. Illuminated sign panel is too small to identify buildings with several names, uses or departments. Exposed screws are visible in sign face. Illuminated faces do not provide the best copy visibility.

Option A Recommendation:

Repair concrete and sandblast to clean. Retrofit lamping and wiring. Replace acrylic panel with painted aluminum panel with routed out copy so that just the copy illuminates.

Option B Recommendation:

Replace existing signage with new sign system freestanding and/or wall mounted. Use of a consistent sign color will enable signage to be easily recognized and stand out against building color and landscape.

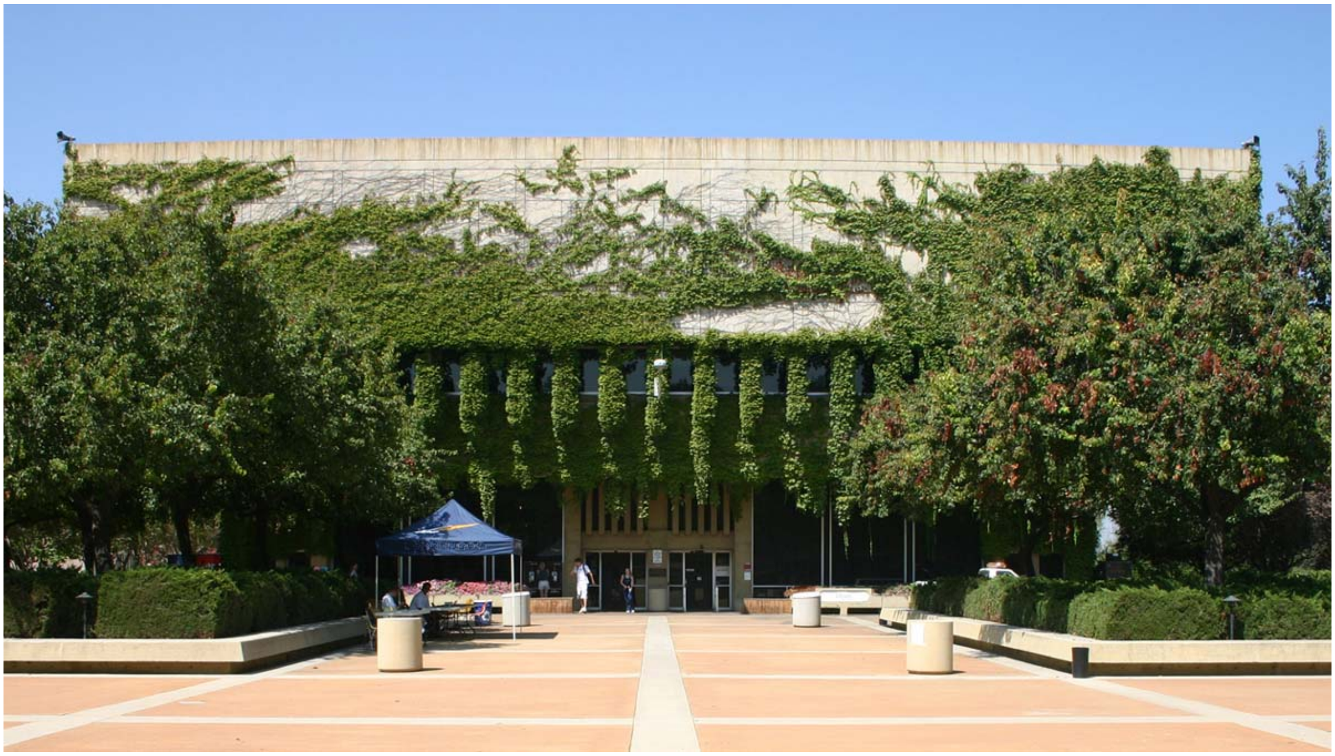
- Freestanding: Provide new illuminated painted sign cabinet with larger routed illuminated building names and/or departments.
- Wall Mounted: Provide new sign panels or individual letters mounted to building face or low walls. Sign panels/copy size scaled to size of building.

ADA:

Provide sufficient accessibility information and directionals to navigate to an accessible entrance or path.

2 | LEARNING RESOURCES/ LIBRARY

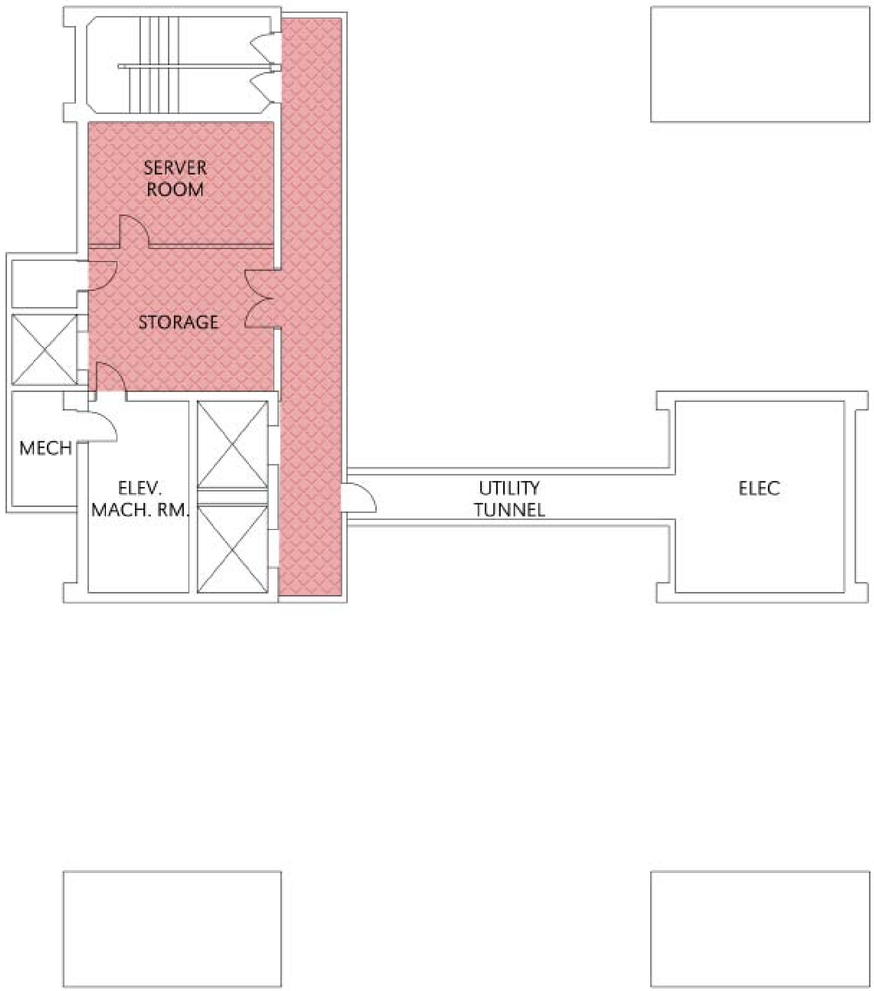
02 LEARNING RESOURCES/ LIBRARY



SQUARE FOOTAGE:

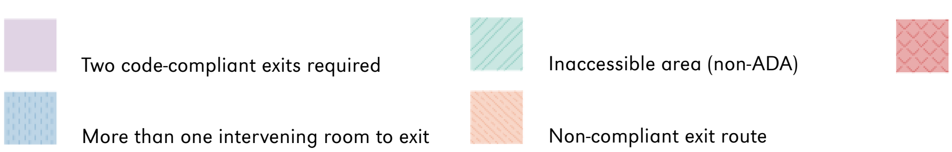
	ASF	GSF
BASEMENT LEVEL	420	2,595
FIRST LEVEL	5,905	8,045
SECOND LEVEL	9,355	12,295
THIRD LEVEL	9,515	14,600
TOTAL	25,195	37,535

02 LEARNING RESOURCES/ LIBRARY



BASEMENT LEVEL

1" = 20'



Two code-compliant exits required

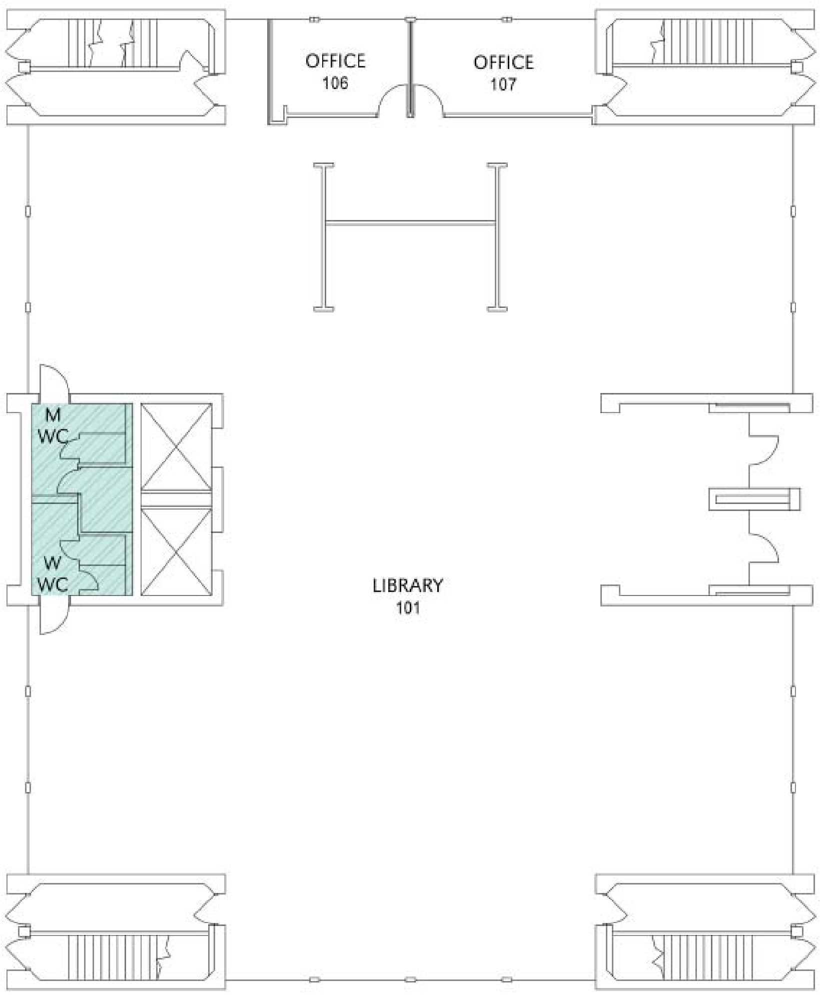
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

02 LEARNING RESOURCES/ LIBRARY



FIRST LEVEL

1" = 20'

Two code-compliant exits required

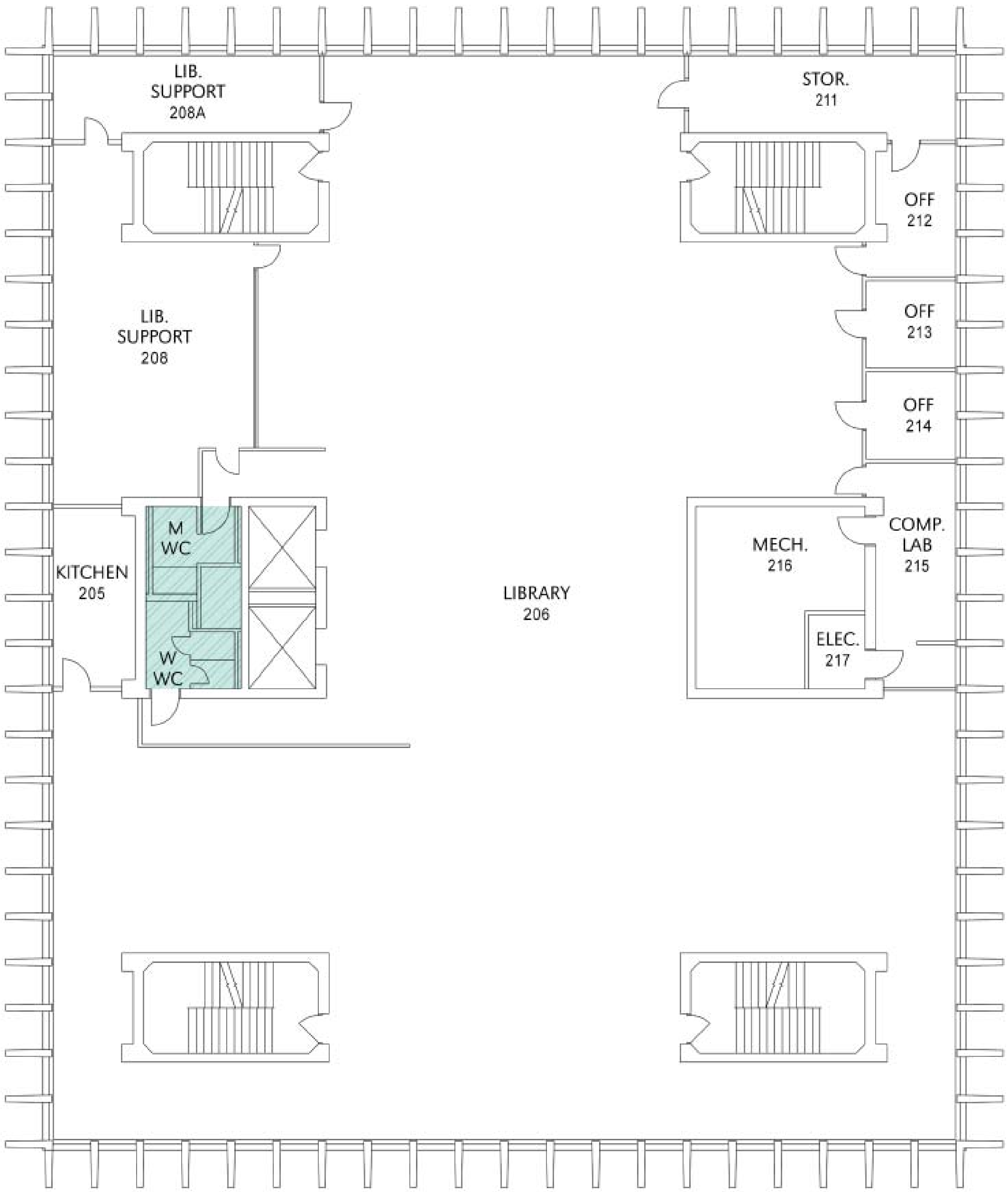
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

02 LEARNING RESOURCES/ LIBRARY



SECOND LEVEL

1" = 20'

Two code-compliant exits required

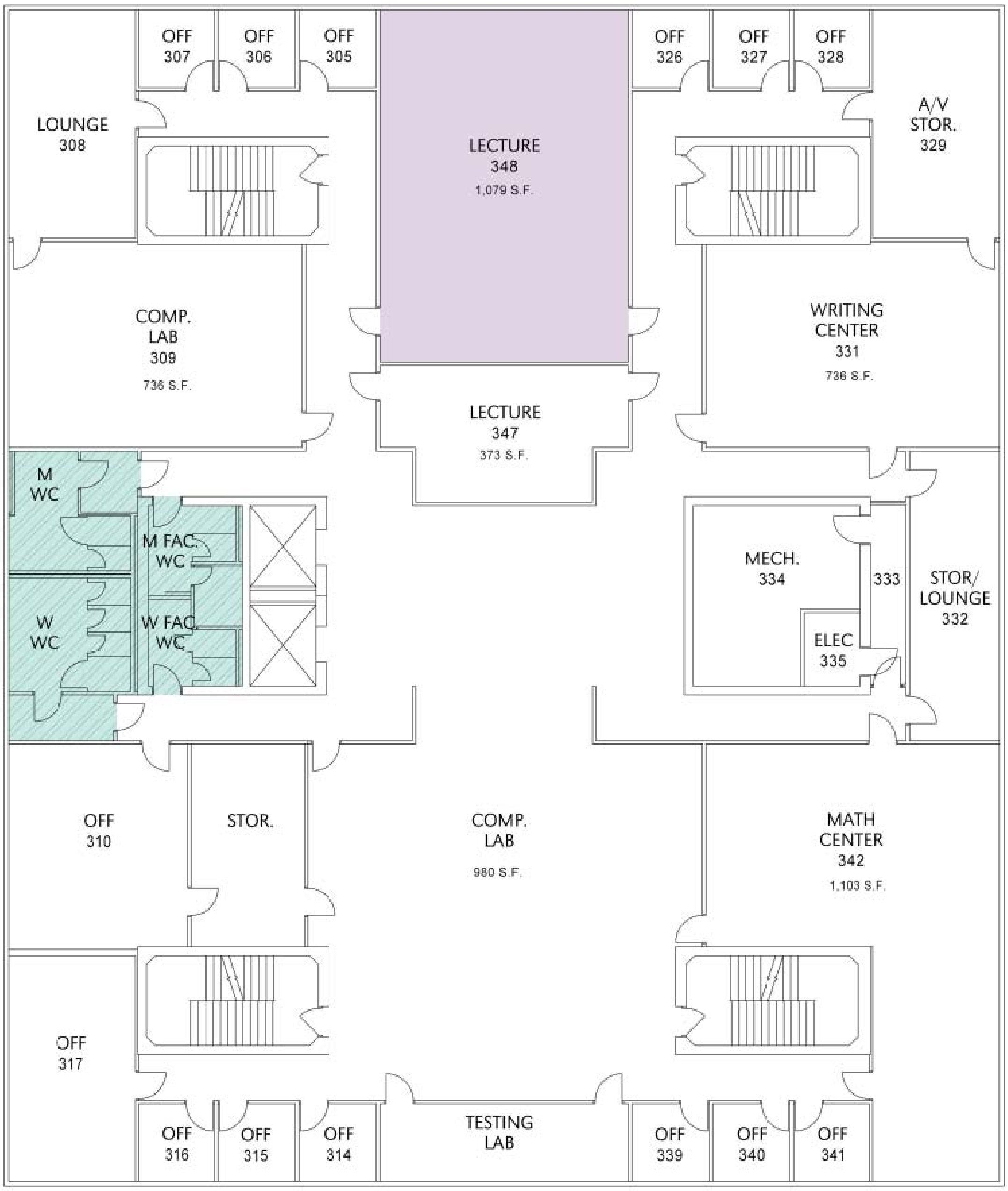
Inaccessible area (non-ADA)

Sprinklered area

More than one intervening room to exit

Non-compliant exit route

02 LEARNING RESOURCES/ LIBRARY



THIRD LEVEL

1" = 20'

Two code-compliant exits required

Inaccessible area (non-ADA)

Sprinklered area

More than one intervening room to exit

Non-compliant exit route

02 LEARNING RESOURCES/ LIBRARY

Lecture 347

Library support

Toilet facilities on third floor - Non-compliant door hardware.

Inaccessible drinking fountain

Fire & Life Safety

- No fire sprinklers at first and second levels and portions of third level.
- No smoke detectors.
- Exit corridor at basement used as storage area.
- No GFCI outlets throughout.

ADA

- Lack of compliant door hardware throughout.
- Many doors throughout do not have proper push/pull side clearances.
- Thresholds/walk-off mats at main entry and exit should be replaced due to tripping hazard.
- Non-compliant toilet rooms and fixtures.
- Non-compliant handrails and handrail extensions.
- Contrast warning striped must be added to top and bottom treads at stairs.
- Non-compliant drinking fountains.
- Non-compliant pay phones.
- Auto-door operator should be added to main library exit.

02 LEARNING RESOURCES/ LIBRARY

Replace old or worn items such as room divider.

Damage to wall base.

LRC/Library roof - Minor ponding at the library.

Maintenance

- Some acoustic ceiling tiles need to be replaced due to wear.
- Carpet at third floor classrooms needs to be replaced due to stains, gouges, or wear.
- Light levels in some classrooms are insufficient.
- Replace diffuser grills.
- Replace wall base where damaged/missing.
- Replace chair rails at classrooms.
- Existing roof is a built-up roofing system.
- Signs of minor ponding.
- No obvious signs of blistering or tearing.
- Minor delamination of the flexible flashing at the building perimeter.

02 LEARNING RESOURCES/ LIBRARY

Building Description

Site and Building Configuration

The site is generally flat where the building footprint occurs. The building, constructed in 1972, was one story high with a partial basement. Two levels were added in 1975, and the building now has 36,900 square feet and is three stories high. The second floor is approximately 20 feet high, the third floor is approximately 34 feet high, and the roof is approximately 47 feet high. The basement area is approximately 10 feet high.

Structural System

Structural plans were available for this building for both the original one story structure and the addition of two levels. The primary roof gravity system consists of concrete decks over the stairwells and elevator cores and a 30-foot by 80-foot area in the center of the building. The remaining roof area primary roof gravity system consists of concrete on metal deck spanning to steel beams, which span to concrete walls. The primary gravity system for the third floor, second floor and the area above the basement consists of a concrete deck spanning to concrete beams, which span to concrete walls. The foundation system consists of a combination of spread footings and continuous footings. Evidence of settlement was not observed.

The primary lateral system consists of concrete diaphragms spanning to exterior and interior concrete walls.

Overall Seismic Deficiencies and Expected Seismic Performance

The building does not have well distributed lateral load resisting concrete walls, does not appear to have adequate wall strength in the north south direction on the east side of the structure, and the concrete walls on the exterior of the third floor are essentially solid and much stronger than the second and first floor walls which means the structure has soft and weak stories. Therefore ESI recommends analysis of the lateral load resisting concrete walls to determine if they possess adequate strength to resist seismic loads. Included is figure 1 which shows the location of the proposed new wall. The length and location of the wall is shown for budgeting purposes only and will be revised based on future analysis. In a seismic event the windows and non-bearing gypboard walls would probably suffer typical damage in the form of broken glass and cracked gypboard walls. The ceiling would probably suffer typical damage in the form of cracked and displaced tiles.

02 LEARNING RESOURCES/ LIBRARY

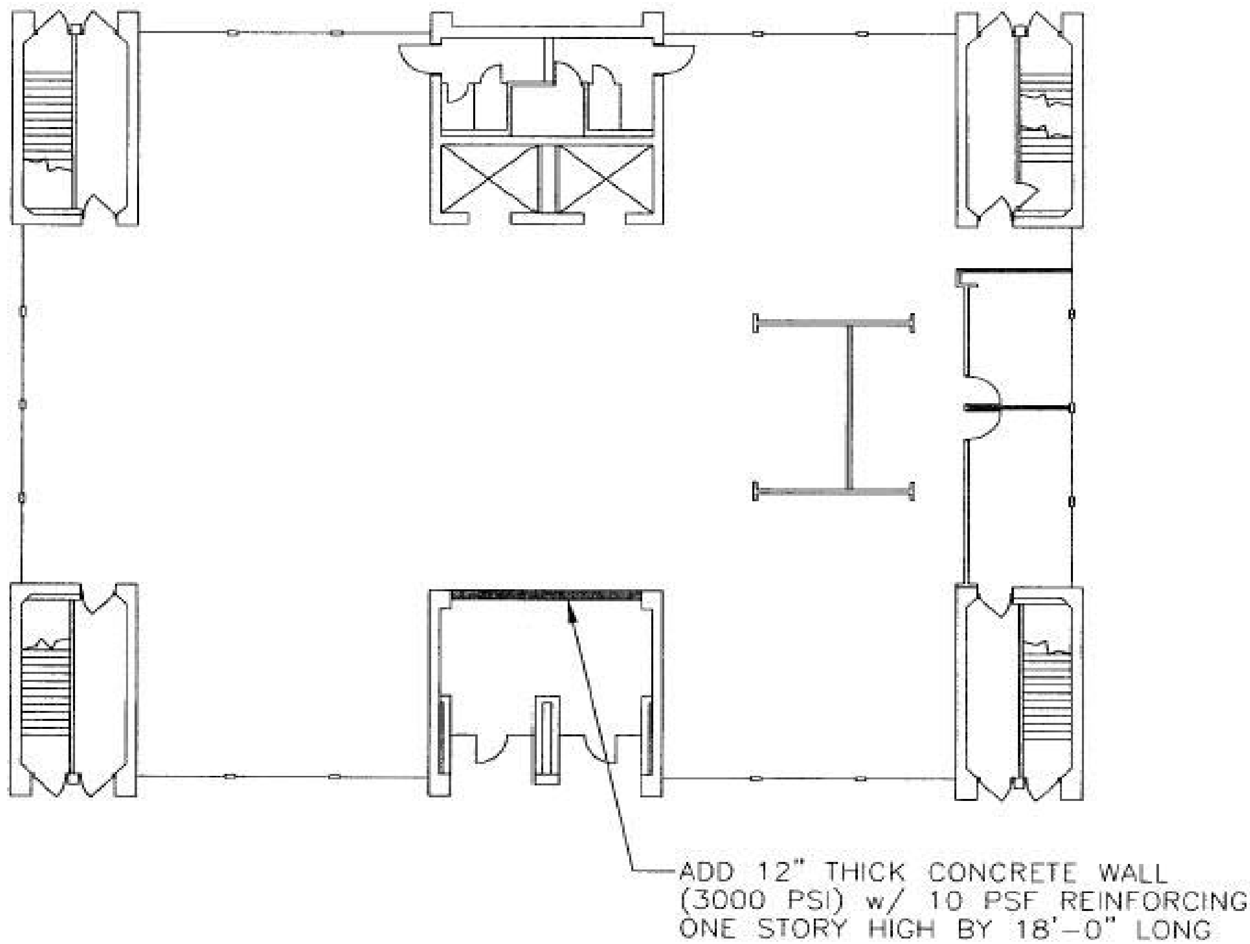


FIGURE 1. PROPOSED ADDITIONAL WALL LOCATION

02 LIBRARY

Figure 1 – Example of vibration isolators that are shot and need to be replaced.

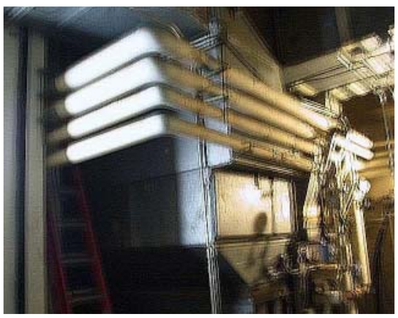


Figure 2 – Example of no seismic bracing on the piping or the duct work.

Figure 3 – Example of door gaskets that need to be replaced.

General Description

The Library was constructed in 1970 and consists of three floors and a basement. The main floor is served by a double deck constant volume multi-zone air handling unit and two constant volume single zone air handling units. The multi-zone unit is located in a mechanical room on the ground floor and the two single zone units are located in another mechanical room on the ground floor. The second floor is served by a double deck constant volume multi-zone air handling unit located in the mechanical room on the same floor. The third floor is served by two double deck constant volume multi-zone air handling units located in separate mechanical rooms on the third floor. All units receive the required heating hot and chilled water from the main campus boiler and chiller plants.

Deficiencies

General

- No insulation is provided for the walls and roof.
- Thermostats are mounted at heights noncompliant with the American's with Disabilities Act (ADA).
- No seismic bracing is provided for the piping and the ductwork.
- Toilets on the second floor have strong 'toilet' odor due to poor ventilation.

West Mechanical Room #114

Contains two single zone air handling units.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.
- No code required access is provided in front of the control panel mounted next to the ladder.

East Mechanical Room #115

Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

02 LIBRARY

Mechanical Room #216
Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Mechanical Room #322
Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Mechanical Room #334
Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Recommendations

- Replace the bearings on the fans.
- Replace the fans sheaves and belts.
- Refurbish the air handling units.
- Install P-traps on the condensate drains.
- Replace the vibration isolators on the air handling units.
- Replace the gaskets on the unit's doors.
- Replace the interior liners.
- Environmentally clean the air handling units and ductwork.
- Install seismic bracing on the piping.
- Install seismic bracing on the ductwork.
- Lower the height of the thermostats to ADA levels.
- Patch any test holes or leaks on the air handling units.

02 LIBRARY

General Description

- The Library building was constructed in 1970 as a one storey building with partial basement. In 1975 two more stories were added to the existing building.

Piping

- Domestic hot and cold water piping are galvanized steel. Some part of the piping in basement and first floor has been rusted out.
- There is no gas service in this building.
- Waste piping is service weight cast iron.

Fixtures

- Water closets are wall mounted flush tank. Units are in fair condition.
- Urinals are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Lavatories are wall mounted with newly furnished Geberit automatic faucets. Units are in fair condition.
- Floor drains do not have trap primer; therefore they do not comply with current code.
- Floor sinks in Mechanical room do not connect to trap primers; therefore they do not comply with the current code.
- Hose bibs in and outside of the building do not have vacuum breakers; therefore they do not comply with current code.

02 LIBRARY

Equipment

- There are (3) electric water heaters located in basement, second and third floors. The water heaters do not have expansion tank and earthquake straps; therefore they do not comply with current code. Units are in fair condition.
- A 2-gallon electric water heater is located below counter on second floor work room #205. The pressure & temperature relief valve drain is connected to tail piece of the sink. This connection does not comply with the code. Drain should run to approved receptor, i.e. floor sink or air gap fitting.
- A 4-gallon water heater is located below counter room #113. Unit is in fair condition.
- A duplex sump pump is located in the basement. Unit is in fair condition.

Fire Protection

- Building is covered by fire hose cabinets without hose, supplied via domestic water system.
- Basement is covered by a 3" fire main connect outside to domestic cold water main via OS&Y valve, check valve and flow switch. In addition Custodian room #1107 is covered by automatic fire sprinkler heads. The water supply is connected to (**Junior fire sprinkler system**) domestic water main inside the building via OS&Y valve, check valve and flow switch.

Utilities Load

- Domestic cold water: 186 FU = **82 GPM**
- Sewer: **173 Fixture Unit.**
- Natural Gas: none.

02 LIBRARY

Recommendations

- Re-pipe the whole building and replace all galvanized domestic hot and cold water piping with copper piping.
- Provide and install trap primers to all floor drains and floor sinks.
- Provide and install half or ¾ grating over all floor sinks.
- Provide new hose bibs to replace existing, or install vacuum breakers at all existing hose bibs.
- Provide and install appropriate size expansion thank at all domestic electric water heaters.
- Provide and install approved earthquake straps and bracings for all water heaters.
- Inspect all domestic water pressure reducing valves for proper operation.
- Inspect and test all backflow preventers by a certified agency for proper operation.
- Drain and clean all junior fire sprinkler systems. Test OS&Y valves, check valves and flow switches for proper operation.

02 LIBRARY

Figure 1 – Oil-filled fuse cut-outs for T-5

Figure 2 – Transformer T-5


Figure 3 – Distribution panel "DP-LBA"


Figure 4 – Panel boards

Power System Description

- Service to the complex consisted of high voltage feed at 4160V stepped down by several transformers to 120/208V, 3ø, 4-wire, 277/480V, 3ø, 4-wire and 480V, 3ø, 3-wire systems.
    - 300KVA transformer (T5) 4160-120/208V.
    - 300KVA transformer (T6A) 4160-277/480V.
    - 75KVA transformer (T6) 4160-480V.
    - 225A, 480V, 3ø, 3-wire distribution panel "DP-LBA".
    - 800A, 120/208V, 3ø, 4-wire distribution panel "DP-LBB".
    - 400A, 277/480V, 3ø, 4-wire distribution panel "DP-LBC".
- Power distribution for the building consisted of the following:
    - (9) Panel boards: LB-1, LB-2, LB-3, 2A, 2B, 2C, 3A, 3B and (1) 100A panel.
    - (3) Motor control centers (MCC): LB-P1, LB-P2 and LB-P3.
    - 37.5KVA transformer 480-120/208V

Lighting System

- Lighting fixtures are recently retrofitted with high efficiency fixtures by Siemens.
- General lighting consists of fluorescent fixtures with T-8 lamps.
- Exit lights are master/slave pair of overhead and low level exit fixtures with backup power.
- Most exit signs are illuminated.

Fire Alarm System

- Simplex Fire Alarm equipment are installed.
- Fire alarm pull stations are installed at exits.
- Fire alarm horns are installed at lobbies and corridors.
- Not ADA compliant.

02 LIBRARY

Recommendations

- The low voltage distribution equipment are discontinued models from Zinsco and no replacement parts are available. However, these existing equipment are still in good working condition and require regular inspection and maintenance.
- The oil-filled fuse cut-outs are discontinued models from G&W and no replacement parts are available. These equipment are in excess of their life expectancy. At this time, these equipment are still in good working condition and there is no immediate need of replacement. However, if any of the building will require renovations, replacement of all electrical equipment is strongly recommended.
- Periodic inspection of and, if necessary, torque adjustments of wire terminations at panel boards and distribution boards are recommended to eliminate possible loose connections.
- The power, lighting and life safety systems of this facility are adequate for its present requirements. Any future major additions or expansion would require a reassessment of its existing power, lighting and life safety infrastructure for adequacy.
- Exit signage should be reviewed for compliance.

02 LIBRARY

Figure 1 – View of Library building.

Building Identification (see figure 1)

No existing building identification is present for this building.

Option A Recommendation:

Provide new freestanding internally lit concrete sign to match existing signs on campus. Replace acrylic panel with painted aluminum panel with routed out copy so that just the copy illuminates.

Option B Recommendation:

Provide new sign system with freestanding and/or wall mounted signs. Use of a consistent sign color will enable signage to be easily recognized and stand out against building color and landscape.

- Freestanding: Provide new illuminated painted sign cabinet with larger routed illuminated building names and/or departments.

- Wall Mounted: Provide new sign panels or individual letters mounted to building face or low walls. Sign panels/copy size scaled to size of building.

ADA:

Provide sufficient accessibility information and directionals to navigate to an accessible entrance or path.

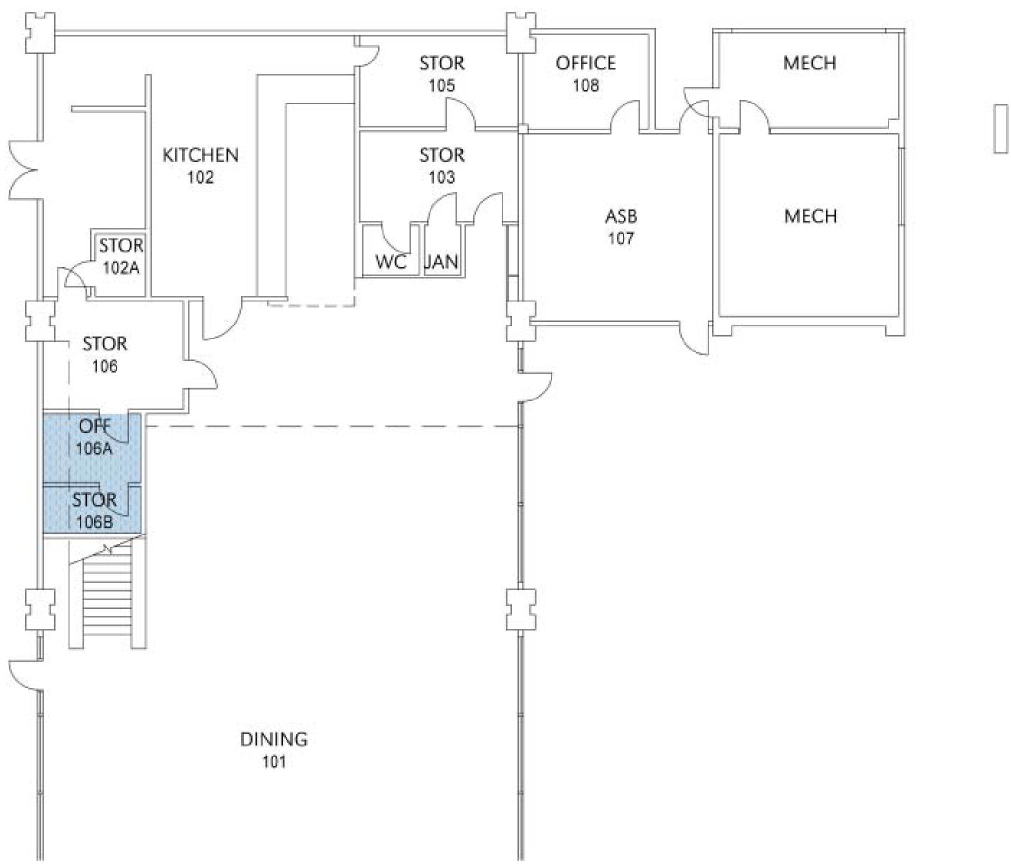
3 | COLLEGE CENTER

03 COLLEGE CENTER

SQUARE FOOTAGE:

	ASF	GSF
FIRST LEVEL	6,005	7,270
SECOND LEVEL	2,325	3,245
TOTAL	8,330	10,515

03 COLLEGE CENTER



FIRST LEVEL (1 of 2)

1" = 20'

Two code-compliant exits required

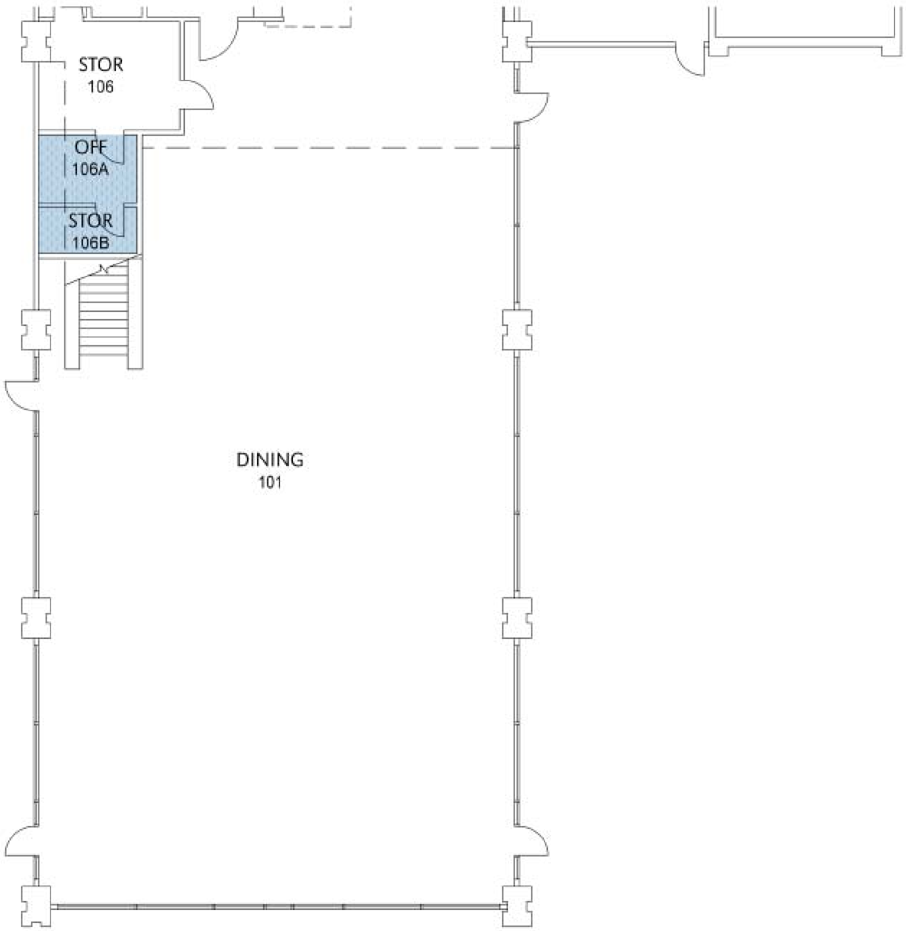
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

03 COLLEGE CENTER



FIRST LEVEL (2 of 2)

1" = 20'

Two code-compliant exits required

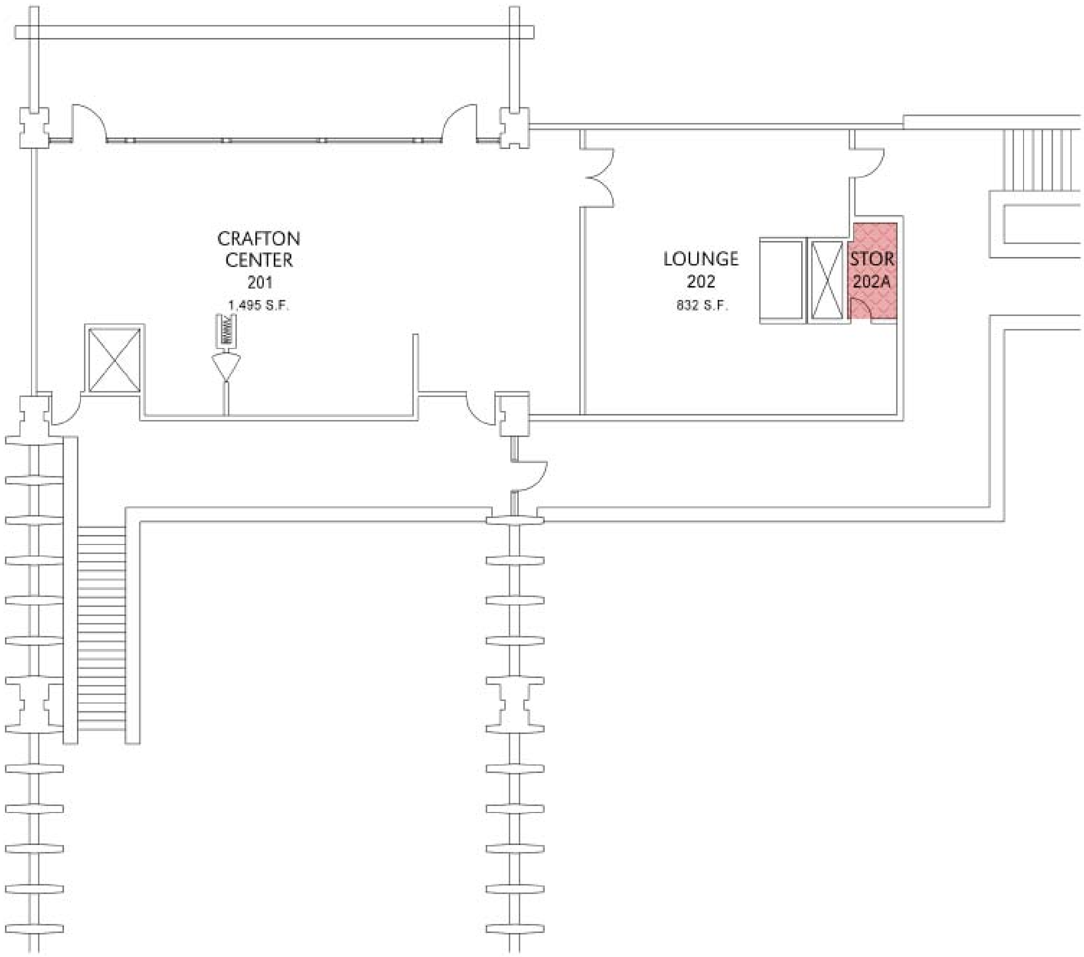
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

03 COLLEGE CENTER



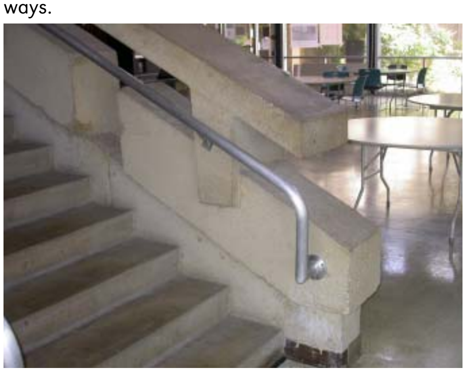
SECOND LEVEL

1" = 20'

Two code-compliant exits required	More than one intervening room to exit
Inaccessible area (non-ADA)	Non-compliant exit route
Sprinklered area	

03 COLLEGE CENTER

Kitchen - Lack of storage means bulky items are kept in pathways.



Stairs - Handrail extensions do not comply with code; top and bottom tread lack contrast warning strip.

Fire & Life Safety

- No fire sprinklers or smoke detectors.
- Exit signs are not properly located.
- Electrical panels are not located in closets.
- Bottom of mechanical shaft at first level is used for storage.
- No GFCI outlets throughout.
- Upgrades to panic hardware required.

ADA

- Some doors do not have proper push/pull side clearances.
- Non-compliant plumbing fixtures.
- Non-compliant handrails and handrail extensions.
- Contrast warning stripes must be added to top and bottom treads at stairs.

03 COLLEGE CENTER

Crafton Center - Carpet stain.

Crafton Center - Exposed electrical panel and floor drain.

Crafton Center - Exposed piping and floor drain.

Maintenance

- Replace adhered ceiling tiles.
- Carpet and VCT needs to be replaced due to stains, gouges, or wear.
- Replace diffuser grills.
- Replace wall base throughout.
- Replace closers on doors at first level.

03 COLLEGE CENTER

Building Description

Site and Building Configuration

The site is generally flat where the building footprint occurs. The building, constructed in 1972, has 8,560 square feet, and consists of a south wing, which does not have a second floor and the north end, which has a second floor. The north wing is two stories high with the second floor being approximately 12 feet high, and the roof being approximately 24 feet high. The south wing is one story high with the roof being approximately 24 feet high.

Structural System

Structural plans were available for this building. The primary gravity system for all levels consists of concrete decks spanning to concrete beams, which span to concrete walls or concrete columns. The foundation system consists of a combination of spread footings and continuous footings. Evidence of settlement was not observed.

The primary lateral system consists of concrete diaphragms spanning to exterior and interior concrete walls.

Overall Seismic Deficiencies and Expected Seismic Performance

At the south wing at the south end, only concrete columns act as lateral load resisting members. The columns appear to be inadequate to resist anticipated lateral loads. . ESI recommends analysis of the lateral load resisting concrete columns to determine if they possess adequate strength to resist seismic loads. Included is figure 1 which shows the location of a proposed new wall. The length and location of the wall is shown for budgeting purposes only and will be revised based on the future analysis. In a seismic event the windows and non-bearing gypboard walls would probably suffer typical damage in the form of broken glass and cracked gypboard walls. The ceiling would probably suffer typical damage in the form of cracked and displaced tiles.

03 COLLEGE CENTER

Figure 1 – Example of vibration isolators that are shot and need to be replaced.

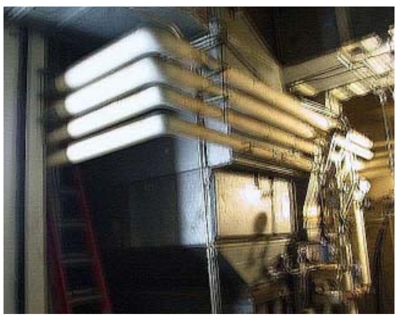


Figure 2 – Example of no seismic bracing on the piping or the duct work.

Figure 3 – Example of door gaskets that need to be replaced.

General Description

The College Center Building was constructed in 1970 and is a two story building. A double deck constant volume multi-zone air handling unit located in the mechanical room serves the building. The heating hot and chilled water for the unit are provided by a secondary boiler and chiller plant located in the Student Services A building. A fume hood is located on the first floor.

Deficiencies

General

- No insulation is provided for the walls and roof.
- Thermostats are mounted at heights noncompliant with the American's with Disabilities Act (ADA).
- No seismic bracing is provided for the piping and the ductwork.

Mechanical Room #125

Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Recommendations

- Replace the bearings on the fans.
- Replace the fans' sheaves and belts.
- Environmentally clean the air handling unit and ductwork.
- Refurbish the air handling unit.
- Install P-traps on the condensate drain.
- Replace the vibration isolators on the air handling unit.
- Replace the gaskets on the unit's doors.
- Replace the interior liner.
- Install seismic bracing on the piping.
- Install seismic bracing on the ductwork.
- Lower the height of the thermostats to ADA levels.
- Patch any test holes or leaks on the air handling unit.

03 STUDENT CTR/CAFETERIA ‘C’
04 STUDENT SERVICES ‘B’
05 CLASSROOM BUILDING ‘A’

Gas water heater

Gas water heater flue

Overhead piping

Student center

General Description

- The Student Center/Cafeteria buildings are consisting of building ‘A’, ‘B’, & ‘C’. They were constructed in 1970. Building ‘C’, Cafeteria portion tenant improvement took place thereafter.

Piping

- Domestic hot and cold water piping are galvanized steel including the Cafeteria piping. Some part of the piping has been rusted out, especially in central plant area level 2294 building ‘B’.
- Gas piping system is galvanized steel. Gas pressure regulator outside the building delivers gas at low pressure to the building. Gas piping is in fair condition.
- Waste piping is service weight cast iron.

Fixtures

- Water closets are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Urinals are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Lavatories are wall mounted with newly furnished Geberit automatic faucets. Units are in fair condition.
- Floor drains do not have trap primer; therefore they do not comply with current code.
- Floor sinks in equipment rooms building ‘B’ do not connect to trap primers, and the room is being used as outside air plenum; therefore they do not comply with the current code.
- Hose bibs in and outside of the building do not have vacuum breakers; therefore they do not comply with current code.
- Wall mounted electric water cooler and drinking fountain outside of toilet room building ‘B’ are in poor condition.

03 STUDENT CTR/CAFETERIA 'C'
04 STUDENT SERVICES 'B'
05 CLASSROOM BUILDING 'A'

Cafeteria second floor sink

A hose bibb without vacuum breaker, hose connects to hosebibb and drops into floor sink.

Equipment

- An electric water heater without expansion tank is located above ceiling of room A-107 services building 'A'.
- A central gas fired water heater is located in equipment room B-117 services building 'B'. The unit does not have expansion tank and earthquake straps; therefore it does not comply with current code. Unit is in poor condition.
- A gas water heater is located outside, north-west of building 'C' serving Cafeteria. Unit was installed in 1992 and is in fair condition.
- An electric water heater is located in Dressing room C-128 without expansion servicing Nurse's office.
- An electrical water heater is located under the sink on second in floor room C-230 without expansion tan

Fire Protection

- Closets and Custodian rooms building 'A' ,'B', 'C' and equipment room C-117 are covered by automatic fire sprinkler heads. The water supply is connected to (**Junior fire sprinkler system**) domestic water mains inside the building via OS&Y valves, check valves and flow switches.

Utilities Load

- Domestic cold water: 148 FU = **80 GPM**
- Sewer: **5 Fixture Units, building 'A'.**
  149 Fixture Units, building 'B'.
  21 Fixture Units, building 'C'.
- Natural Gas: 4" low pressure gas main via a gas pressure regulator.
- Building 'B' (2) space heating boilers each at 1500 CFH and water heater at 155 CFH.
- Building 'C' water heater at 200 CFH and cooking equipment at 2500 CFH.
- **Total natural gas load 5,855 CFH.**

03 STUDENT CTR/CAFETERIA ‘C’
04 STUDENT SERVICES ‘B’
05 CLASSROOM BUILDING ‘A’

Recommendations

- Re-pipe the whole building complex and replace all galvanized domestic hot and cold water piping with copper piping.
- Provide and install trap primers to all floor drains and floor sinks.
- Provide and install half or ¾ grating over all floor sinks.
- Provide new hose bibs to replace existing, or install vacuum breakers at all existing hose bibs.
- Provide and install appropriate size expansion thank at all domestic gas or electric water heaters.
- Provide and install approved earthquake straps and bracings for all water heaters and circulating pumps.
- Replace gas water heater in equipment room B-117 services building ‘B’ with a new unit to match existing.
- Provide and install gas earthquake valve upstream of the existing pressure regulator.
- Install a grease interceptor and divert all kitchen grease waste to the interceptor prior connecting to the site sewer.
- Inspect all domestic water pressure reducing valves for proper operation.
- Inspect and test all backflow preventers by a certified agency for proper operation.
- Drain and clean all junior fire sprinkler systems. Test OS&Y valves, check valves and flow switches for proper operation.

03 COLLEGE CENTER

Figure 1 – Distribution panel

Figure 2 – Panel with time clock

Figure 3 – Simplex fire alarm equipments

Power System Description

- Service to the complex consisted of high voltage feed at 4160V stepped down by several transformers to 120/208V, 3ø, 4-wire and 480V, 3ø, 3-wire systems.
  - 30KVA transformer (T-1) 4160-480V with 12A oil-filled fuse cut-outs.
  - 225KVA transformer (T-2) 4160-120/208V with 65A oil-filled fuse cut-outs.
  - 100A, 480V, 3ø, 3-wire distribution panel “DP-DA”.
  - 600A, 120/208V, 3ø, 4-wire distribution panel “DP-DB”.
- Power distribution for the building consisted of the following:
  - (3) Panel boards: K1, K2 and K3.
  - (1) Motor control center (MCC): AP-4

Lighting System

- Lighting fixtures are recently retrofitted with high efficiency fixtures by Siemens.
- General lighting consists of fluorescent fixtures with T-8 lamps.
- Exit lights are master/slave pair of overhead and low level exit fixtures with backup power.
- Most exit signs are illuminated.

Fire Alarm System

- Simplex Fire Alarm equipment are installed.
- Fire alarm pull stations are installed at exits.
- Fire alarm horns are installed at lobbies and corridors.
- Not ADA compliant.

03 COLLEGE CENTER

Recommendations

- The low voltage distribution equipment are discontinued models from Zinsco and no replacement parts are available. However, these existing equipment are still in good working condition and require regular inspection and maintenance.
- The oil-filled fuse cut-outs are discontinued models from G&W and no replacement parts are available. These equipment are in excess of their life expectancy. At this time, these equipment are still in good working condition and there is no immediate need of replacement. However, if any of the building will require renovations, replacement of all electrical equipment is strongly recommended.
- Periodic inspection of and, if necessary, torque adjustments of wire terminations at panel boards and distribution boards are recommended to eliminate possible loose connections.
- The power, lighting and life safety systems of this facility are adequate for its present requirements. Any future major additions or expansion would require a reassessment of its existing power, lighting and life safety infrastructure for adequacy.
- Exit signage should be reviewed for compliance.

03 COLLEGE CENTER

Figure 1 – View of Student Center/Cafeteria building.

Building Identification (see figure 1)

Existing freestanding illuminated concrete sign is showing signs of decay. Scale of the sign and its copy is too small for larger buildings. Concrete sign is not visible as it blends with concrete architecture. Illuminated sign panel is too small to identify buildings with several names, uses or departments. Exposed screws are visible in sign face. Illuminated faces do not provide the best copy visibility.

Existing wall mounted signs have exposed fasteners thru face.

Option A Recommendation:

Repair concrete and sandblast to clean. Retrofit lamping and wiring. Replace acrylic panel with painted aluminum panel with routed out copy so that just the copy illuminates.

Option B Recommendation:

Provide new sign system with freestanding and/or wall mounted signs. Use of a consistent sign color will enable signage to be easily recognized and stand out against building color and landscape.

- Freestanding: Provide new illuminated painted sign cabinet with larger routed illuminated building names and/or departments.
- Wall Mounted: Provide new sign panels or individual letters mounted to building face or low walls. Sign panels/copy size scaled to size of building.

ADA:

Provide sufficient accessibility information and directionals to navigate to an accessible entrance or path.

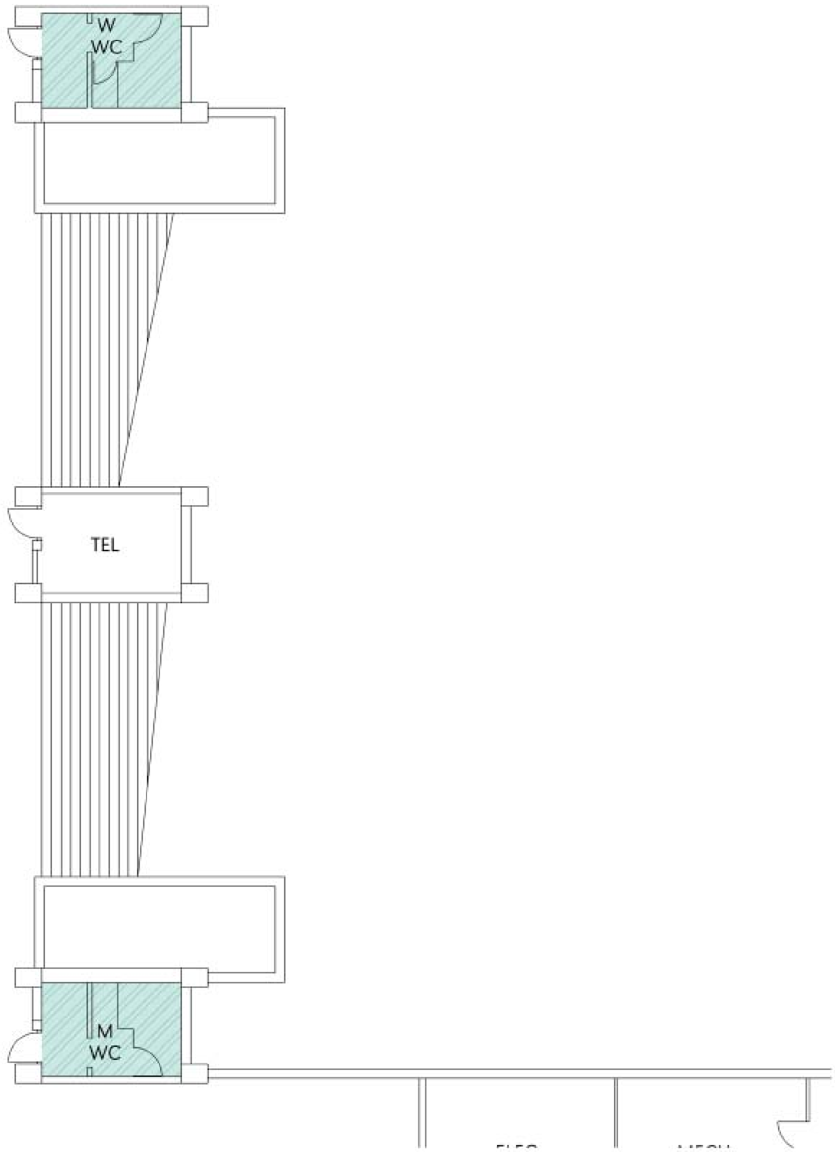
4 | STUDENT SERVICES A

04 STUDENT SERVICES A

SQUARE FOOTAGE:

	ASF	GSF
FIRST LEVEL		2,625
SECOND LEVEL	1,375	2,505
THIRD LEVEL	3,415	5,725
TOTAL	4,790	10,855

04 STUDENT SERVICES A



FIRST LEVEL (1 of 2)

1" = 20'

Two code-compliant exits required

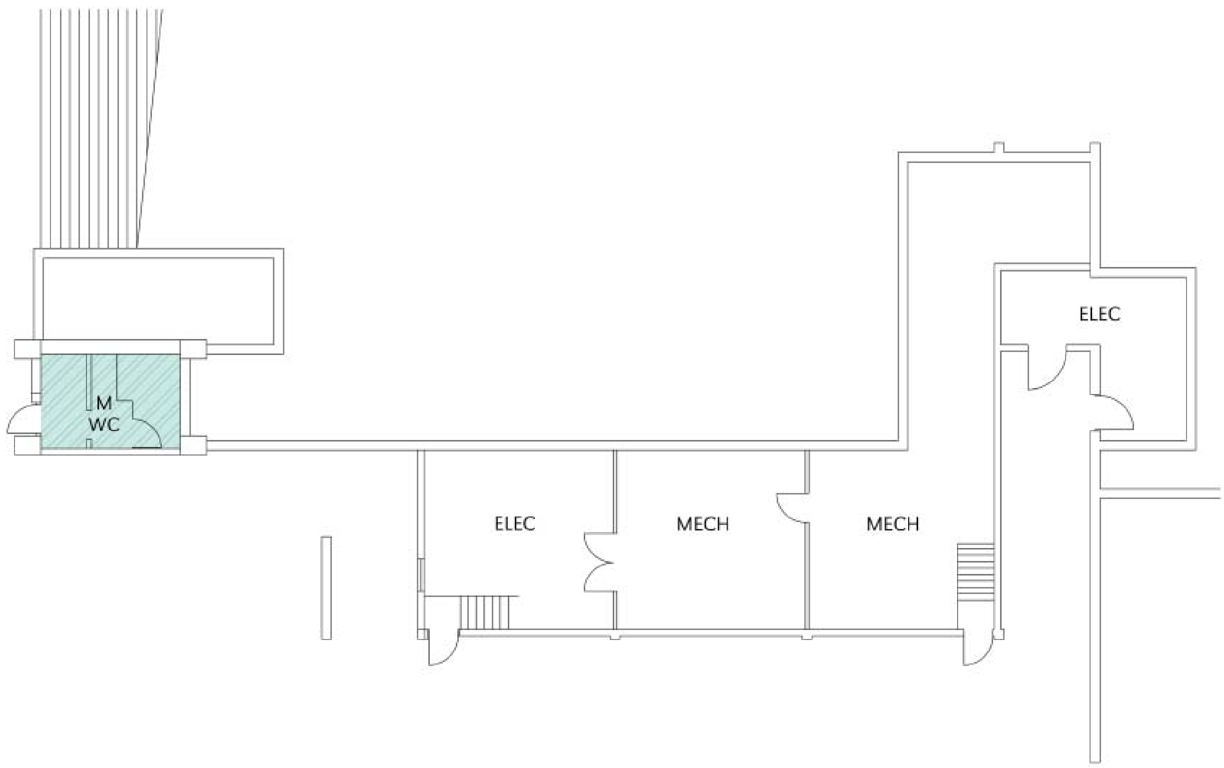
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

04 STUDENT SERVICES A



FIRST LEVEL (2 of 2)

1" = 20'

Two code-compliant exits required

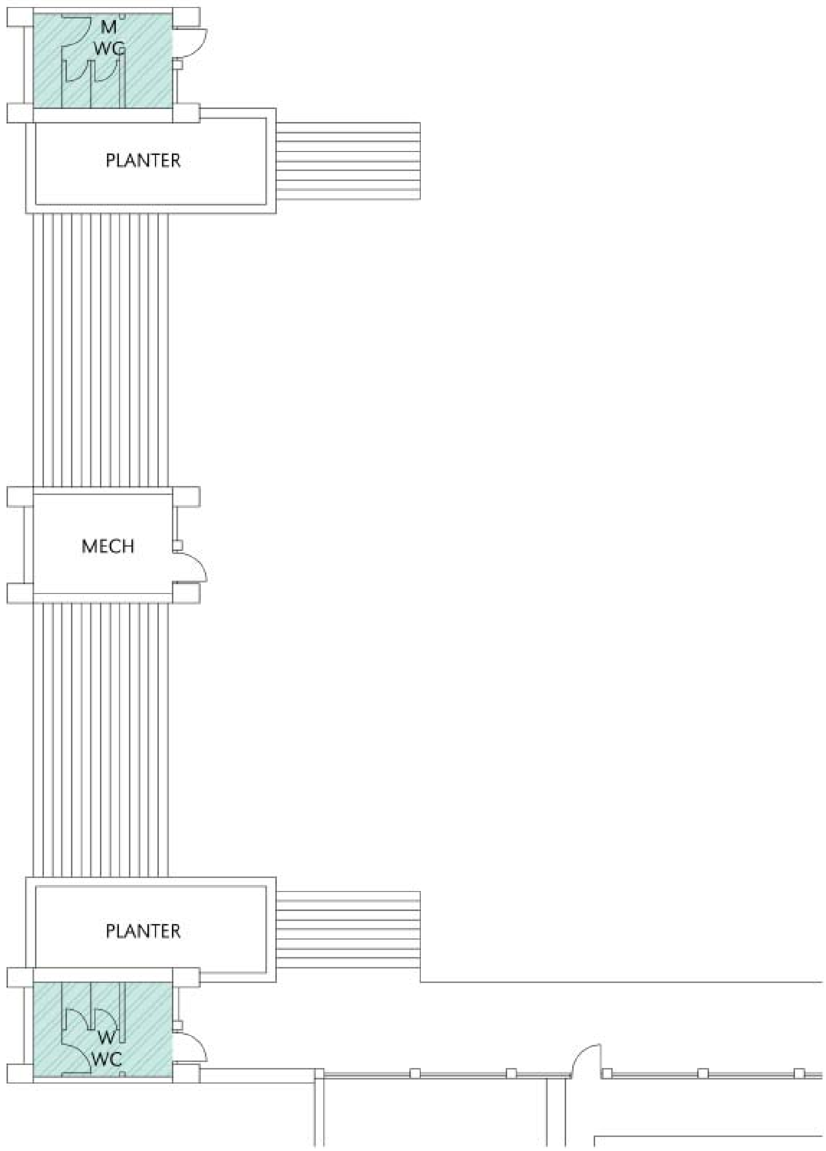
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

04 STUDENT SERVICES A



SECOND LEVEL (1 of 2)

1" = 20'

Two code-compliant exits required

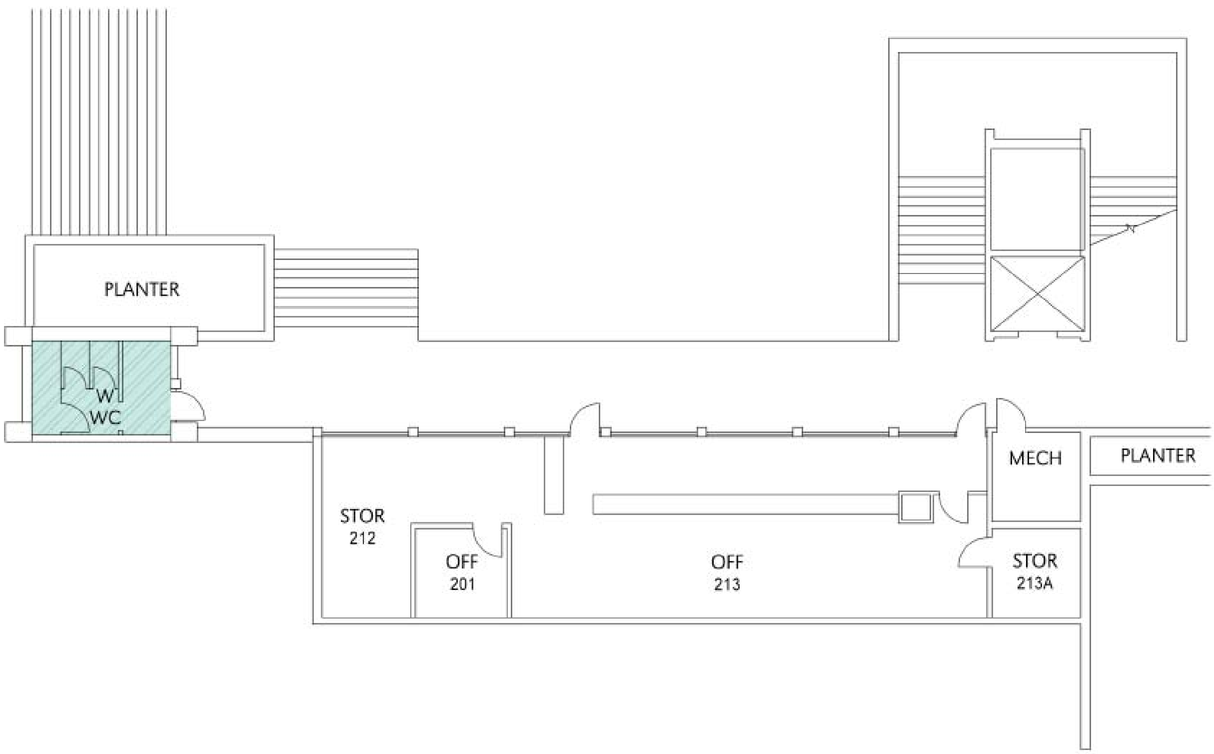
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

04 STUDENT SERVICES A



SECOND LEVEL (2 of 2)

1" = 20'

Two code-compliant exits required

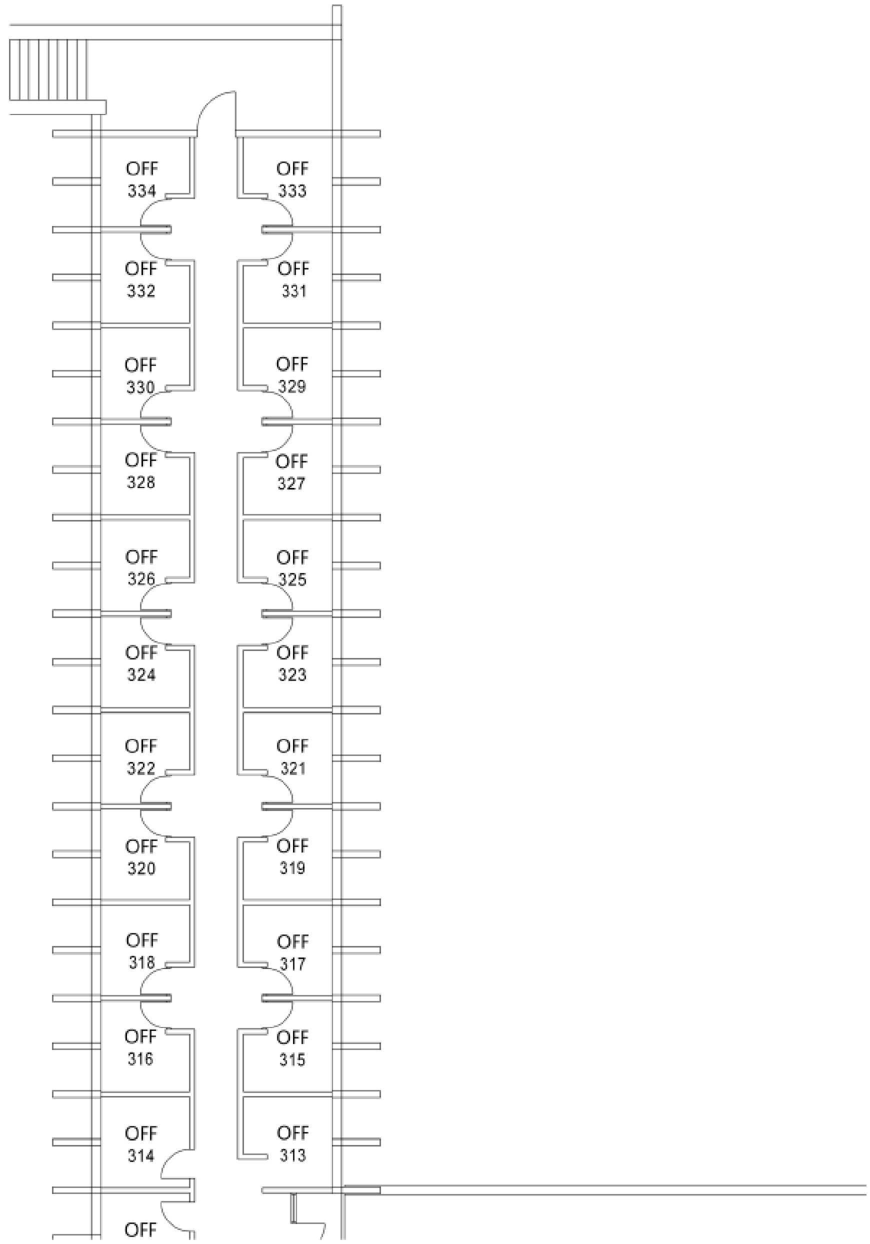
More than one intervening room to exit

Inaccessible area (non-ADA)

Non-compliant exit route

Sprinklered area

04 STUDENT SERVICES A

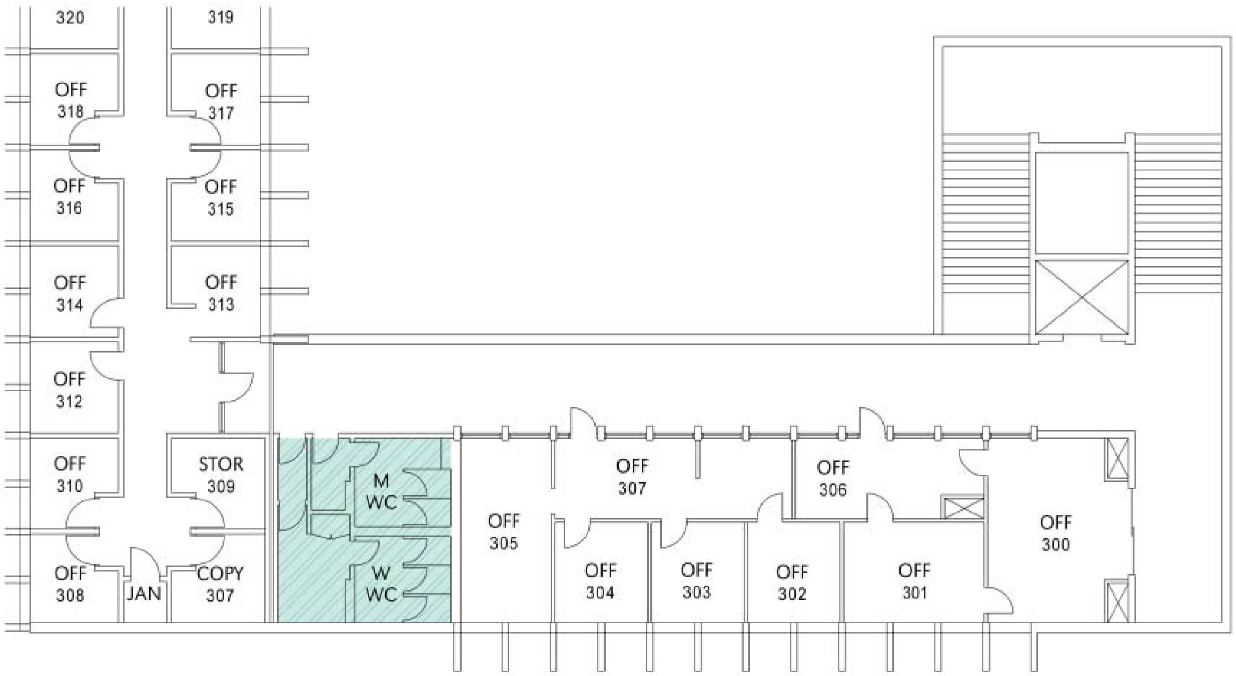


THIRD LEVEL (1 of 2)

1” = 20’

- Two code-compliant exits required
- More than one intervening room to exit
- Inaccessible area (non-ADA)
- Non-compliant exit route
- Sprinklered area

04 STUDENT SERVICES A



THIRD LEVEL (2 of 2)

1" = 20'

Two code-compliant exits required

Inaccessible area (non-ADA)

Sprinklered area

More than one intervening room to exit

Non-compliant exit route

04 STUDENT SERVICES A

Hallway - Exposed and unlocked electrical panels.

Office - Electrical outlet not mounted or secured.

Exterior stair - No handrail.

Student Services A roof - Signs of ponding.

Fire & Life Safety

- No fire sprinklers or smoke detectors.
- Lack of illuminated exit signs.
- Electrical panels are not located in closets.
- No GFCI outlets throughout.
- Upgrades to panic hardware required.

ADA

- Many doors throughout do not have proper push/pull side clearances.
- Lack of compliant door hardware throughout.
- Non-compliant toilet rooms and fixtures.
- Non-compliant handrails and handrail extensions; lack of handrails at some exterior stairs.
- Contrast warning stripes must be added to treads at exterior stairs.

Maintenance

- Replace acoustic and adhered ceiling tiles due to wear.
- Carpet and VCT needs to be replaced due to stains, gouges, or wear.
- Replace diffuser grills.
- Replace wall base throughout.
- Replace closers on doors.
- Existing roof is a built-up roofing system.
- Signs of ponding.
- Blisterings occurs at several locations.
- Building up roofing is dry and cracked.
- Perimeter flashing seems to be in good condition
- Drains need to be cleared
- Flexible flashing at building joint has tears and is delaminating.

04 STUDENT SERVICES A

Building Description

Site and Building Configuration

The site slopes down in the south direction from the second level to the first level at the south wing and slopes down in the west direction from the second level to the first level where the west wing occurs. The building, constructed in 1972, has 9,970 square feet, and consists of a south wing seismically separated from the west wing at the roof and second floor. The south wing is three stories high with the second floor being approximately 12 feet high, the third floor being approximately 24 feet high, and the roof being approximately 36 feet high. There is a clock tower on the east end on the north side of this wing, which is approximately 60 feet high. The west wing is two stories high with the second floor being approximately 24 feet high and the roof being approximately 36 feet high. There is a bridge between the student services building and the student center, which occurs on the north end on the west side of this wing. The bridge is seismically separated from the student center.

Structural System

Structural plans were available for this building. The primary gravity system for all levels consists of concrete decks spanning to concrete beams, which span to concrete walls. The foundation system consists of a combination of spread footings and continuous footings. Evidence of settlement was not observed.

The primary lateral system consists of concrete diaphragms spanning to exterior and interior concrete walls.

Overall Seismic Deficiencies and Expected Seismic Performance

The south wing has lateral load resisting walls from the height of 24 feet to 36 feet, which occur at the southeast corner, which are not continuous to the ground. The west wing at the same level has lateral load resisting walls on the north and south ends which are not continuous to the ground. Also, north south lateral load resisting walls of the first floor of the west wing appear to be inadequate. Therefore ESI recommends analysis of the lateral load resisting concrete walls to determine if they possess adequate strength to resist seismic loads. Included is figure 1 which shows the location of proposed new walls. The length and location of the walls is shown for budgeting purposes only and will be revised based on the future analysis. In a seismic event the windows and non-bearing gypboard walls would probably suffer typical damage in the form of

04 STUDENT SERVICES A

broken glass and cracked gypboard walls. The ceiling would probably suffer typical damage in the form of cracked and displaced tiles.

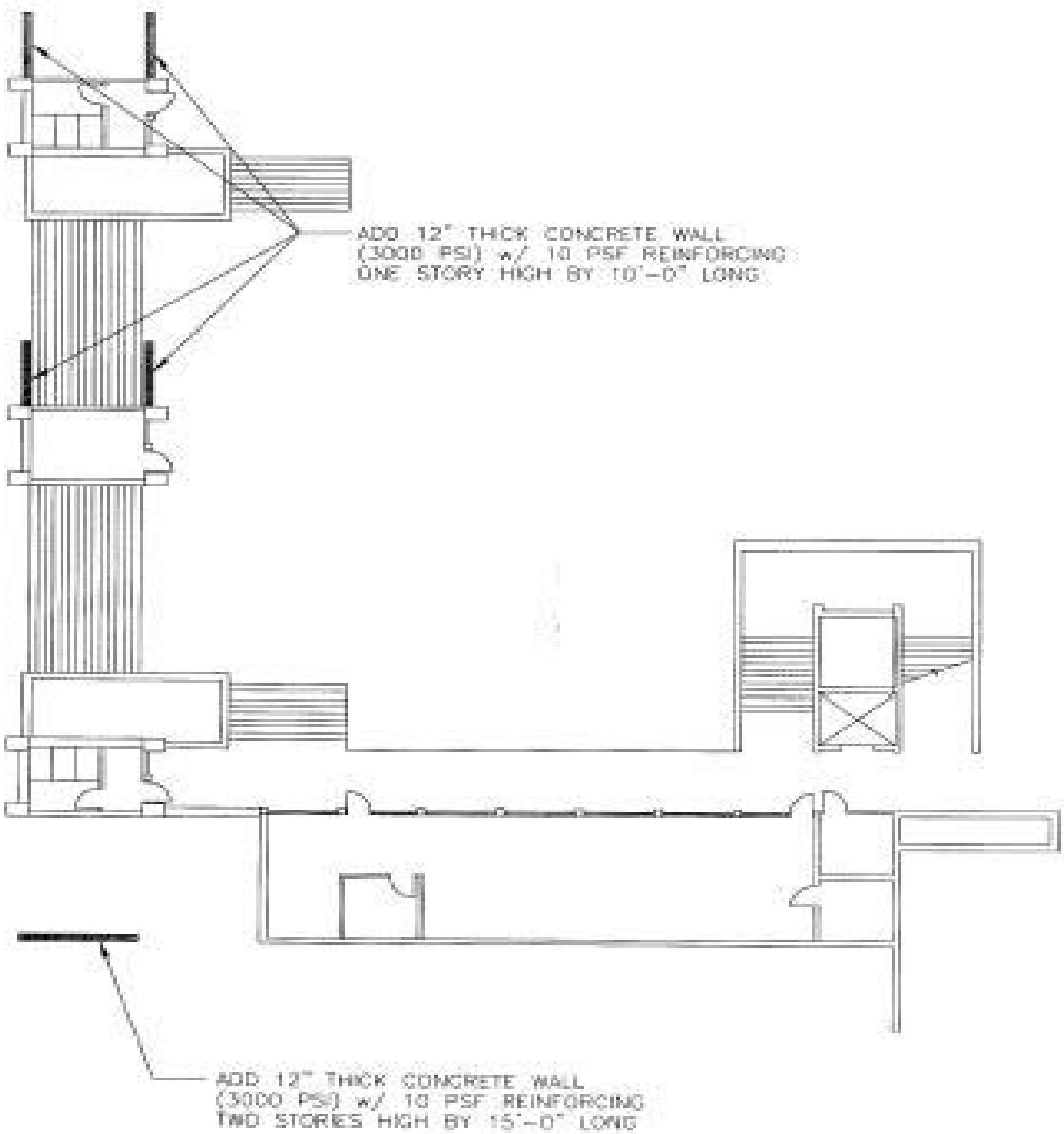


FIGURE 1. PROPOSED ADDITIONAL WALL LOCATION

04 STUDENT SERVICES A

Figure 1 – Example of vibration isolators that are shot and need to be replaced.

Figure 2 – Example of no seismic bracing on the piping or the duct work.

Figure 3 – Example of door gaskets that need to be replaced.

General Description

The student services A building is a two story building and was constructed in 1970. The building contains the secondary campus chiller/boiler plant, located on the first floor. Two constant volume single zone units serve the building. Reheat coils are installed in the supply air duct branches serving each individual office. The air handling units receive the required heating hot and chilled water from the secondary boiler and chiller plants.

Deficiencies

General

- No insulation is provided for the walls and roof.
- Thermostats are mounted at heights noncompliant with the American's with Disabilities Act (ADA).
- No seismic bracing is provided for the piping and the ductwork.

Mechanical Room #211

Contains one single zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Mechanical Room #226

Contains one single zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

Secondary Central Plant

- Pumps have no flexible connection.
- Expansion tank has no seismic bracing.
- No seismic bracing on piping and ductwork.
- According to the maintenance building supervisor the underground chilled and heating hot water distribution system has developed numerous leaks and has severely deteriorated. This causes frequent system shutdown for maintenance.

04 STUDENT SERVICES A

Recommendations

- Install flexible connections on the pumps.
- Install seismic bracing on the expansion tank.
- Replace the bearings on the fans.
- Replace the fans' sheaves and belts.
- Environmentally clean the air handling units and ductwork.
- Refurbish the air handling units.
- Install P-traps on condensate drains.
- Replace vibration isolators on the air handling units.
- Replace the gaskets on the unit's doors.
- Replace the interior liner.
- Lower the height of the thermostats to ADA levels.
- Install seismic bracing on the piping.
- Install seismic bracing on the ductwork.
- Patch any test holes or leaks on the air handling units.
- Replace existing underground chilled and heating hot water distribution systems.

03 STUDENT CTR/CAFETERIA 'C'
04 STUDENT SERVICES 'B'
05 CLASSROOM BUILDING 'A'


Gas water heater


Gas water heater flue


Overhead piping


Student center

General Description

- The Student Center/Cafeteria buildings are consisting of building 'A', 'B', & 'C'. They were constructed in 1970. Building 'C', Cafeteria portion tenant improvement took place thereafter.

Piping

- Domestic hot and cold water piping are galvanized steel including the Cafeteria piping. Some part of the piping has been rusted out, especially in central plant area level 2294 building 'B'.
- Gas piping system is galvanized steel. Gas pressure regulator outside the building delivers gas at low pressure to the building. Gas piping is in fair condition.
- Waste piping is service weight cast iron.

Fixtures

- Water closets are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Urinals are wall mounted flush valve with new Geberit automatic flush valves. Units are in fair condition.
- Lavatories are wall mounted with newly furnished Geberit automatic faucets. Units are in fair condition.
- Floor drains do not have trap primer; therefore they do not comply with current code.
- Floor sinks in equipment rooms building 'B' do not connect to trap primers, and the room is being used as outside air plenum; therefore they do not comply with the current code.
- Hose bibs in and outside of the building do not have vacuum breakers; therefore they do not comply with current code.
- Wall mounted electric water cooler and drinking fountain outside of toilet room building 'B' are in poor condition.

03 STUDENT CTR/CAFETERIA 'C'
04 STUDENT SERVICES 'B'
05 CLASSROOM BUILDING 'A'

Cafeteria second floor sink

A hose bibb without vacuum breaker, hose connects to hosebibb and drops into floor sink.

Equipment

- An electric water heater without expansion tank is located above ceiling of room A-107 services building 'A'.
- A central gas fired water heater is located in equipment room B-117 services building 'B'. The unit does not have expansion tank and earthquake straps; therefore it does not comply with current code. Unit is in poor condition.
- A gas water heater is located outside, north-west of building 'C' serving Cafeteria. Unit was installed in 1992 and is in fair condition.
- An electric water heater is located in Dressing room C-128 without expansion servicing Nurse's office.
- An electrical water heater is located under the sink on second in floor room C-230 without expansion tan

Fire Protection

- Closets and Custodian rooms building 'A' ,'B', 'C' and equipment room C-117 are covered by automatic fire sprinkler heads. The water supply is connected to (**Junior fire sprinkler system**) domestic water mains inside the building via OS&Y valves, check valves and flow switches.

Utilities Load

- Domestic cold water: 148 FU = **80 GPM**
- Sewer: **5 Fixture Units, building 'A'.**
  149 Fixture Units, building 'B'.
  21 Fixture Units, building 'C'.
- Natural Gas: 4" low pressure gas main via a gas pressure regulator.
- Building 'B' (2) space heating boilers each at 1500 CFH and water heater at 155 CFH.
- Building 'C' water heater at 200 CFH and cooking equipment at 2500 CFH.
- **Total natural gas load 5,855 CFH.**

03 STUDENT CTR/CAFETERIA 'C'
04 STUDENT SERVICES 'B'
05 CLASSROOM BUILDING 'A'

Recommendations

- Re-pipe the whole building complex and replace all galvanized domestic hot and cold water piping with copper piping.
- Provide and install trap primers to all floor drains and floor sinks.
- Provide and install half or ¾ grating over all floor sinks.
- Provide new hose bibs to replace existing, or install vacuum breakers at all existing hose bibs.
- Provide and install appropriate size expansion thank at all domestic gas or electric water heaters.
- Provide and install approved earthquake straps and bracings for all water heaters and circulating pumps.
- Replace gas water heater in equipment room B-117 services building 'B' with a new unit to match existing.
- Provide and install gas earthquake valve upstream of the existing pressure regulator.
- Install a grease interceptor and divert all kitchen grease waste to the interceptor prior connecting to the site sewer.
- Inspect all domestic water pressure reducing valves for proper operation.
- Inspect and test all backflow preventers by a certified agency for proper operation.
- Drain and clean all junior fire sprinkler systems. Test OS&Y valves, check valves and flow switches for proper operation.

04 STUDENT SERVICES A

Figure 1 – Switchboard

Figure 2 – Motor control center

Figure 3 – Oil-filled fuse cutouts

Figure 4 – Panel board A2-1

Power System Description

- Service to the complex consisted of high voltage feed at 4160V stepped down by several transformers to 120/208V, 3ø, 4-wire and 277/480V, 3ø, 4-wire systems.
    - 300KVA transformer (T-3) 4160-277/480V with 100A oil-filled fuse cut-outs.
    - 300KVA transformer (T-4) 4160-120/208V with 100A oil-filled fuse cut-outs.
    - 400A, 480V, 3ø, 3-wire distribution panel “CA”.
    - 800A, 120/208V, 3ø, 4-wire distribution panel “CB”.
- Power distribution for the building consisted of the following:
    - (5) Panel boards: A1-1, A1-2, A2-1, A3-1 and A3-2.
    - (4) Motor control center (MCC): ABP, ACP, AP-2 and AP-3.

Lighting System

- Lighting fixtures are recently retrofitted with high efficiency fixtures by Siemens.
- General lighting consists of fluorescent fixtures with T-8 lamps.
- Exit lights are master/slave pair of overhead and low level exit fixtures with backup power.
- Exit signage is deficient. Most exit signs are illuminated.

Fire Alarm System

- Simplex Fire Alarm equipment are installed.
- Fire alarm pull stations are installed at exits.
- Fire alarm horns are installed at lobbies and corridors.
- Not ADA compliant.

04 STUDENT SERVICES A

Figure 5 – Telecom room

Recommendations

- The low voltage distribution equipment are discontinued models from Zinsco and no replacement parts are available. However, these existing equipment are still in good working condition and require regular inspection and maintenance.
- The oil-filled fuse cut-outs are discontinued models from G&W and no replacement parts are available. These equipment are in excess of their life expectancy. At this time, these equipment are still in good working condition and there is no immediate need of replacement. However, if any of the building will require renovations, replacement of all electrical equipment is strongly recommended.
- Periodic inspection of and, if necessary, torque adjustments of wire terminations at panel boards and distribution boards are recommended to eliminate possible loose connections.
- The power, lighting and life safety systems of this facility are adequate for its present requirements. Any future major additions or expansion would require a reassessment of its existing power, lighting and life safety infrastructure for adequacy.
- Exit signage should be reviewed for compliance.

04 STUDENT SERVICES A

Figure 1 – View of freestanding building identification sign.

Figure 2 – View of wall mounted and suspended department identification signs.

Building Identification (see figures 1 & 2)

Existing freestanding illuminated concrete sign is showing signs of decay. Scale of the sign and its copy is too small for larger buildings. Concrete sign is not visible as it blends with concrete architecture. Illuminated sign panel is too small to identify buildings with several names, uses or departments. Exposed screws are visible in sign face. Illuminated faces do not provide the best copy visibility.

Existing wall mounted signs have exposed fasteners thru face.

Option A Recommendation:

Repair concrete and sandblast to clean. Retrofit lamping and wiring. Replace acrylic panel with painted aluminum panel with routed out copy so that just the copy illuminates.

Option B Recommendation:

Provide new sign system with freestanding and/or wall mounted signs. Use of a consistent sign color will enable signage to be easily recognized and stand out against building color and landscape.

- Freestanding: Provide new illuminated painted sign cabinet with larger routed illuminated building names and/or departments.
- Wall Mounted: Provide new sign panels or individual letters mounted to building face or low walls. Sign panels/copy size scaled to size of building.

ADA:

Provide sufficient accessibility information and directionals to navigate to an accessible entrance or path.

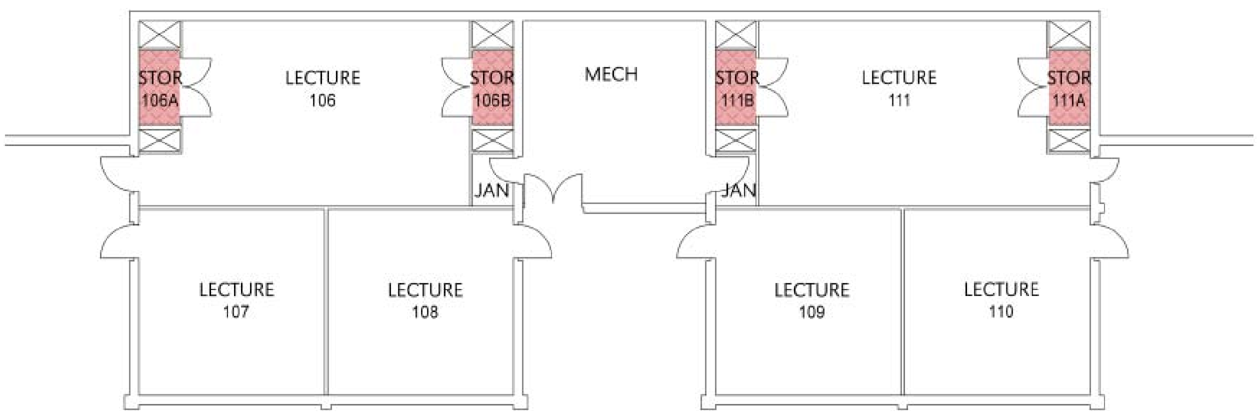
5 | CLASSROOM BUILDING

05 CLASSROOM BUILDING

SQUARE FOOTAGE:

	ASF	GSF
FIRST LEVEL	2,835	3,755
SECOND LEVEL	2,875	3,355
TOTAL	5,710	7,110

05 CLASSROOM BUILDING



FIRST LEVEL

1" = 20'

Two code-compliant exits required

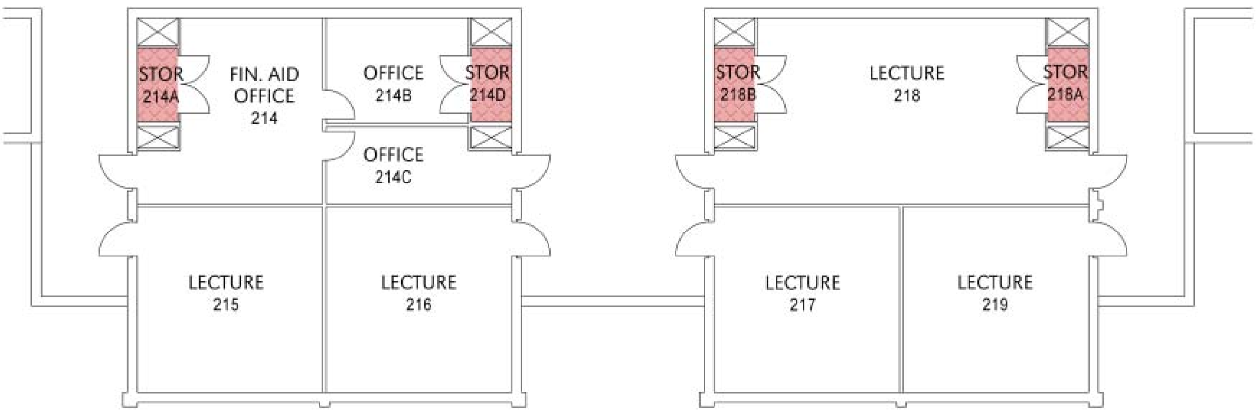
Inaccessible area (non-ADA)

Sprinklered area

More than one intervening room to exit

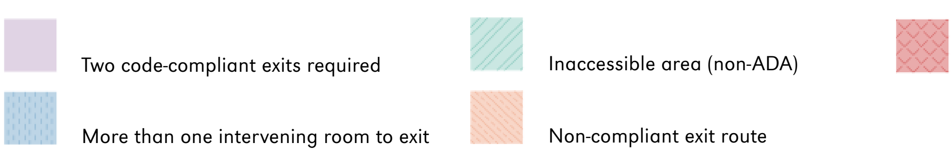
Non-compliant exit route

05 CLASSROOM BUILDING



SECOND LEVEL

1" = 20'



05 CLASSROOM BUILDING

Lecture 216 - Typical classroom.

Fire & Life Safety

- No fire sprinklers only located in storage closets.
- No smoke detectors.
- Lack of illuminated exit signs and/or exit signs missing from some areas.
- No GFCI outlets throughout.
- Addition of panic hardware required.
- Exposed electrical and data conduit throughout.

Water damage at ceiling

Water damage at wall

ADA

- Lack of compliant door hardware throughout.
- Non-compliant handrails and handrail extensions.
- Contrast warning stripes must be added to treads at exterior stairs.
- No accessible seating in classrooms.
- Replace closers at all exterior doors - doors require too much force to open.

Classroom Building - Signs of ponding.

Maintenance

- Prevalent water damage to ceilings and walls throughout.
- Replace adhered ceiling tiles due to water damage.
- Carpet needs to be replaced due to stains, gouges, or wear.
- Light levels in some classrooms are insufficient.
- Replace diffuser grills.
- Replace wall base throughout.
- Existing roof is a built-up roofing system.
- Signs of significant ponding
- Heavy blistering throughout.
- Flashing seems to be in reasonable condition

Supply air register - Occupants have partially blocked register as a means of controlling air flow.

05 CLASSROOM BUILDING

Building Description

Site and Building Configuration

The site is a slope from the north side down one level to the south side. The building, constructed in 1972, has 6800 square feet and is two stories high. The second floor is approximately 12 feet high and the roof, including entry trellis, is approximately 24 feet high.

Structural System

Structural plans were available for this building. The primary roof and second floor gravity system consists of a concrete deck spanning to concrete beams which span to exterior and interior concrete walls. The trellis on the north, east, and west sides consists of concrete beams and columns. The foundation system consists of continuous footings. Evidence of settlement was not observed.

The primary lateral system consists of concrete diaphragms spanning to exterior and interior concrete walls.

Overall Seismic Deficiencies and Expected Seismic Performance

The building has well distributed lateral load resisting concrete walls. In a seismic event the windows and non-bearing gypboard walls would probably suffer typical damage in the form of broken glass and cracked gypboard walls. The ceiling would probably suffer typical damage in the form of cracked and displaced tiles.

05 CLASSROOM BUILDING

Figure 1 – Example of vibration isolators that are shot and need to be replaced.

Figure 2 – Example of no seismic bracing on the piping or the duct work.

Figure 3 – Example of door gaskets that need to be replaced.

General Description

The Classroom Building was constructed in 1970 and is two floors high. A multi-zone air handling unit located in the mechanical room serves the entire building. The air handling unit receives the required heating hot and chilled water from the secondary boiler and chiller plant, located in the Student Services A Building.

Deficiencies

General

- No insulation is provided for the walls and roof.
- Thermostats are mounted at heights noncompliant with the American's with Disabilities Act (ADA).
- No seismic bracing is provided for the piping and the ductwork.

Mechanical Room #106

Contains one multi-zone air handling unit.

- No P-trap is provided on the condensate drain, allowing unit to leak conditioned air through the pipe.
- The air handling unit and ductwork need environmental cleaning.
- The gaskets on the air handling unit's doors need to be replaced.
- The air handling unit's interior liner is in poor condition and needs to be replaced.
- Spring vibration isolators for the air handling unit are shot and need to be replaced.

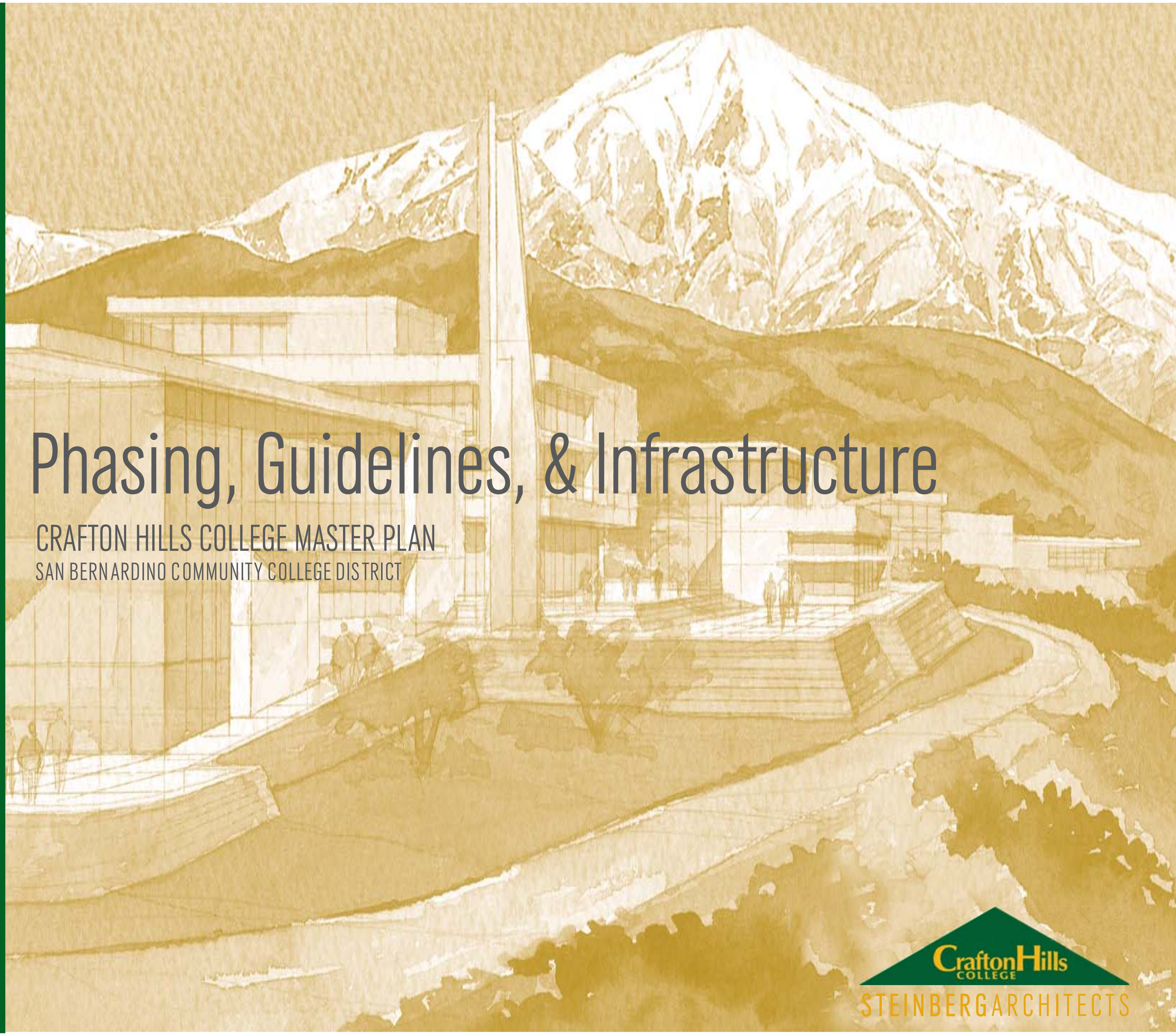
Recommendations

- Replace the bearings on the fans.
- Replace the fans' sheaves and belts.
- Environmentally clean the air handling unit and ductwork.
- Refurbish the air handling unit.
- Install P-trap on the condensate drain.
- Install seismic bracing on the piping.
- Install seismic bracing on the ductwork.
- Replace vibration isolators on the air handling unit.
- Replace the gaskets on the unit's doors.
- Replace the interior liner.
- Lower the height of the thermostats to ADA levels.
- Patch any test holes or leaks on the air handling unit.

Volume 4 Phasing, Guidelines, & Infrastructure

CRAFTON HILLS COLLEGE MASTER PLAN

SAN BERNARDINO COMMUNITY COLLEGE DISTRICT



Crafton Hills College

STEINBERG ARCHITECTS

Volume 1 Master Plan

Volume 2 Master Program

Volume 3 Existing Facilities Assessment

Volume 4 Phasing, Guidelines, and Infrastructure

1 | SUMMARY

OVERVIEW

Volume 4 of the Master Planning documents addresses how the college will implement the vision of the Master Plan. Many changes will occur on this campus over the course of the next twenty years. The phasing of the work, the projects, and the project boundaries are outlined in the Chapter 2. Through workshops with the Master Plan Committee, a series of projects have been broken out of the 2025 Master Plan; these are projects which are necessary to lay the foundation for future growth, as well as those that address the college's most pressing academic needs. Therefore an intermediate phase is shown throughout Volume 4 that illustrates projects to be completed by 2012. Chapter 3 illustrates architectural and landscape guidelines that are set forth that give direction for new projects in terms of expression and aesthetic, and standards are set for building materials, hardscape and planting materials, signage, and lighting.

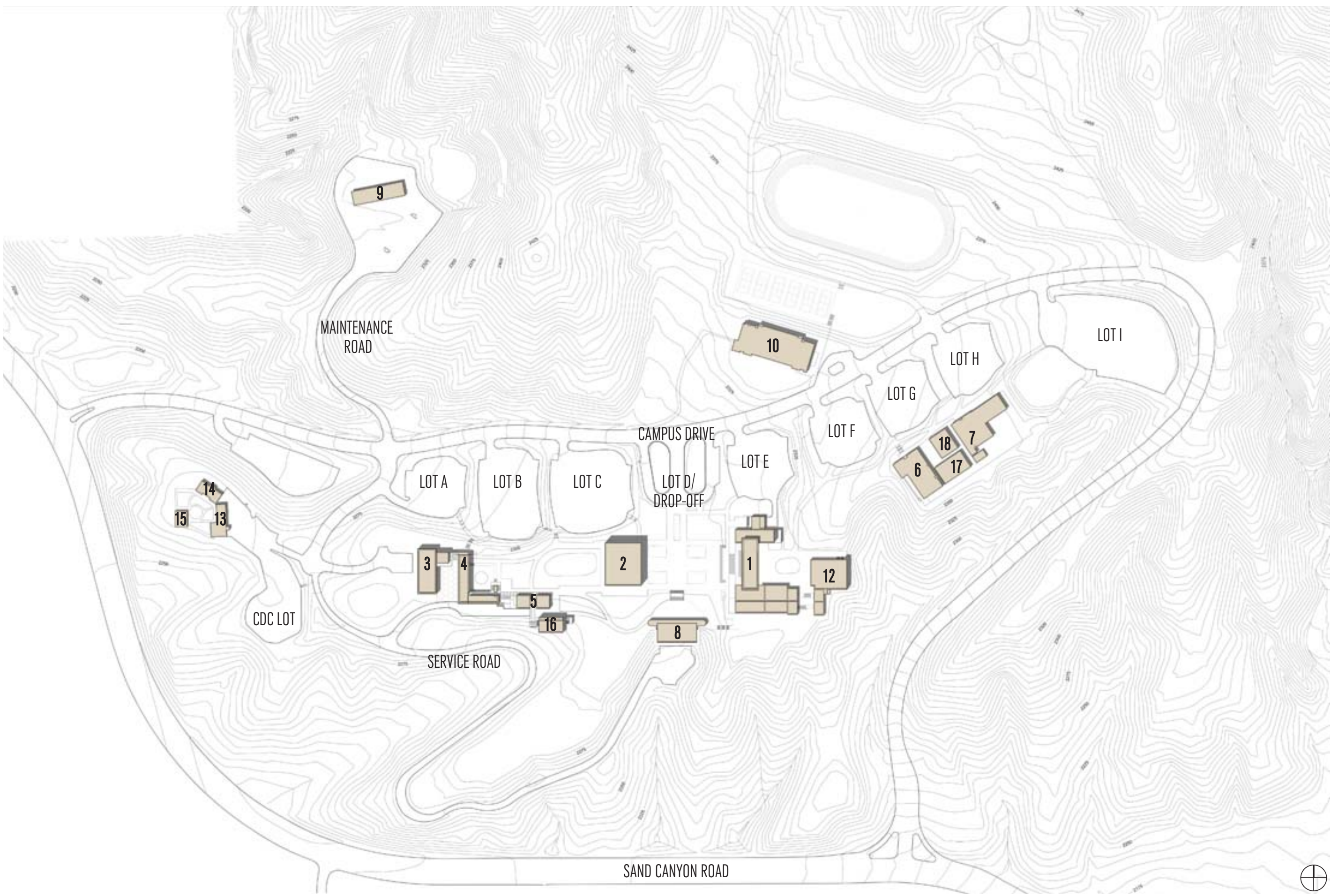
The last chapter addresses campus infrastructure. As detailed in volume 3, the Existing Facilities Assessment, many of the college's site and building systems are outdated and are in need of repair or replacement. Chapter 5 deals with upgrades to the college's fire access routes and parking, as well as the addition of new ones. There are also extensive plans for water distribution and fire protection, site drainage, site grading, and irrigation, along with chilled and hot water lines, gas lines, and electrical and data conduit pathways.

2025 Master Plan

Phasing | 2

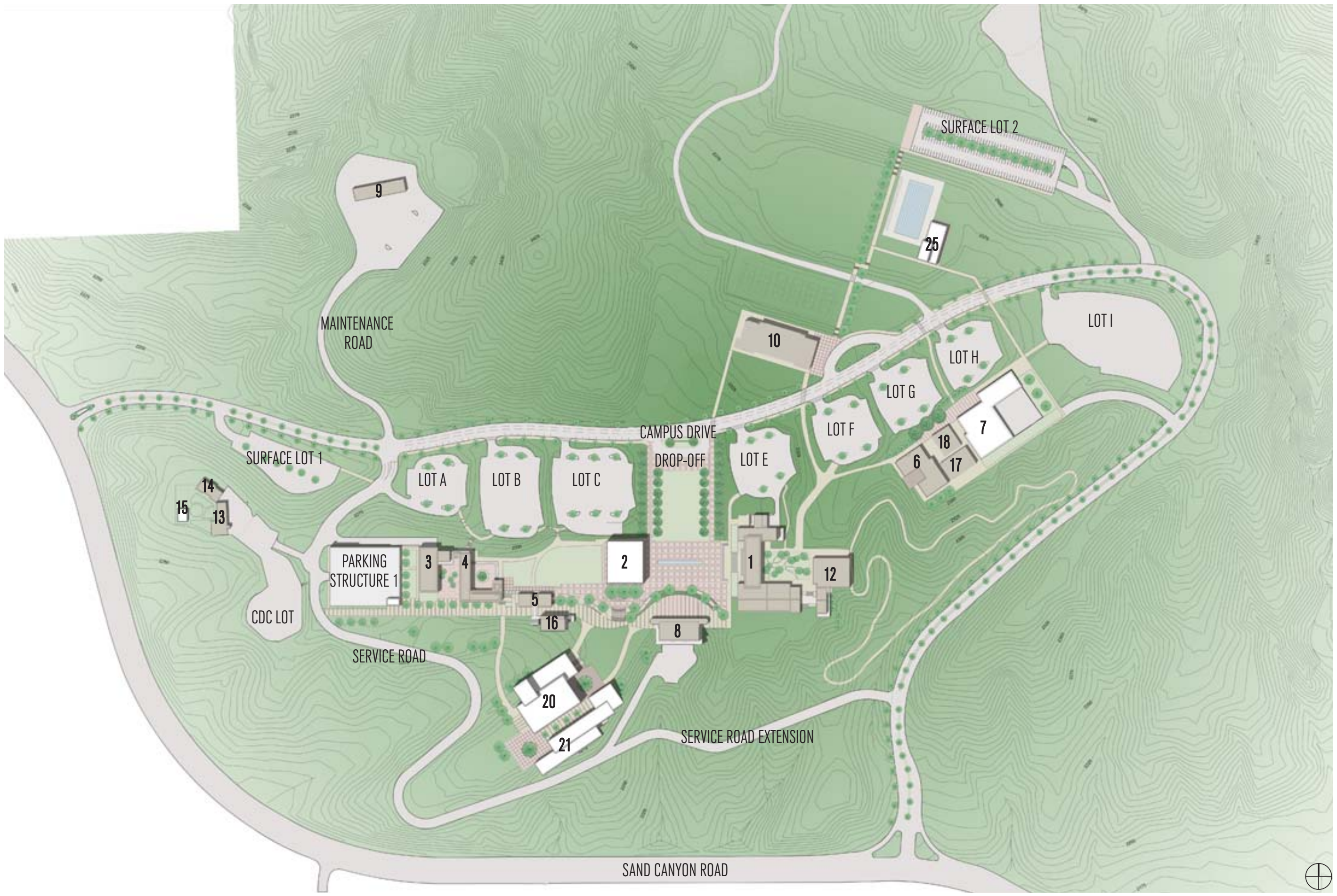
2 | PHASING

EXISTING CAMPUS PLAN



NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

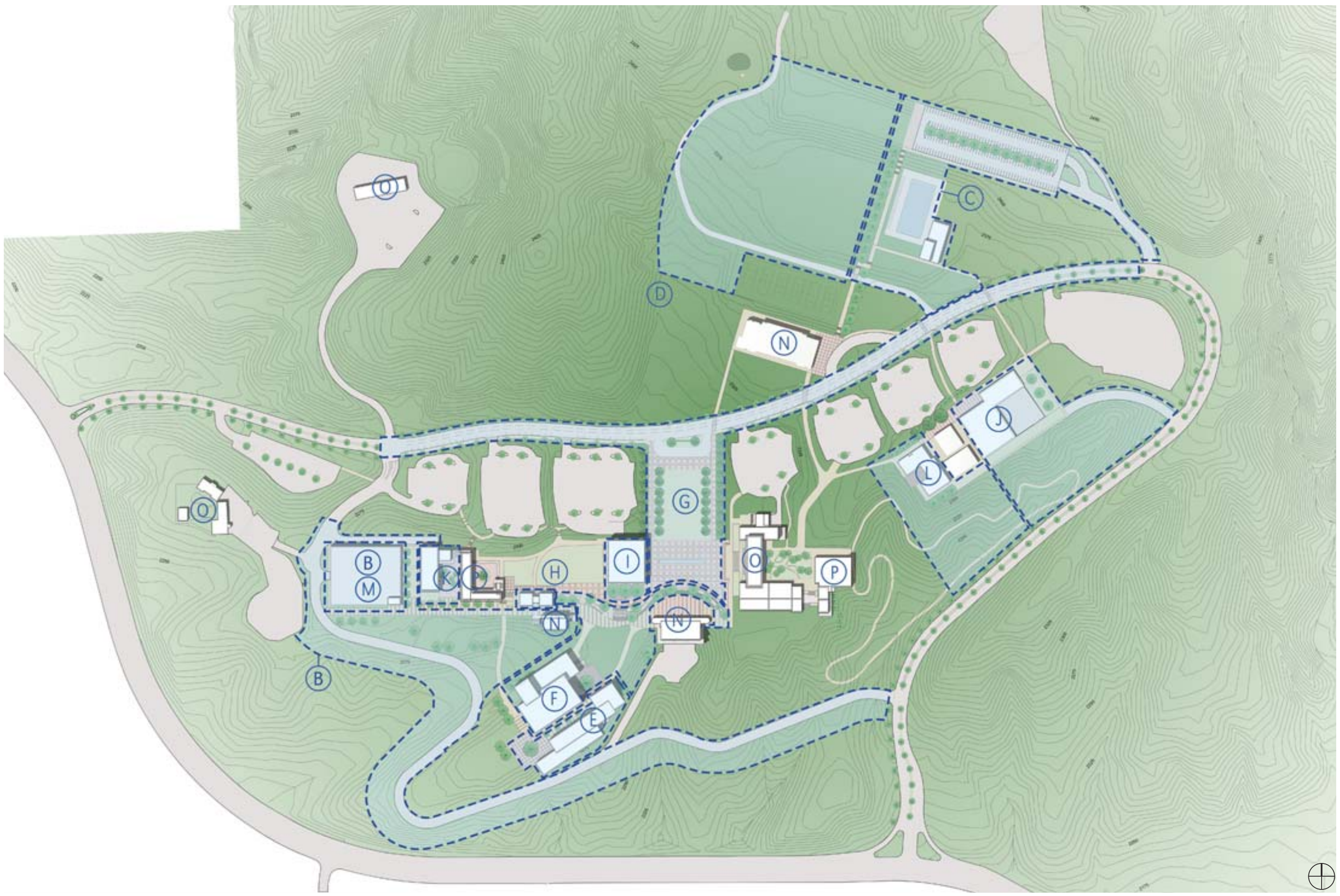
2012 MASTER PLAN



NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	**STUDENT CENTER**
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C (former Classroom Building)
6	OCCUPATIONAL EDUCATION 1
7	**EMERGENCY SERVICES** (OE2 replacement building)
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	CLASSROOMS (former Bookstore)
18	CLASSROOMS
19	NOT USED
20	**LEARNING RESOURCE CENTER**
21	**HUMANITIES 1**
22	NOT USED
23	NOT USED
24	NOT USED
25	**COMMUNITY RECREATIONAL FACILITY**
26	NOT USED

* 2012 new buildings are indicated by bold font

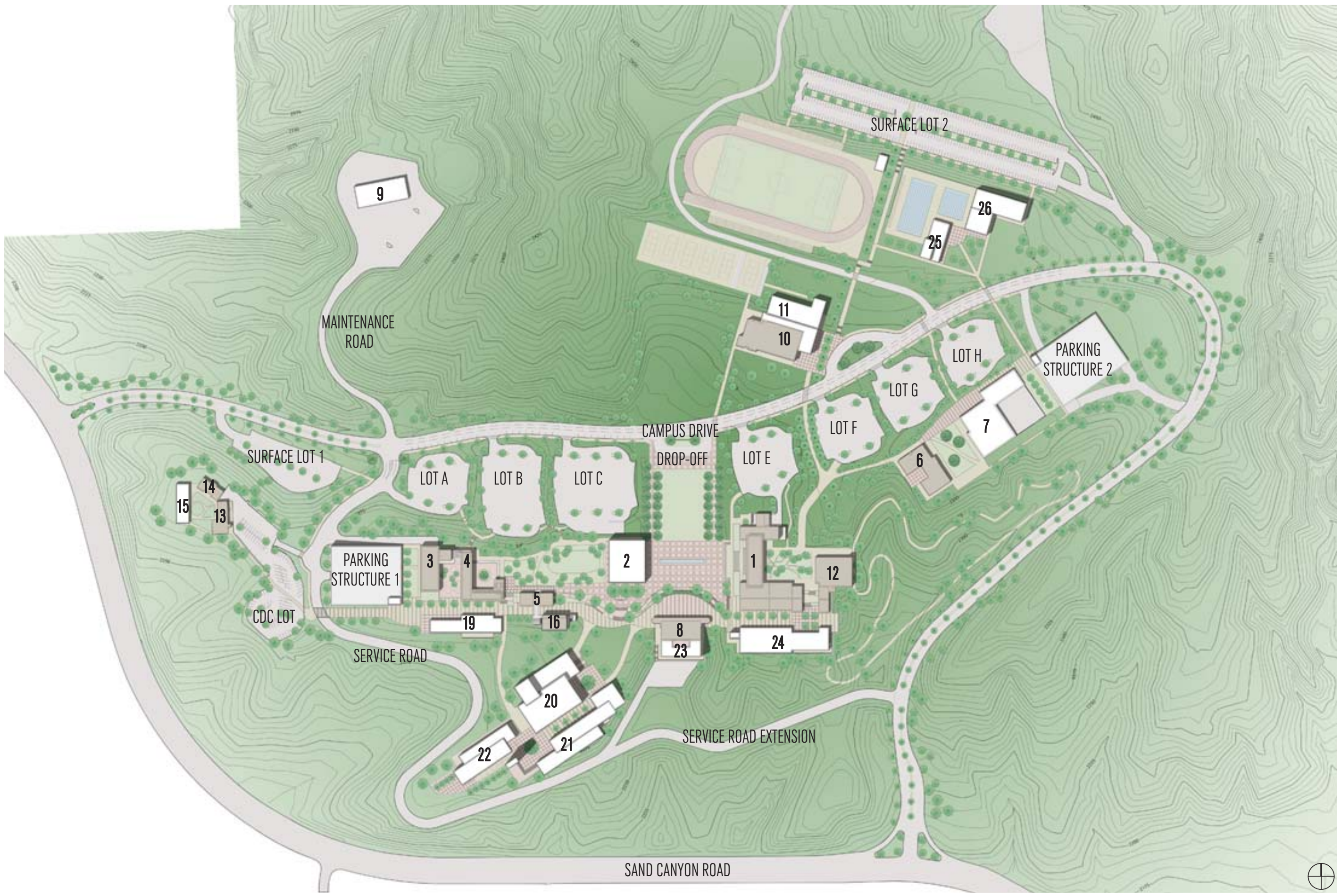
2012 PROJECTS



PROJECT NO.	PROJECT DESCRIPTION
A	CAMPUS INFRASTRUCTURE UPGRADES Water, Sewer, Drainage, Irrigation, Gas, CHW, HHW, Electric, Data & Comm., Central Plant Expansion
B	NEW PARKING LOT & LOOP ROAD Surface lot - 120 spaces, fire access/ service road, landscape/hardscape
C	NEW COMMUNITY RECREATIONAL FACILITY Natatorium (50M pool & locker rooms), parking lot, landscape/hardscape
D	ATHLETIC FIELDS SITE GRADING
E	NEW GENERAL EDUCATION BUILDING Classrooms, computer labs, offices, meeting rooms, landscape/hardscape
F	NEW LRC & PENINSULA DEVELOPMENT/ACCESS Library, computer labs, classroom, office, campus data center, meeting rooms, AV/TV; peninsula site grading; living wall; landscape/hardscape
G	ENTRY QUAD Landscape/hardscape, drop-off; campus drive strip ing, sidewalks, landscape/trees
H	STUDENT SERVICES C (CLASSROOM BUILDING RENOVATION) Financial Aid, Health Center, EOPS, classroom
I	NEW STUDENT CENTER Cafeteria/dining, bookstore, classrooms, student lounge, meeting rooms; new loading dock area
J	NEW EMERGENCY SERVICES Classrooms, computer labs, coverd outdoor vehicle storage, fire access/ grading; landscape/hardscape
K	COLLEGE CENTER RENOVATION
L	OCCUPATIONAL EDUCATION #1 RENOVATION Classrooms, computer labs, offices
M	NEW PARKING STRUCTURE #1 740 spaces, sitework
N	FINISH UPGRADES Gymnasium, Perfoming Arts Center
O	FINISH UPGRADES Maintenance, Lab/Admin, CDC
P	FINISH UPGRADES SSA, SSB, Chemistry/ Health Science

- New Buildings - Exterior Plaster Finish, insulated glazing, c.i.p. conc. structural frame.
- Major Renovation - New plumbing, fire protection, electrical, HVAC systems, upgrade struct. as req'd., new finishes & space planning, exterior work as as req'd., complete ADA compliance
- Finish Upgrade - new floor & wall finishes, replace ceiling tile as req'd

2025 MASTER PLAN



NO.	BUILDING NAME
1	LABORATORY CENTER (former Laboratory/Administration Building)
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C (former Classroom Building)
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES (OE2 replacement building)
8	PERFORMING ARTS CENTER
9	**MAINTENANCE & OPERATIONS**
10	GYMNASIUM
11	**WELLNESS CENTER**
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	**CHILD DEVELOPMENT CENTER EXPANSION**
16	STUDENT SERVICES B
17	DEMOLISHED - CLASSROOMS
18	DEMOLISHED - CLASSROOMS
19	**ADMINISTRATION/ STUDENT SERVICES**
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	**HUMANITIES 2**
23	**PERFORMING ARTS CENTER EXPANSION**
24	**SCIENCES**
25	COMMUNITY RECREATIONAL FACILITY
26	**COMMUNITY CENTER**

* 2025 new buildings are indicated by bold font

2025 PROJECTS

PROJECT NO.	PROJECT DESCRIPTION
AA	PARKING LOT UPGRADES
BB	EMERGENCY SERVICES PLAZA
CC	LABORATORY CENTER (EXISTING LADM RENOVATION) Classrooms, labs; landscape/hardscape
DD	CHEMISTRY (EXISTING CHEM/HEALTH RENOVATION) Classrooms, labs; landscape/hardscape
EE	GYMNASIUM & WELLNESS CENTER Gymnasium renovation - gym, multi-purpose rooms; New Wellness Center - multi purpose rooms, fitness center, weight room; locker rooms, showers; landscape/ hardscape
FF	ATHLETICS FIELDS Soccer field, synthetic track, bleachers, lighting; Tennis courts, bleachers, lighting; landscape/hardscape
GG	NEW HUMANITIES BUILDING 2 Classrooms, computer labs, offices, meeting rooms
HH	PARKING STRUCTURE 2 1,300 spaces, landscape/hardscape
II	NEW ADMINISTRATION/STUDENT SERVICES BUILDING Offices, meeting rooms
JJ	PERFORMING ARTS COMPLEX Existing Performing Arts Center Renovation; New Perfoming Arts Expansion - art studios, black box theater, classrooms, computer labs, offices
KK	NEW CHILD DEVELOPMENT EXPANSION Classrooms, offices
LL	NEW SCIENCES BUILDING Wet labs, computer labs, offices
MM	STUDENT SERVICES A RENOVATION Offices, open office, meeting rooms
NN	NEW MAINTENANCE BUILDING
OO	STUDENT SERVICES B RENOVATION Offices, meeting rooms
PP	COMMUNITY BUILDING & WELLNESS POOL
QQ	CAMPUS DRIVE LANDSCAPING, PHASE 2
RR	CAMPUS WIDE SITE LANDSCAPING
SS	CAMPUS WIDE SITE LIGHTING

- New Buildings - Exterior Plaster Finish, insulated glazing, c.i.p. conc. structural frame.
- Major Renovation - New plumbing, fire protection, electrical, HVAC systems, upgrade struct. as req'd., new finishes & space planning, exterior work as as req'd., complete ADA compliance
- Finish Upgrade - new floor & wall finishes, replace ceiling tile as req'd

3 | ARCHITECTURAL GUIDELINES

EXISTING CHARACTER

CANTILEVER

BRIDGE

MASS

TRANSITION

EXISTING	PROPOSED
Cantilever Bridge	Floating
	Transparency
	Entry
Mass	Base
Transition	Threshold

ARCHITECTURAL EXPRESSION

Figure 1.

Figure 2.

Figure 3.

Floating

Transparency

Floating

Floating

Base

Transparency

Figure 1. Neurosciences Institute. La Jolla. 1996.
Tod Williams Billie Tsien & Associates.
photo from severud.com

Figure 2. Kunstgalerie Goetz. Munich, Germany. 1992.
Herzog & de Meuron.
photo by: Hisao Suzuki

Figure 3. Centro Deportivo en Galdácano. Vizcaya, Spain. 1996-2000.
Juan Carlos Sancho Osinaga | Sol Madridejos.
photo by: Hisao Suzuki

ARCHITECTURAL EXPRESSION

Figure 1.

Figure 2.

Figure 3.

Transparency

Entry

Transparency

Entry

Figure 1. Pabellón Docente de la Arrixaca. El Dalmar, Spain. 1996-2001.
Juan Carlos Sancho Osinaga | Sol Madridejos.
photo by: Hisao Suzuki

Figure 2. University of Otago Central Library.
Dunedin, New Zealand. 2000.
Hardy Holzman Pfeiffer Associates
photo from HHPA

ARCHITECTURAL EXPRESSION

Figure 1.

Figure 2.

Figure 3.

Base

Base
Transition

Base
Building

Figure 1. Santo Domingo de Bonaval Garden.
Santiago de Compostela, Spain. 1990-1994.
Alvaro Siza
photo from Alvaro Siza Office

Figure 2. The Getty Center. Los Angeles. 1984-1997.
Richard Meier
photo from the Getty Foundation

Figure 3. The Getty Center. Los Angeles. 1984-1997.
Richard Meier
photo from the Getty Foundation

ARCHITECTURAL EXPRESSION

Figure 1.

Figure 1. David Vieria de Castro House.
Famalicão, Portugal. 1984-1994.
photo from Alvaro Siza Office

Figure 2. Galician Center of Contemporary Art.
Santiago de Compostela, Spain. 1988-1993.
Alvaro Siza
photo by: Hisao Suzuki

Figure 3. Mattin Center. Johns Hopkins University.
Baltimore. 2001.
Tod Williams Billie Tsien Associates
photo by: Michael Moran

MATERIALS

A EXTERIOR PLASTER

B GLAZING / MULLIONS

MATERIALS

C PRECAST CONCRETE COPING / SILLS



D CONCRETE BOARD FORM



4 | LANDSCAPE GUIDELINES

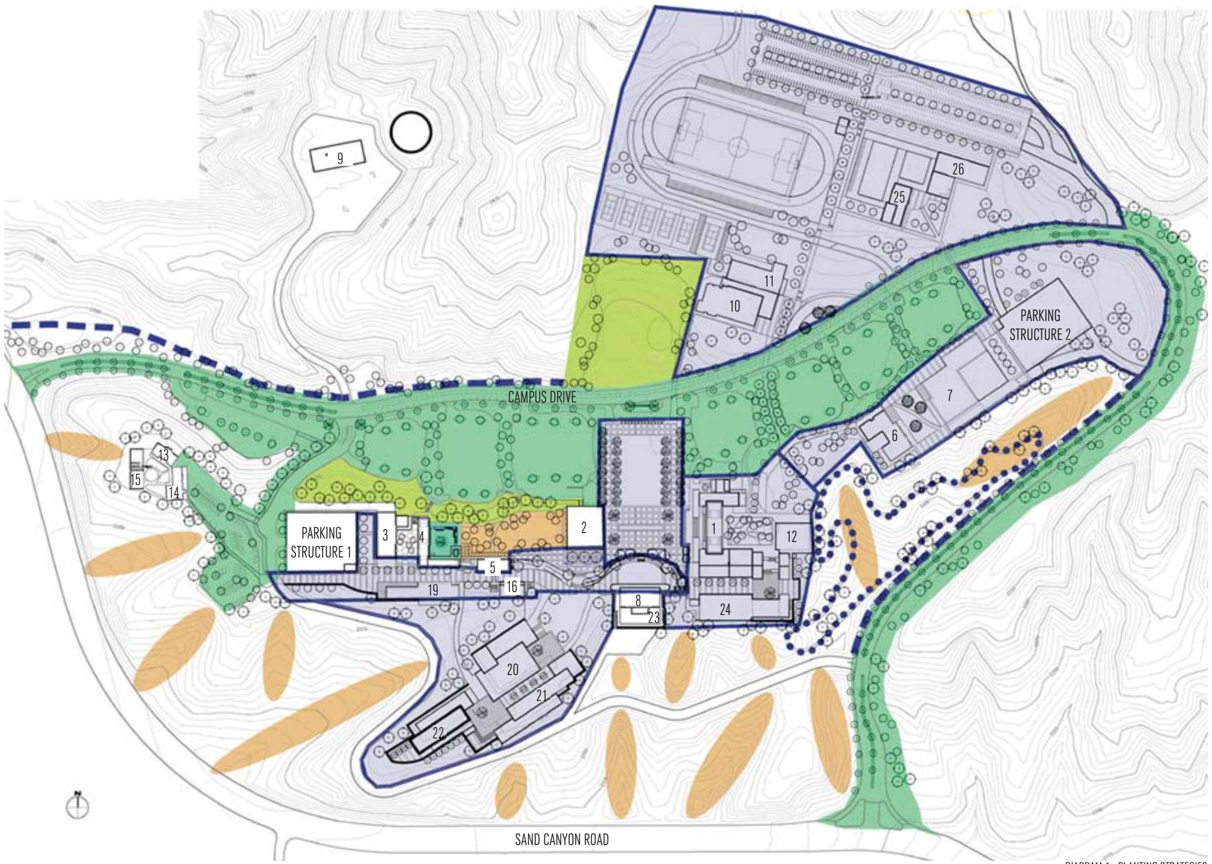


DIAGRAM 1: PLANTING STRATEGIES

Diagram 1 (left) identifies several planting strategies, described below. The planting strategies reinforce the broad vision of the Landscape Plan.

- Enhance the existing natural landscape
- Create distinct Cluster landscapes
- Enhance campus entries and roads
- Vegetate fire buffer zones
- Maintain evergreen screens, particularly along parking lot perimeters and transition areas
- Reduce the current amount of golf course turf area
- Create a sustainable landscape

LEGEND

ADDITIONS

RESTORATIONS

REPLACEMENTS

ENHANCEMENTS

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	NOT USED
18	NOT USED
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

ADDITIONS

Within the Campus Clusters (Humanities, Sciences/Math/BIT, etc.), new planting will support the thematic ideas discussed earlier for these areas. Plant selections will focus primarily on low to moderate water use material.

Plant selections and placement around defined areas of structures will be in accordance with the fire department's "fuel modification planting zone requirements".

As part of the Sciences/Math/BIT Cluster, a new hiking trail will provide an opportunity for students to learn about the adjacent hillside habitat. Exotic plant material will be removed and trail markers will identify plants and animals viewed along the trail.

At the western entry of Campus Drive, a new landscape feature will demonstrate ideas of utilizing the existing stormwater channel as a design element. Riparian or coastal sage habitat species will be used accordingly.

At the eastern entry of Campus Drive, a natural swale will be developed into an etnry element that can be viewed from nearby campus overlooks or experienced along the new hiking trail. The landscape will feature riparian or coastal sage habitat plant species.

RESTORATIONS

Within the surrounding naturalized hills, selected areas will be revegetated with coastal sage habitat plant species. The selected revegetation will focus on hillside areas that maximize views from campus.

Within the Central Lawn, west of the Student Center, damaged turf grass and other plant material will be replaced. Existing shade, soil and pedestrian traffic conditions may be reasons for the areas of damage. Replacement plants will be selected as appropriate for the condition without changing the original character of the space.

REPLACEMENTS

A grove of red gum trees (Eucalyptus camaldulensis) and other trees provide an evergreen buffer on the slope between between parking lots A/B/C and the western campus. According to the 2005 Arborist's report*, many of the trees are in decline for numerous reasons, including psyllid infestations and poor pruning. The trees are to be replaced with a grove of pine and cedar trees. The pine trees will continue to provide the evergreen screening desired for this slope.

Most of the existing golf course will be replaced with the new natatorium, athletic and community facilities, while the golf putting greens will remain. The remaining open space (located north of the Central Quad lawn) will be replaced with native and drought tolerant plant species. Existing trees along the perimeter of the open space will be supplemented with an informal placement of new canopy and coniferous trees in keeping with the surrounding coastal sage habitat.

* See Consulting Arborist's Report, "Tree Management & Preservation Study," by Greg Applegate, dated 8/24/05.

ENHANCEMENTS

The existing hedge along the perimeter of the Student Services Terrace planter will be replaced with new plantings within the terraced seating area. New plant material will complement the existing Gingko trees located at the center of the plaza. The existing turf grass within the central planter will be replaced with a drought tolerant groundcover.

Within the parking lot islands, new shade canopy trees will replace damaged, diseased or missing trees (refer to Arborist's recommendations for existing trees*). The new trees will be placed where planting islands are a minimum four-feet wide. Around the perimeters of the parking lots, existing planting will be supplemented in order to increase the visual screening of the parking lots and enhance the Campus Drive experience.

The campus entries at both ends of Campus Drive will be replaced with accent plantings of primarily drought tolerant plant species. Oak trees will be the featured plant material at the entries.

At the eastern entry of Campus Drive, new trees will be planted along the street's perimeter and within new medians. For a segment of the street nearest Sand Canyon Road, large vertical trees will mark the campus entry. All trees will be placed so that views up to the campus are not blocked. They will also be placed equidistantly to create a sense of formality and rhythym along the street.

As Campus Drive curves and becomes an east-west road, a variety of existing evergreen and deciduous trees and shrubs can be seen along its edges. At the road's most eastern end, a repeatedly planting of one tree species will add a sense of arrival and visual continuity along this section of campus.

At the western entry of Campus Drive, the character of the street is once again changed. The existing trees along this end of Campus Drive are primarily conifers (i.e., Pinus and Calocedrus species) and London Plane trees. This entry drive has an informal and naturalized character. Along the new median, oak trees will be planted to enhance this quality. The plantings along the roadsides will be selectively cleared and replanted to allow views from the road into the stormwater catchment area (see "Landscape Additions") at its western perimeter and views up to the campus.

For all new trees placed along Campus Drive, the center of trees will be placed a minimum of six feet away from the road edge or walkways.

SUSTAINABLE DESIGN AND MAINTENANCE

Although not shown on the diagram, sustainable design is an underlying principle for the campus landscape. The following guidelines will be incorporated into the design and ongoing maintenance of the campus landscape.

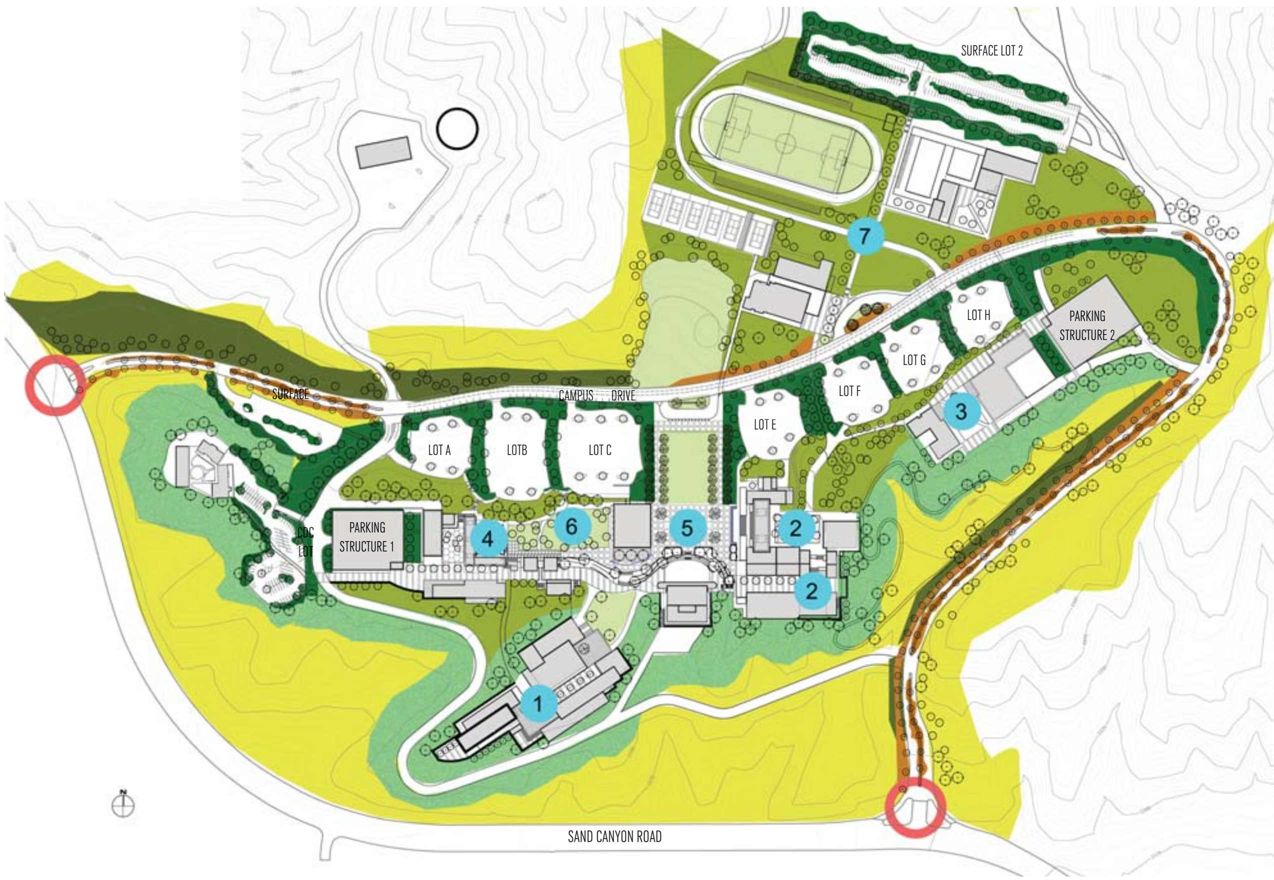
- Provide screening from winds
- Provide plantings that shade structures and outdoor spaces from the summer sun while providing for winter sun exposure
- Increase the biodiversity of plant species
- Consider alternatives for storm drainage management, such as detaining water on-site and allowing it to percolate through porous surfaces
- Reduce reliance on landscape chemical applications by incorporating such maintenance practices as composting or organic amendments, mulch applications, soil management, and recycling materials (such as plant trimmings, building and paving material).

DISPOSITION AND CARE OF EXISTING TREES

Removal and maintenance of remaining existing trees will be completed according to the Consulting Arborist's recommendations*.

* See Consulting Arborist's Report, "Tree Management & Preservation Study," by Greg Applegate, dated 8/24/05.

PLANT MATERIAL GUIDELINES | PLANTING ZONES



LEGEND

- CAMPUS DRIVE
- COASTAL SAGE COMMUNITY
- FUEL MODIFICATION ZONE
- RIPARIAN CORRIDOR
- TRANSITION AREA
- PARKING LOT
- LAWN AREA
- ENTRY GATEWAY
- CLUSTER AREA: # AS BELOW
  1 HUMANITIES
  2 SCIENCES/MATH/BIT
  3 EMERGENCY SERVICES
  4 STUDENT SERVICES
  5 CENTRAL QUAD
  6 CENTRAL LAWN
  7 COMMUNITY RECREATIONAL

DIAGRAM 2: PLANTING ZONES

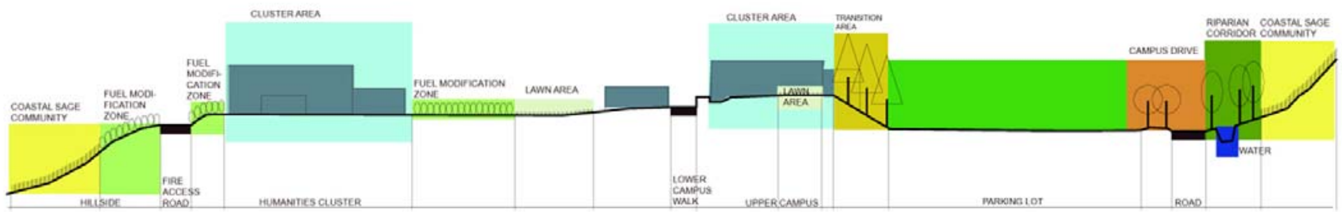


DIAGRAM 3: CROSS SECTION OF PLANTING ZONES

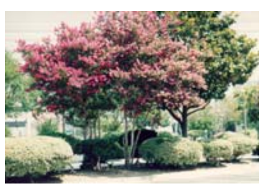
Diagram 2 (previous page) and Diagram 3 (this page) show the intent of the the planting zones for the campus. As the landscape zones move from the campus core to the natural hillsides, the design intent is to increase the use of drought tolerant plant material where possible. Over the long-term, the College can reduce its level of irrigation water needs from current campus-wide levels. Within the "fuel modification zones," the plant palette will meet the fire department's requirements for such areas.

PLANT MATERIAL GUIDELINES | PLANT LIST

			POTENTIAL PLANTING AREA							
Plant Type	Botanical Name	Common Name	Evergreen (E)/ Deciduous (D)	DR	CS	FM	RIP	TRANS	LOT	CLUS
TREE	ACACIA FARNESIANA	SWEET ACACIA	D			X				
TREE	ALBIZIA JULIBRISSIN	MIMOSA, SILK TREE	D					X		X
TREE	BRACHYCHITON ACERIFOLIUS	FLAME TREE	D			X		X	X	
TREE	CALOCEDRUS DECURRENS	INCENSE CEDAR	E					X		X
TREE	CEDRUS ATLANTICA GLAUCA	BLUE ATLAS CEDAR	E					X		X
TREE	CEDRUS DEODORA	DEODAR CEDAR	E					X		X
TREE	CERCIDIUM SP.	PALO VERDE SELECTIONS	D	X		X				
TREE	CERCIS SP.	REDBUD SELECTIONS	D			X	X			
TREE	CHILOPSIS LINEARIS	DESERT WILLOW	D						X	
TREE	CHITALPA TASHKENTENSIS	CHITALPA	D						X	X
TREE	CINNAMOMUM CAMPHORA	CAMPHOR TREE	E							X
TREE	CUPRESSUS SP.	CYPRESS SELECTIONS	E					X		X
TREE	GEIJERA PARVIFOLIA	AUSTRALIAN WILLOW	E					X	X	X
TREE	GINGKO BILOBA	MAIDENHAIR TREE	D							X
TREE	GLEDITSIA TRIACANTHOS	HONEY LOCUST	D	X						
TREE	KOELREUTERIA PANICULATA	GOLDENRAIN TREE	D						X	X
TREE	LAGERSTROEMIA INDICA	CRAPE MYRTLE	D							X

LEGEND
CLUS = CLUSTER AREAS
CS = COASTAL SAGE COMMUNITY
DR = DRIVEWAYS & CAMPUS ENTRIES
FM = FUEL MODIFICATION ZONE
GC = GROUNDCOVER
LOT = PARKING LOT PERIMETERS & ISLANDS
RIP = RIPARIAN CORRIDORS
TRANS = TRANSITION AREAS


CINNAMOMUM CAMPHORA


LAGERSTROEMIA INDICA


OLEA EUROPAEA


KOELREUTERIA PANICULATA


CEDRUS DEDORA

A recommended list of plants is provided in this section. The list also suggests the target areas for using the plant material. Other plant species can be added, but only after considering their compatibility with the design intent and palette (e.g., color, water use) for the specific area.

New trees shall have a minimum size of 24-inch box. Where the design of a plaza or outdoor space requires a significant tree presence, specimen-sized trees, 60-inch box minimum, shall be selected.

Certain tree species are recommended as theme or primary trees for specific areas. These trees are identified below:

- East Campus Drive: Poplar nigra 'Italica' (Lombardy Poplar) along a portion of the entry drive and median and Quercus sp. (Oak) for the balance of the street and median
- Central Campus Drive: Hybrid of Platanus acerifolia (London Plane) that is resistant to anthracnose, such as P. acerifolia 'Bloodgood'
- West Campus Drive: Quercus sp. (Oak) in median
- Central Quad: Cinnamomum camphora (Camphor) along the great lawn promenades. Specimen-sized Quercus sp. (Oak) in the large plaza.
- Humanities Cluster: Olea europaea, (Olive, fruitless varieties only), Cupressus sempervirens (Italian Cypress),
- Sciences/Math/BIT Cluster Display Garden: Quercus sp. (variety of Oak species)
- OE Quad: Cedrus Deodara (Deodar Cedar), Cedrus Atlantica (Atlas Cedar), Metasequoia glyptostroboides (Dawn Redwood, a rare deciduous conifer tree)
- Slope between Parking Lots A/B/C and the western campus: grove of Pinus sp. (pine selections)
- Central Lawn (between Student Center and SSA building): Retain existing tree species – Platanus acerifolia (London Plane).

PLANT MATERIAL GUIDELINES | PLANT LIST

Plant Type	Botanical Name	Common Name	POTENTIAL PLANTING AREA Evergreen (E)/ Deciduous (D)	DR	CS	FM	RIP	TRANS	LOT	CLUS
TREE	LIRIODENDRON TULIPIFERA	TULIP TREE	D			X				
TREE	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	E							X
TREE	METASEQUOIA GLYPTOSTROBOIDES	DAWN REDWOOD	D							X
TREE	OLEA EUROPAEA	OLIVE	E							X
TREE	PARKINSONIA ACULEATA	MEXICAN PALO VERDE	D	X					X	
TREE	PINUS BRUTIA	CALABRIAN PINE	E					X		
TREE	PINUS CANARIENSIS	CANARY ISLAND PINE	E					X	X	
TREE	PINUS ELDARICA	MONDELL PINE	E					X		
TREE	PINUS HALEPENSIS	ALEPPO PINE	E					X		
TREE	PINUS PINEA	ITALIAN STONE PINE	E					X		X
TREE	PISTACIA CHINENSIS	CHINESE PISTACHE	D					X	X	X
TREE	PLATANUS ACERIFOLIA	LONDON PLANE	D	X						
TREE	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	D			X	X		X	X
TREE	POPULUS NIGRA 'ITALICA'	LOMBARDY POPLAR	D	X						
TREE	PRUNUS CAROLINIANA	CAROLINA LAUREL CHERRY	E				X			
TREE	PYRUS CALLERYANA	FLOWERING PEAR	D							X
TREE	QUERCUS SP.	OAK SELECTIONS	D/E	X		X	X		X	X
TREE	ULMUS PARVIFOLIA	CHINESE ELM	E/D					X		X
TREE	UMBELLULARIA CALIFORNICA	CALIFORNIA LAUREL	E			X				
PERENNIAL	ACHILLEA SP.	YARROW SELECTIONS	E		X			X		
SUCCULENT	AGAVE SP.	AGAVE SELECTIONS	E	X		X				X
SUCCULENT	ALOE SP.	ALOE SELECTIONS	E	X		X				X
PERENNIAL	ANIGOZANTHOS FLAVIDUS	KANGAROO PAW	E	X		X				X

LEGEND
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CS = COASTAL SAGE COMMUNITY
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RIP = RIPARIAN CORRIDORS
TRANS = TRANSITION AREAS


QUERCUS AGRIFOLIA


PINUS CANARIENSIS


PISTACIA CHINENSIS


MAGNOLIA GRANDIFLORA


ALOE AND OTHER SUCCULENT PLANTINGS


ANIGOZANTHOS HYBRID


CEANOTHUS SP.


PLATANUS RACEMOSA

PLANT MATERIAL GUIDELINES | PLANT LIST

			POTENTIAL PLANTING AREA							
Plant Type	Botanical Name	Common Name	Evergreen (E)/ Deciduous (D)	DR	CS	FM	RIP	TRANS	LOT	CLUS
SHRUB	ARBUTUS UNEDO	STRAWBERRY TREE	E			X		X		X
SHRUB	ARCTOSTAPHYLOS SP.	MANZANITA SELECTIONS	E			X	X			
PERENNIAL	ARTEMESIA SP.	SAGEBRUSH SELECTIONS	E		X	X				
SHRUB/GC	BACCHARIS PILULARIS	DWARF COYOTE BRUSH	E		X	X				
SHRUB	CAESALPINIA SP.	BUSH BIRD OF PARADISE	D/E							X
GC	CAREX SP.	SEDGE SELECTIONS	D/E				X			X
SHRUB/GC	CEANOTHUS SP.	WILD LILAC SELECTIONS	E			X	X		X	
SHRUB	CERCIS OCCIDENTALIS	WESTERN REDBUD	D			X	X			
SHRUB/GC	COPROSMA PUMILA	-	E			X				
PERENNIAL	COREOPSIS SP.	COREOPSIS	E		X	X				
SHRUB	COTONEASTER SP.	COTONEASTER SELECTIONS	D/E							X
SHRUB	DENDROMECON RIGIDA	BUSH POPPY	E			X				
PERENNIAL	DIETES SP.	FORTNIGHT LILY	E	X						X
VINE/GC	DISTICTIS BUCCINATORIA	BLOOD RED TRUMPET VINE	E			X				X
SHRUB	DODONAEA VISCOSA	HOPBUSH	E			X		X		
SUCCULENT	DUDLEYA SP.	DUDLEYA SELECTIONS	E	X		X			X	
SHRUB	ENCELIA SP.	-	D		X	X				
GC	ERIOGONUM PARVIFOLIUM	CALIFORNIA BUCKWHEAT	E		X					
GC	ESCHSCHOLZIA CALIFORNICA	CALIFORNIA POPPY	D			X				
SHRUB	FEIJOA SELLOWIANA	PINEAPPLE GUAVA	E			X				X
GC	FESTUCA SP.	FESTUCA SELECTIONS	E	X					X	X
GC	FRAGARIA CHLOENSIS	EVERGREEN STRAWBERRY	E			X				X
PERENNIAL	GAURA LINDHEIMERI	GAURA	E							X
PERENNIAL	HEMEROCALLIS SP.	DAYLILY SELECTIONS	D/E							X

LEGEND
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CERCIS OCCIDENTALIS


COTONEASTER SP.


DIETES SP.


DISTICTIS BUCCINATORIA


DODONAEA VISCOSA


GAURA LINDHEIMERI


LANTANA SP.


LAVANDULA SP.

PLANT MATERIAL GUIDELINES | PLANT LIST

			POTENTIAL PLANTING AREA							
Plant Type	Botanical Name	Common Name	Evergreen (E)/ Deciduous (D)	DR	CS	FM	RIP	TRANS	LOT	CLUS
SHRUB	HETEROMELES ARBUTIFOLIA	TOYON	E		X		X			
PERENNIAL	HEUCHERA SP.	CORAL BELLS	E				X	X		X
SHRUB/GC	JUNIPERUS SP.	JUNIPER SELECTIONS	E					X		
SHRUB/GC	LANTANA SP.	LANTANA SELECTIONS	E					X	X	X
PERENNIAL	LAVANDULA SP.	LAVENDER SELECTIONS	E					X		X
SHRUB	LEUCOPHYLLUM FRUTESCENS	TEXAS RANGER	E					X		X
GC	LEYMUS CONDENSATUS	GIANT WILD RYE				X		X		
PERENNIAL	LOTUS SP.	LOTUS SELECTIONS	E			X				
SHRUB	MAHONIA AQUIFOLIUM	OREGON GRAPE	E			X	X			
PERENNIAL	MIMULUS SP.	MONKEY FLOWER	E		X	X				
PERENNIAL	MISCANTHUS SINENSIS	EULALIA GRASS	D							
PERENNIAL	MUHLENBERGIA RIGENS	DEER GRASS	E						X	
SHRUB	MYRTUS COMMUNIS	MYRTLE	E							X
PERENNIAL	NASSELLA SP.	FEATHER OR NEEDLE GRASS	D/E			X		X		
CACTI	OPUNTIA LITTORALIS	PRICKLY PEAR	E	X						
PERENNIAL	PENSTEMON SP.	PENSTEMON SELECTIONS	E					X		X
PERENNIAL	PEROVSKIA 'BLUE SPIRE'	RUSSIAN SAGE	D							X
PERENNIAL	PHORMIUM SP.	FLAX SELECTIONS	E	X				X	X	X
SHRUB	PUNICA GRANATUM	POMEGRANATE	D			X				X
SHRUB	PYRACANTHA SP.	FIRETHORN	E					X		
SHRUB	RHAMNUS SP	-	D/E			X	X			
SHRUB	RIBES SPECIOSA	GOOSEBERRY	D/E		X	X				
PERENNIAL	ROMNEYA COUTIERI	MATILIJA POPPY	E		X	X				
SHRUB/ VINE	ROSA SP.	ROSE SELECTIONS	D					X		X


MUHLENBERGIA RIGENS


PEROVSKIA 'BLUE SPIRE'


PHORMIUM SP.


PUNICA GRANATUM


ROMNEYA COUTIERI


OPUNTIA LITTORALIS


HEMEROCALLIS HYBRID


MIMULUS SP.

LEGEND
CLUS = CLUSTER AREAS
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PLANT MATERIAL GUIDELINES | PLANT LIST

			POTENTIAL PLANTING AREA							
Plant Type	Botanical Name	Common Name	Evergreen (E)/ Deciduous (D)	DR	CS	FM	RIP	TRANS	LOT	CLUS
SHRUB/GC	ROSMARINUS SP.	ROSEMARY SELECTIONS	E					X		X
PERENNIAL	SALVIA SP.	SAGE SELECTIONS	E		X			X		X
PERENNIAL	SEDUM SP.	STONECROPS	E	X				X		X
PERENNIAL	STIPA TENUISSIMA	MEXICAN FEATHER GRASS	D							
VINE/GC	TRACHELOSPERMUM JASMINOIDES	STAR JASMINE	E			X		X	X	X
GC	VINCA SP.	PERIWINKLE SELECTIONS	E					X		
SUCCULENT	YUCCA SP.	YUCCA SELECTIONS	E	X		X				X

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ROSMARINUS SP.


SALVIA SP.


ROSA SP.


TRACHELOSPERMUM JASMINOIDES

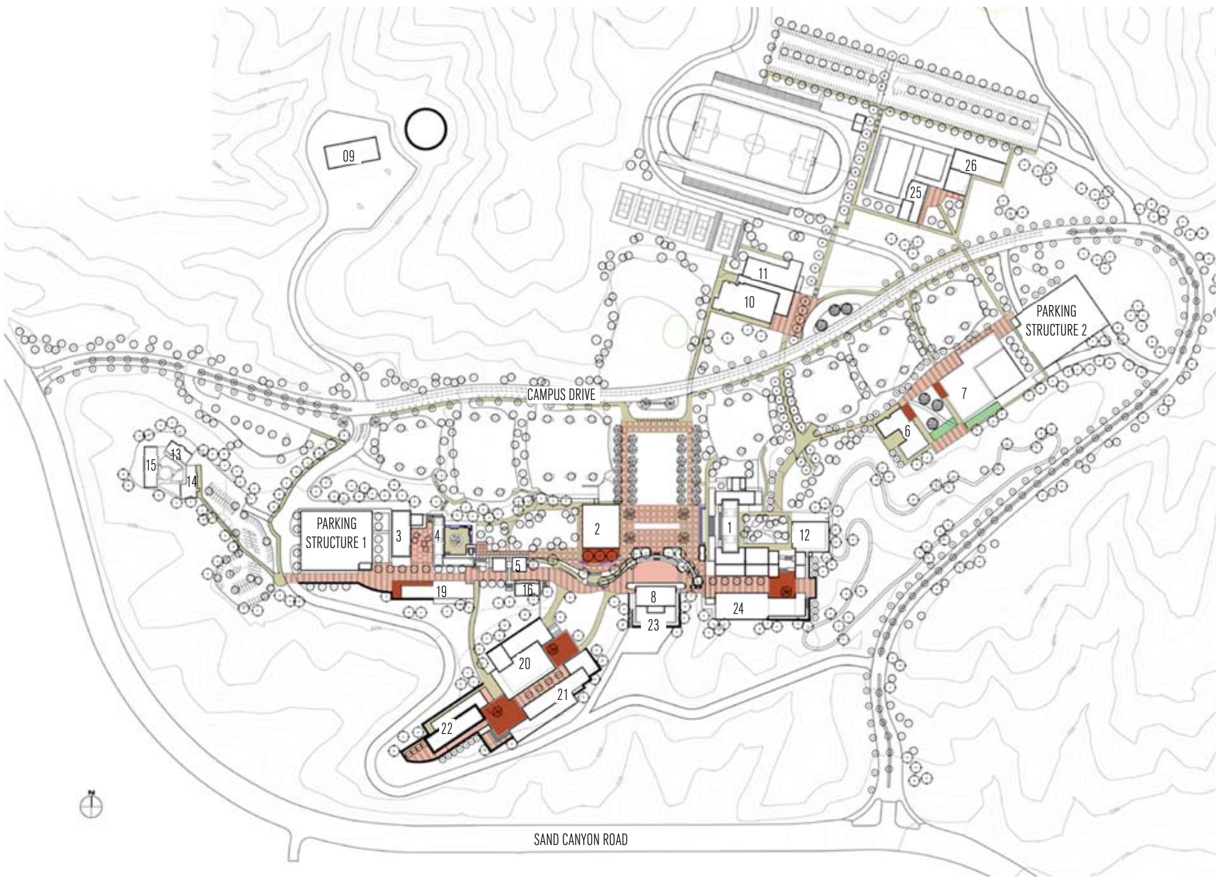

STIPA TENUISSIMA


YUCCA SP.


SEDUM NUSSBAUMERIANUM


VINCA MINOR

HARDSCAPE GUIDELINES



A focused selection of paving material can improve the campus functionality and aesthetics, and enhance the pedestrian environment. The Hardscape Plan (left) has multiple intentions:

- Clarify the hierarchy of pedestrian movement through campus
- Retain the historic character of the grid-patterned, colored concrete paving found within the campus core. The red and natural concrete pattern may require replacement due to wear. The red color should be matched as closely as possible to the historic color. (The original color may no longer be available.)
- Connect the historic core to the new Lower Campus by extending the natural concrete band into the design of its east-west pedestrian spine. Repeated bands of red and natural concrete will focus pedestrians' attention on this path and clarify direction through campus.

LEGEND

- COLORED CONCRETE
- NATURAL CONCRETE
- CONCRETE PAVERS
- REINFORCED GRASS PAVER SYSTEM

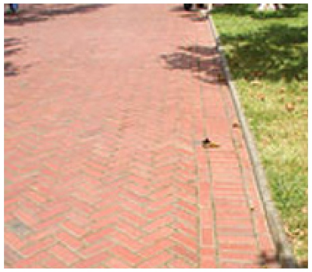
NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	NOT USED
18	NOT USED
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

HARDSCAPE GUIDELINES


COLORED CONCRETE GRID PATTERN AT HISTORIC CORE OF CRAFTON HILLS COLLEGE


COLORED PAVING BANDS: UC SAN DIEGO CAMPUS WALK


EXAMPLE OF PAVER UNIT: RED COLOR, BASKETWEAVE PATTERN


EXAMPLE OF PAVER IN RED COLOR, HERRINGBONE PATTERN


REINFORCED GRASS UNIT SYSTEM


"GRASSCRETE" STRUCTURAL SYSTEM

- Repeated use of the concrete paving bands in each of the campus clusters will clarify and unify the main pedestrian paths on campus.
- Emphasize major activity areas with the use of modular paver units. Paver patterns can vary according to the distinct quality desired for the space. Color selections, however, should stay within earthtone colors and primarily within the red and buff hues.

- Use reinforced grass unit systems (such as "grasscrete") at the OE Quad and along the OE fire lane. The system will visually extend the green expanse of OE Quad lawn while allowing the fire department and other emergency service vehicles to drive on the grass unit system.

SITE FURNISHING GUIDELINES

	Description	Location	Color/Finish
	CONCRETE BENCH BY WAUSAU TILE, MODEL TF5030	ALONG MAJOR PEDESTRIAN WALKWAYS CENTRAL QUAD	NATURAL CONCRETE
  	"CATENA" PEDESTAL TABLE: CUSTOM SIZE OF 60" DIA. TOP WITH CUSTOM PEDESTAL BASE AND UMBRELLA STAND HOLE "TRAVERSE" STACKABLE CHAIRS WITH PERFORATED METAL SEAT "EQUINOX" UMBRELLA, 8 FT. DIA. ALL PRODUCTS BY LANDSCAPE FORMS	STUDENT CENTER FOOD COURT STUDY AREAS WITHIN CAMPUS CLUSTERS	"CATENA" TABLE TOP: SOLID POWDERCOATED STEEL, COLOR: SILVER, OLIVE OR STONE "TRAVERSE" CHAIR, POWDERCOATED STEEL. COLOR: SEE TABLE TOP COLORS UMBRELLA: SUNBRELLA FABRIC TO MATCH TABLE
 	WASTE RECEPTACLES: METAL: "SCARBOROUGH" BY LANDSCAPE FORMS. 30-GAL. CAPACITY, SIDE OPENING CONCRETE: WAUSAU TILE, MODEL TF1224, 31-GAL. CAPACITY	LOCATE METAL RECEPTACLES WHERE METAL SITE FURNITURE IS LOCATED LOCATE CONCRETE RECEPTACLES WITH CONCRETE BENCHES	METAL RECEPTACLE: POWDERCOATED, COLOR: MATCH "CATENA" TABLES & "TRAVERSE" CHAIRS CONCRETE WASTE & RECYCLE RECEPTACLES. COLOR: NATURAL CONCRETE
 	BUILT-IN SEAT WALLS AND TABLES	AT "THE LIVING WALL" OVERLOOK WALLS AS PART OF RAISED PLANTERS	COLOR: MATCH CONCRETE WALLS

LIGHTING

A CAMPUS ENTRY LIGHTING

B STREET LIGHTING
PARKING LOT LIGHTING

C CAMPUS LIGHTING
BOLLARDS
POLE TOP FIXTURES
STEP LIGHTS

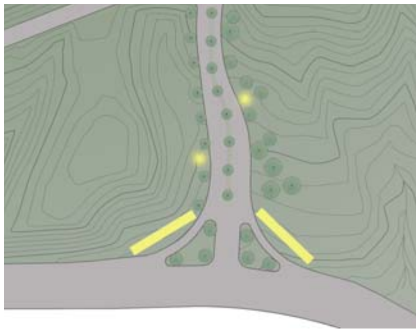
D MOONLIGHTING

E BUILDING FACADE LIGHTING

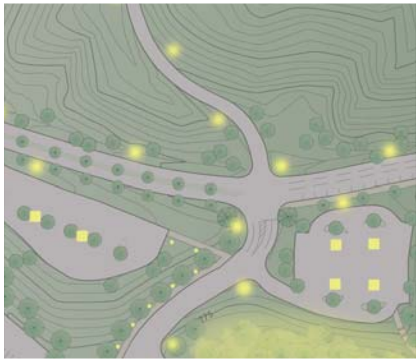
F BUILDING ENTRY LIGHTING

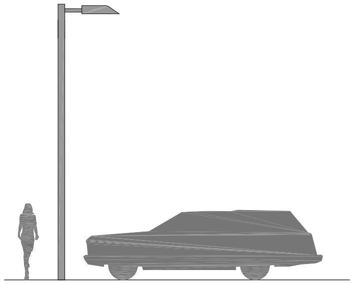
LIGHTING

A CAMPUS ENTRY LIGHTING



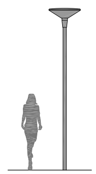
B STREET/ PARKING LOT LIGHTING

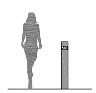




LIGHTING

C CAMPUS LIGHTING

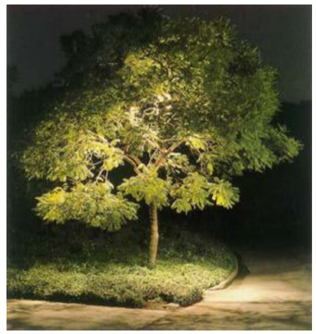





LIGHTING

D MOONLIGHTING



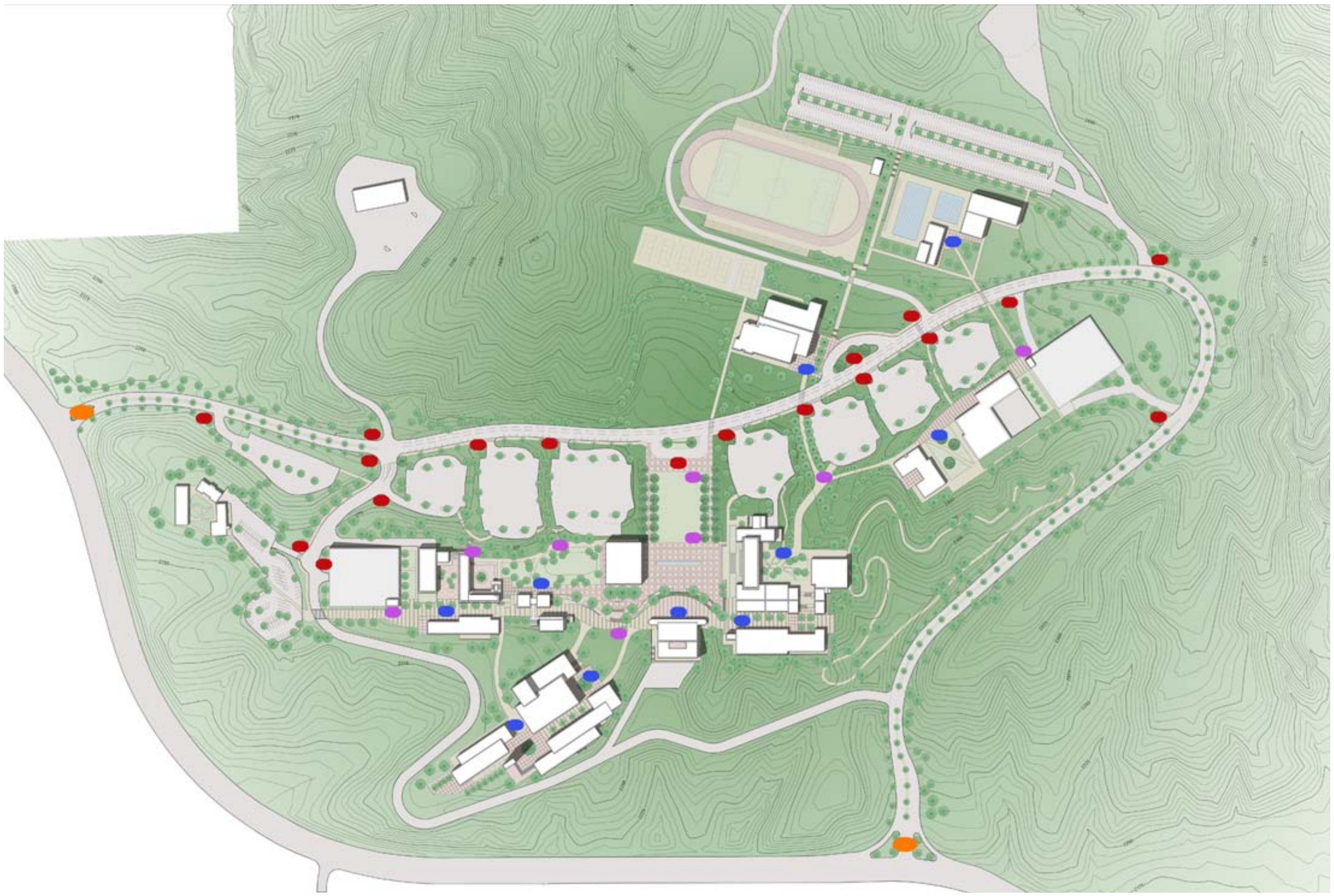
E BUILDING FACADE LIGHTING

LIGHTING

F BUILDING ENTRY LIGHTING



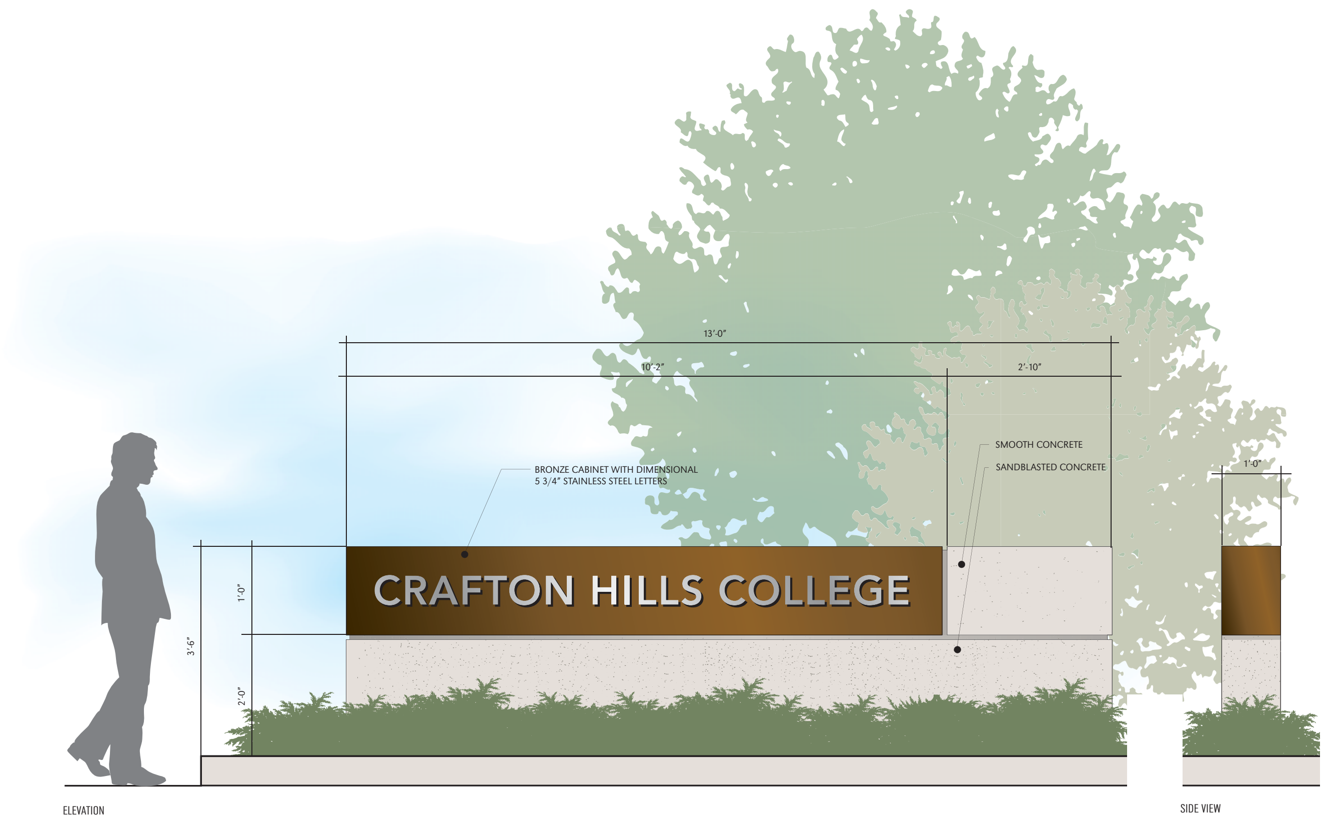

SIGNAGE



- CAMPUS ID MONUMENT
- PARKING LOT ID SIGN
- CAMPUS DIRECTORY/ DIRECTIONAL SIGN
- CLUSTER DIRECTORY SIGN

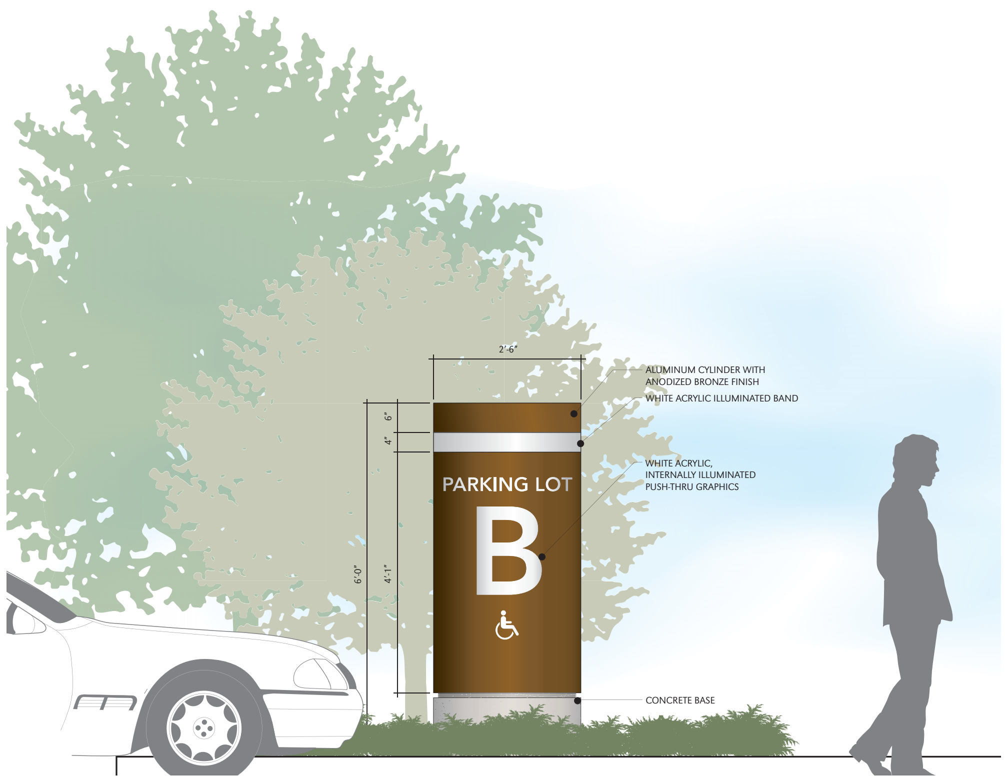
SIGNAGE

CAMPUS ID MONUMENT

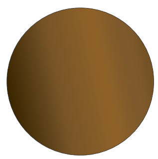


SIGNAGE

PARKING LOT ID SIGN



ELEVATION

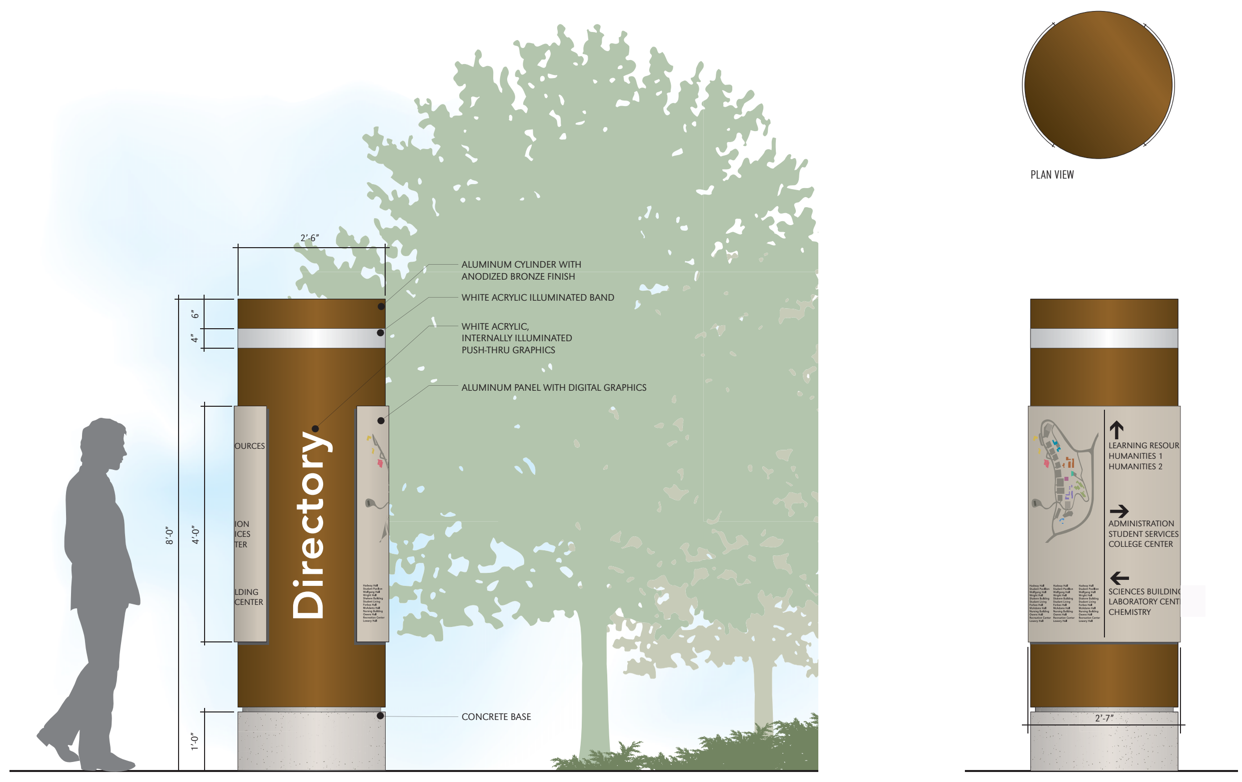


PLAN VIEW

SIDE VIEW

SIGNAGE

CAMPUS DIRECTORY/ DIRECTIONAL SIGN

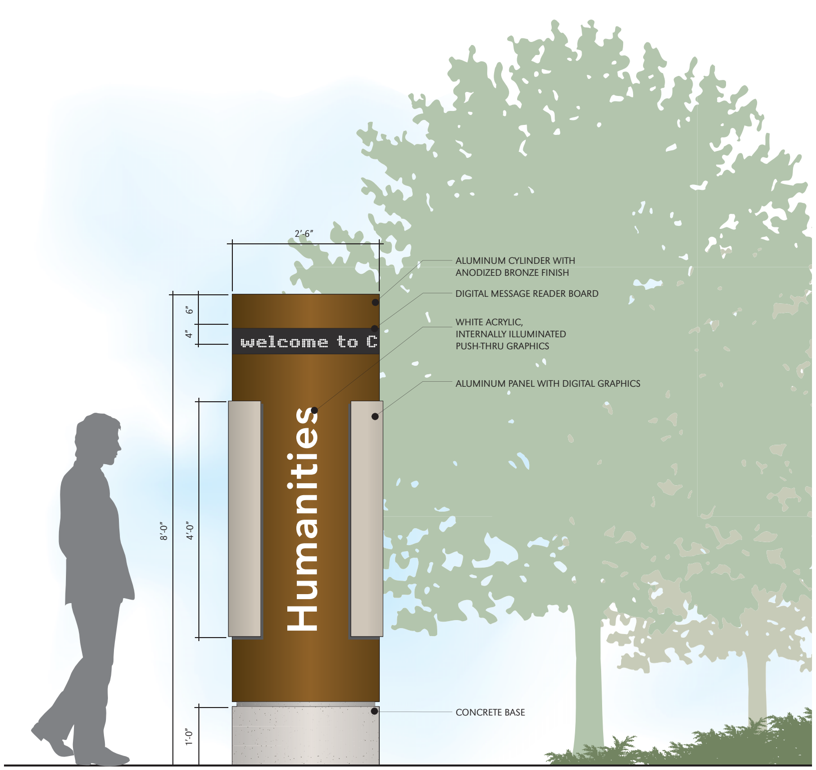


ELEVATION

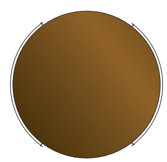
SIDE VIEW

SIGNAGE

CLUSTER DIRECTORY SIGN



ELEVATION

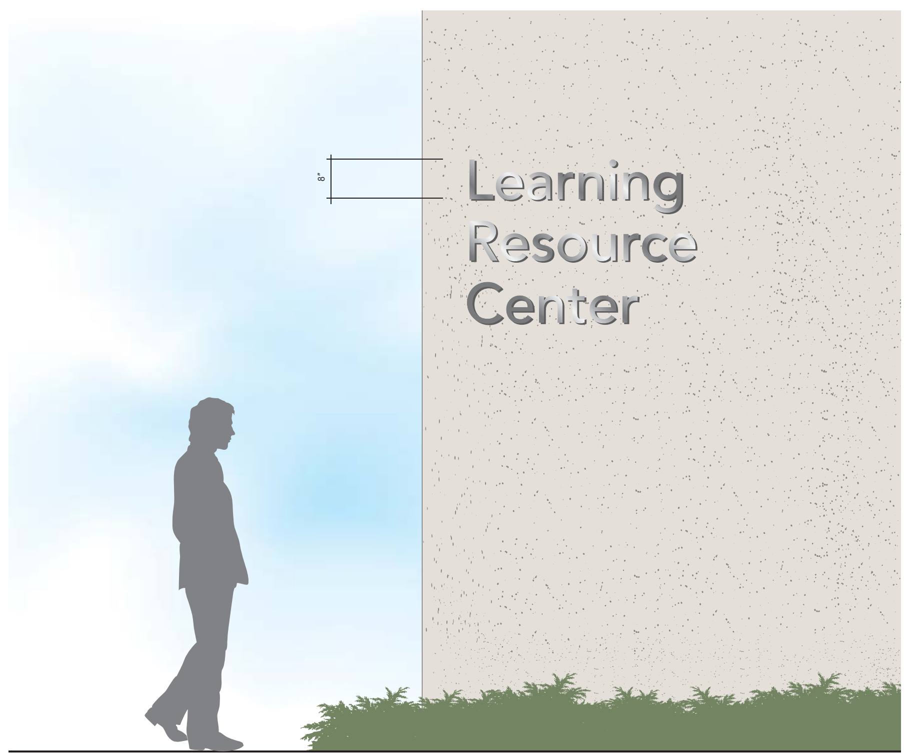


PLAN VIEW

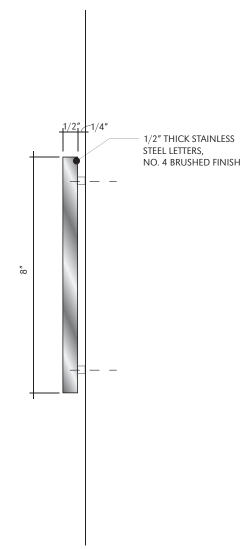
SIDE VIEW

SIGNAGE

BUILDING IDENTIFICATION



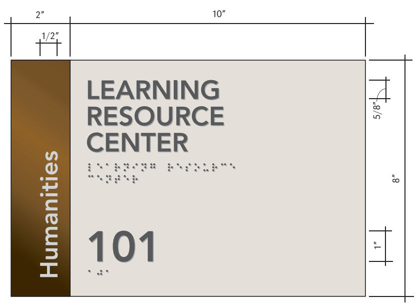
ELEVATION



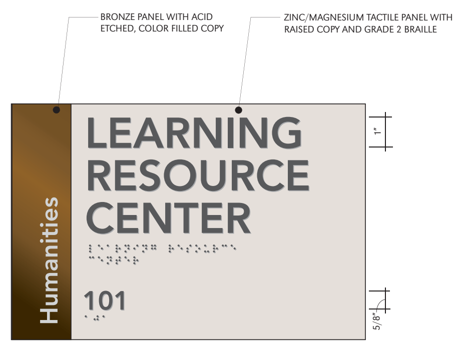
SIDE DETAIL

SIGNAGE

ROOM IDENTIFICATION SIGNS



INTERIOR SIGN

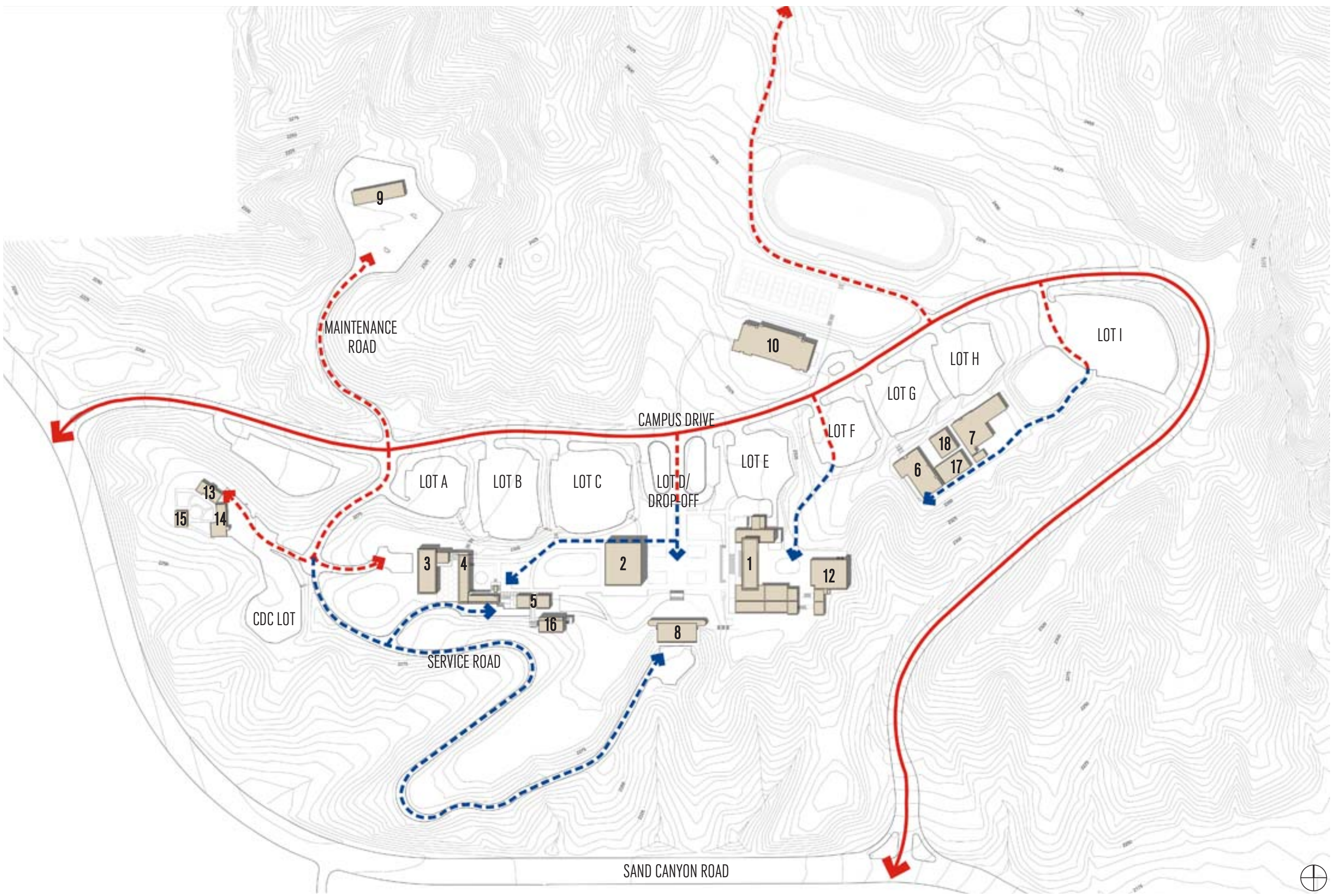


EXTERIOR SIGN

ELEVATION

5 | SITE INFRASTRUCTURE

FIRE ACCESS | EXISTING



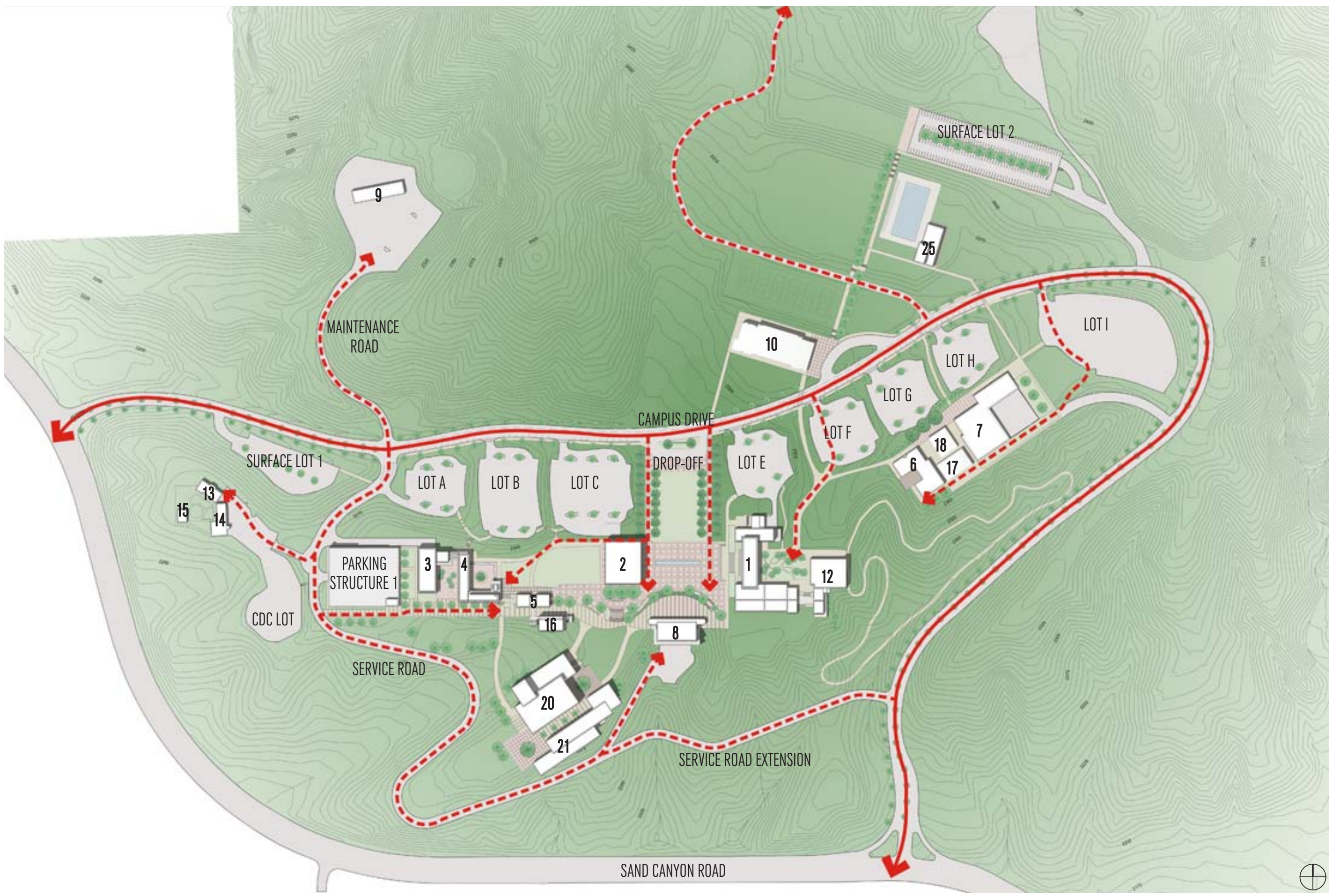
The main acess route along Campus Drive is fully code compliant and easily navigable. There are secondary access routes into portions of campus, but not all of these comply with current code standards.

LEGEND

- MAIN ACCESS ROUTE
- SECONDARY ACCESS ROUTE: COMPLIANT
- SECONDARY ACCESS ROUTE: NON-COMPLIANT

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

FIRE ACCESS | 2012



Emergency access routes throughout the campus have been identified. Existing routes will be improved and new ones developed that conform to the requirements of the California Building Code. Each proposed construction project must be approved and reviewed individually for Fire Department site access and hydrant compliance.

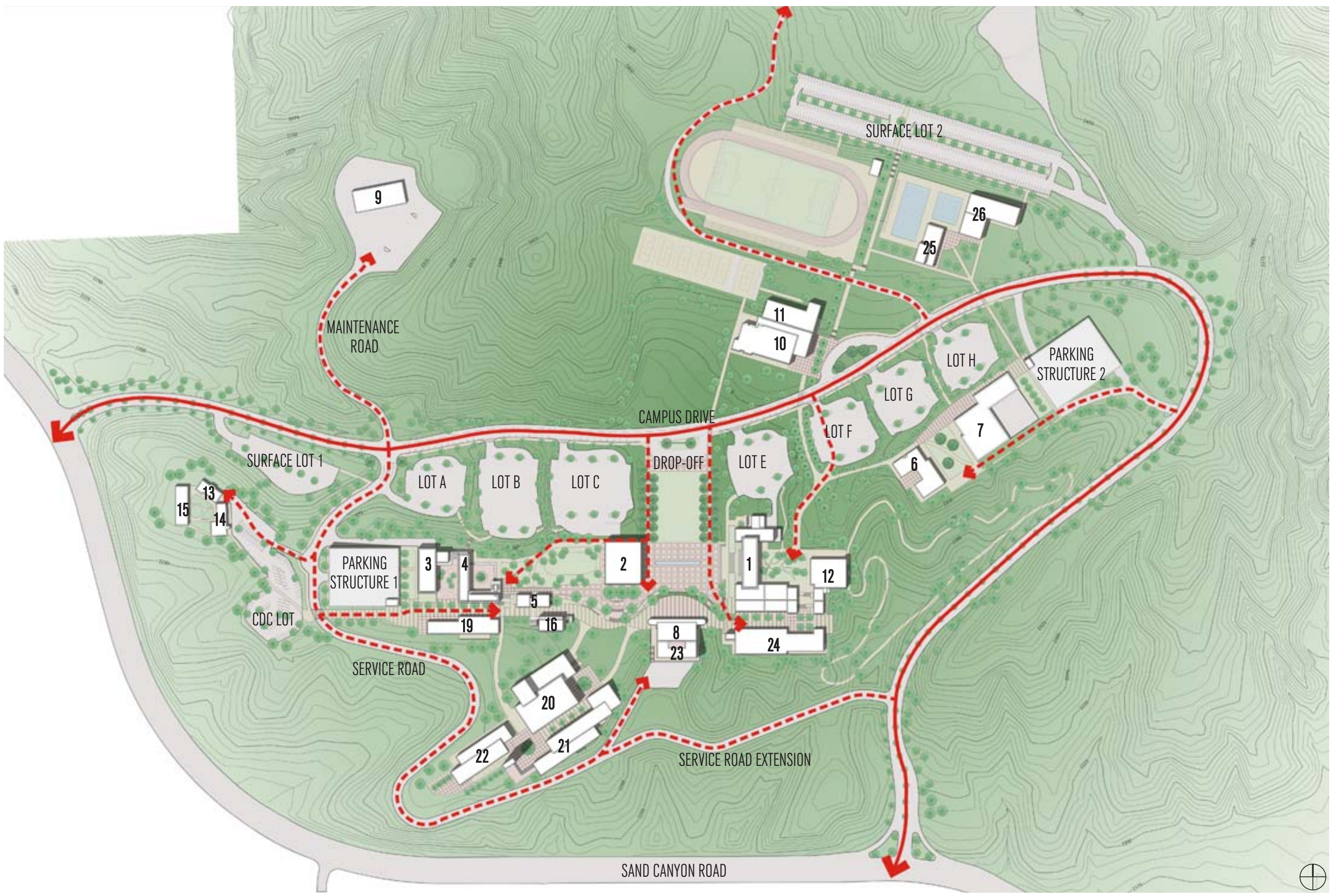
Emergency access roads will also serve as secondary service access routes through the campus.

LEGEND

- MAIN ACCESS ROUTE
- SECONDARY ACCESS ROUTE: COMPLIANT
- SECONDARY ACCESS ROUTE: NON-COMPLIANT

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	CLASSROOMS
18	CLASSROOMS
19	NOT USED
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	NOT USED
23	NOT USED
24	NOT USED
25	COMMUNITY RECREATIONAL FACILITY
26	NOT USED

FIRE ACCESS | 2025



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LEGEND

- MAIN ACCESS ROUTE
- SECONDARY ACCESS ROUTE: COMPLIANT
- SECONDARY ACCESS ROUTE: NON-COMPLIANT

NO.	BUILDING NAME
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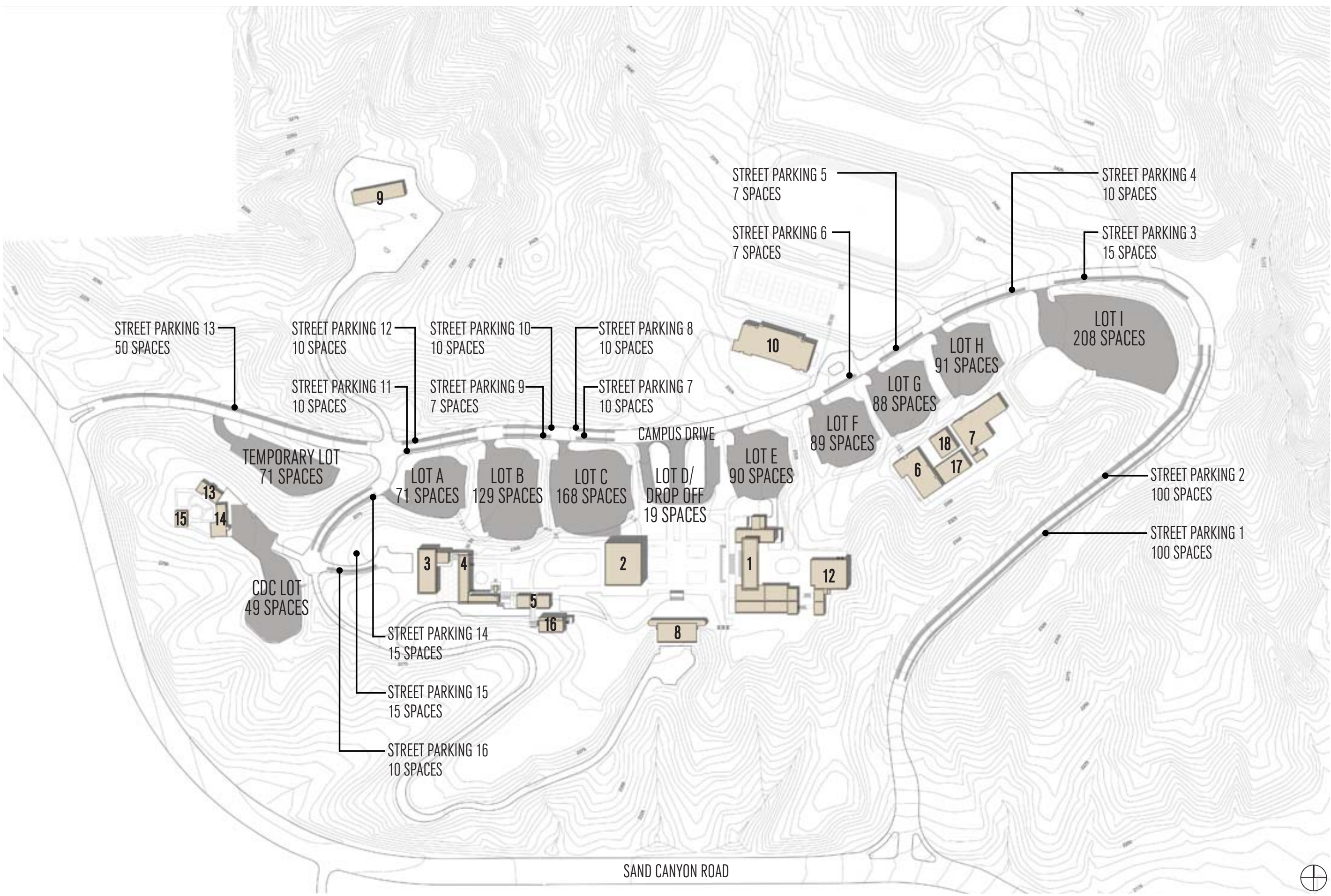
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	DEMOLISHED - CLASSROOMS
18	DEMOLISHED - CLASSROOMS
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

PARKING | EXISTING



EXISTING: 1,459 SPACES

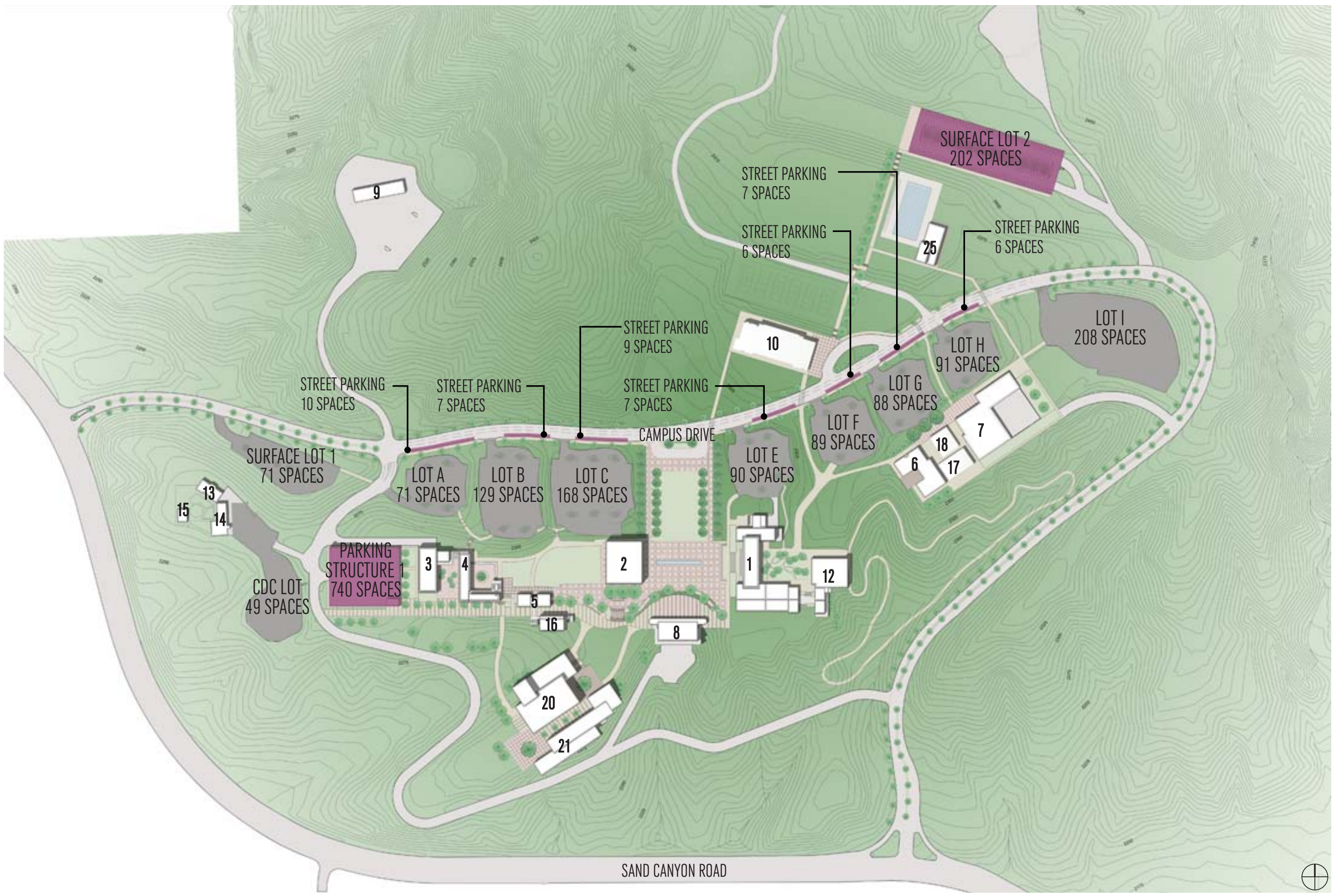
LEGEND

EXISTING PARKING

NEW/ RENOVATED PARKING

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	LEARNING RESOURCE CENTER/ LIBRARY
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	CLASSROOM BUILDING
6	OCCUPATIONAL EDUCATION 1
7	OCCUPATIONAL EDUCATION 2
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY/ HEALTH SCIENCES
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	BOOKSTORE
18	CLASSROOM AT BOOKSTORE

PARKING | 2012



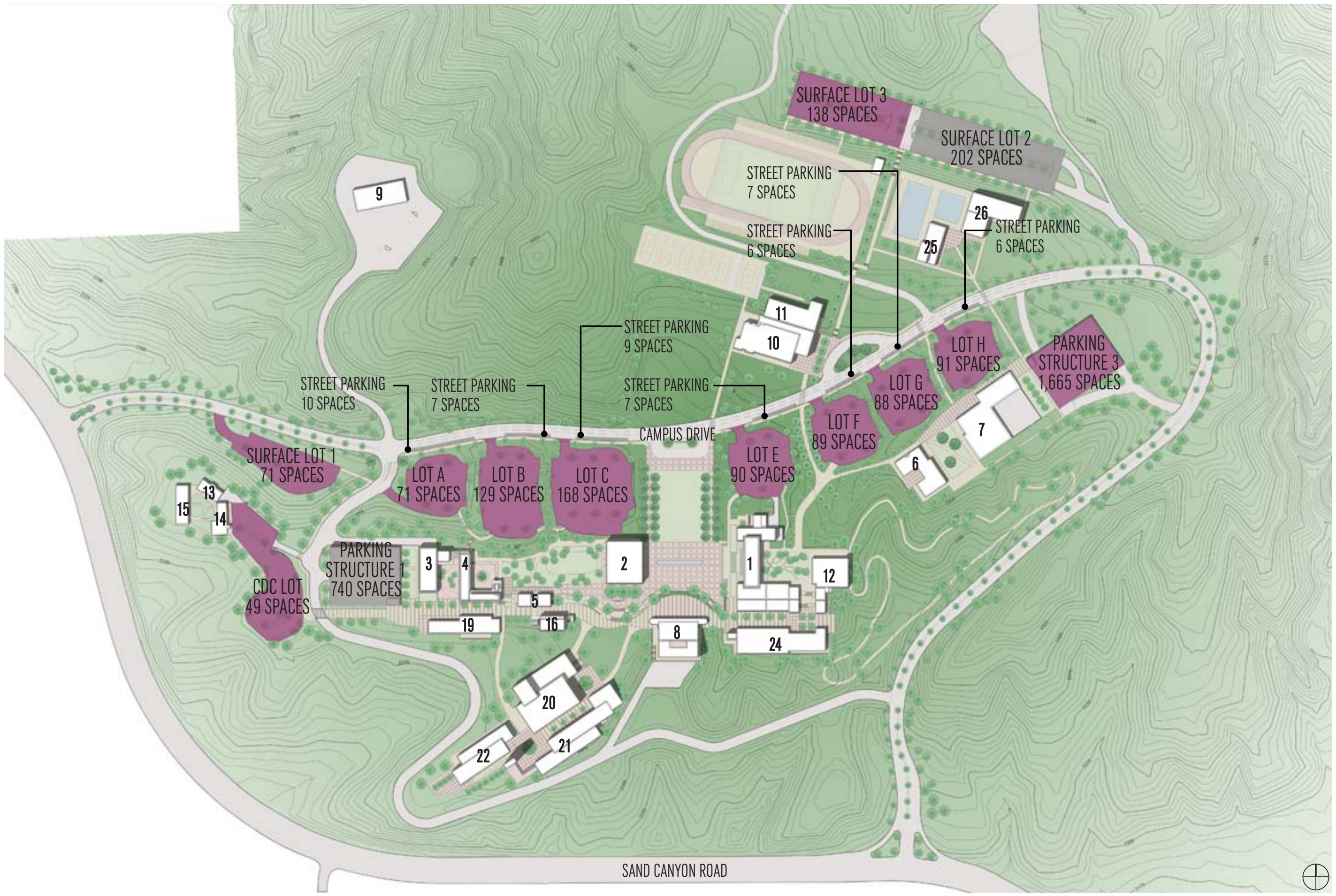
EXISTING:	1,054 SPACES
NEW/RENOVATED:	994 SPACES
TOTAL:	2,048 SPACES

LEGEND

- EXISTING PARKING
- NEW/ RENOVATED PARKING

NO.	BUILDING NAME
1	LABORATORY/ ADMINISTRATION
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	NOT USED
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER 3
16	STUDENT SERVICES B
17	CLASSROOMS
18	CLASSROOMS
19	NOT USED
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	NOT USED
23	NOT USED
24	NOT USED
25	COMMUNITY RECREATIONAL FACILITY
26	NOT USED

PARKING | 2025



EXISTING:	994 SPACES
NEW/RENOVATED:	1,665 SPACES
TOTAL:	3,643 SPACES

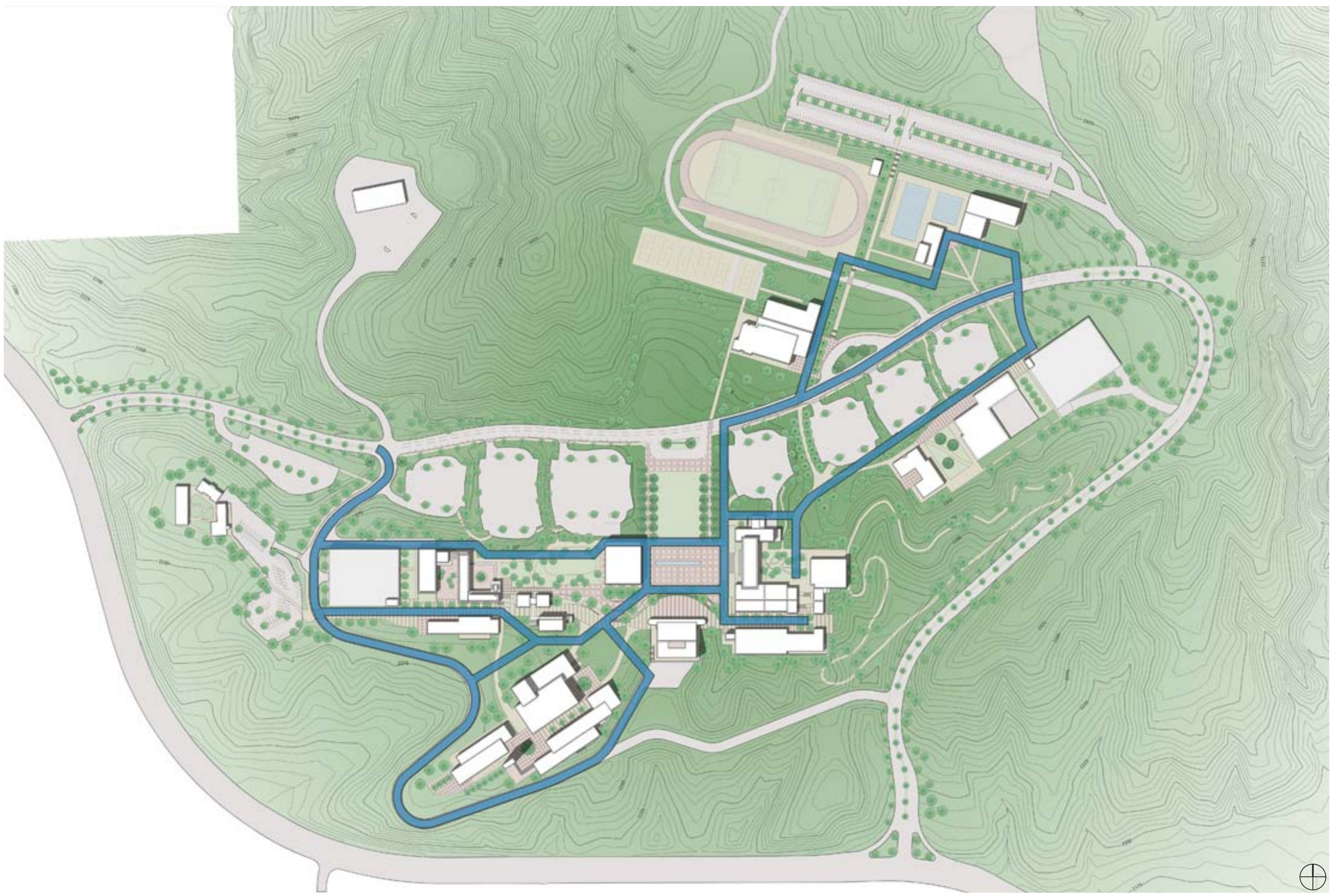
LEGEND

EXISTING PARKING

NEW/ RENOVATED PARKING

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	DEMOLISHED - CLASSROOMS
18	DEMOLISHED - CLASSROOMS
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

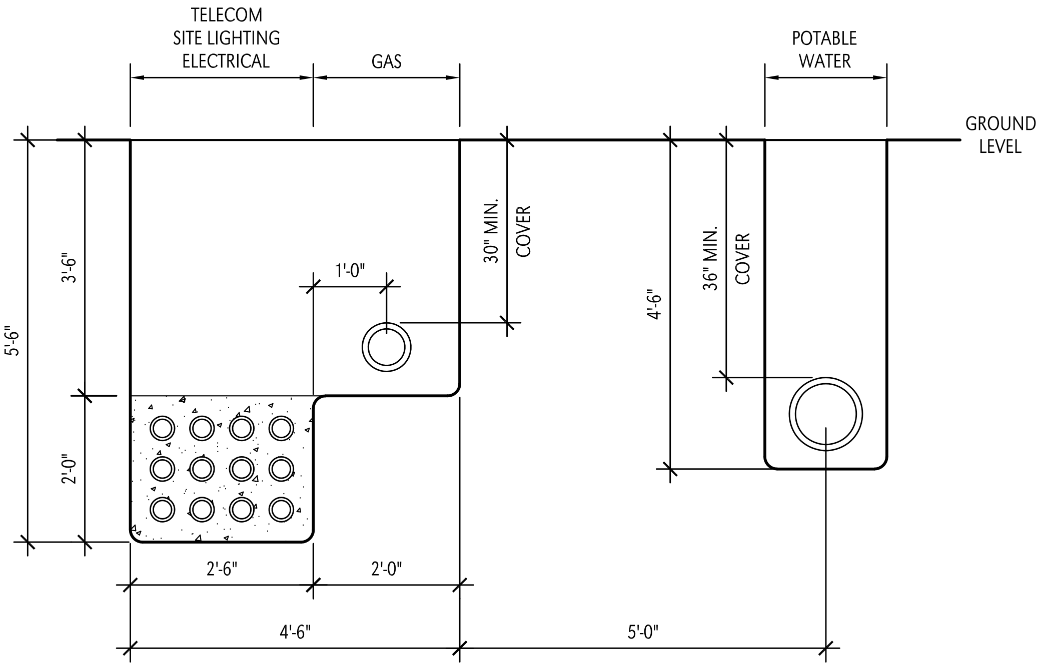
UTILITIES OVERVIEW | UTILITIES ROUTING



A series of utilities corridors and looping systems have been developed, expanding existing pathways and establishing new routes through campus. All major utilities constructed on campus will be located within these corridors.

NO.	BUILDING NAME
1	LABORATORY CENTER
2	STUDENT CENTER
3	COLLEGE CENTER
4	STUDENT SERVICES A
5	STUDENT SERVICES C
6	OCCUPATIONAL EDUCATION 1
7	EMERGENCY SERVICES
8	PERFORMING ARTS CENTER
9	MAINTENANCE & OPERATIONS
10	GYMNASIUM
11	WELLNESS CENTER
12	CHEMISTRY
13	CHILD DEVELOPMENT CENTER 1
14	CHILD DEVELOPMENT CENTER 2
15	CHILD DEVELOPMENT CENTER EXPANSION
16	STUDENT SERVICES B
17	DEMOLISHED - CLASSROOMS
18	DEMOLISHED - CLASSROOMS
19	ADMINISTRATION/ STUDENT SERVICES
20	LEARNING RESOURCE CENTER
21	HUMANITIES 1
22	HUMANITIES 2
23	PERFORMING ARTS CENTER EXPANSION
24	SCIENCES
25	COMMUNITY RECREATIONAL FACILITY
26	COMMUNITY CENTER

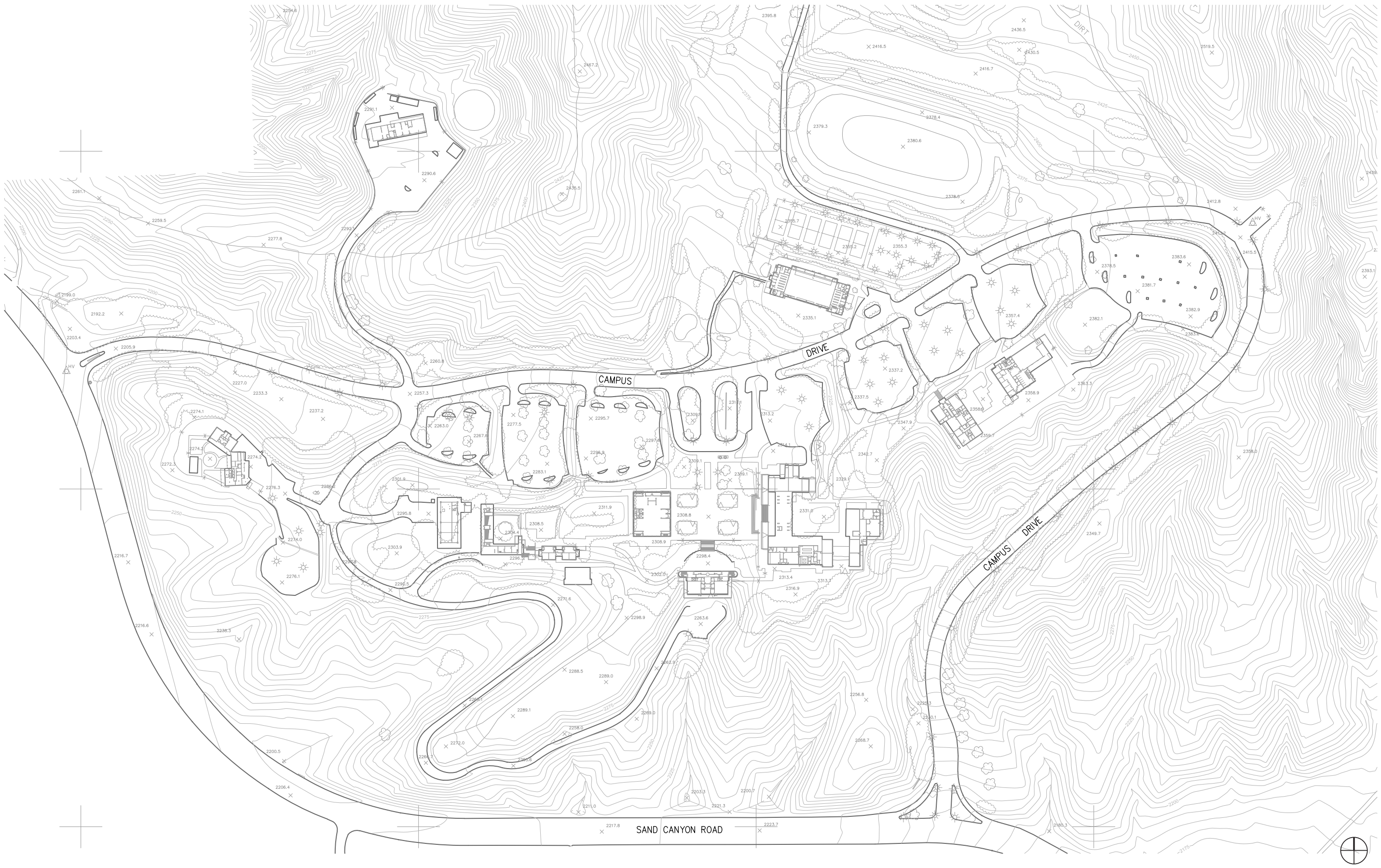
UTILITIES OVERVIEW | UTILITY TRENCH



NOT TO SCALE

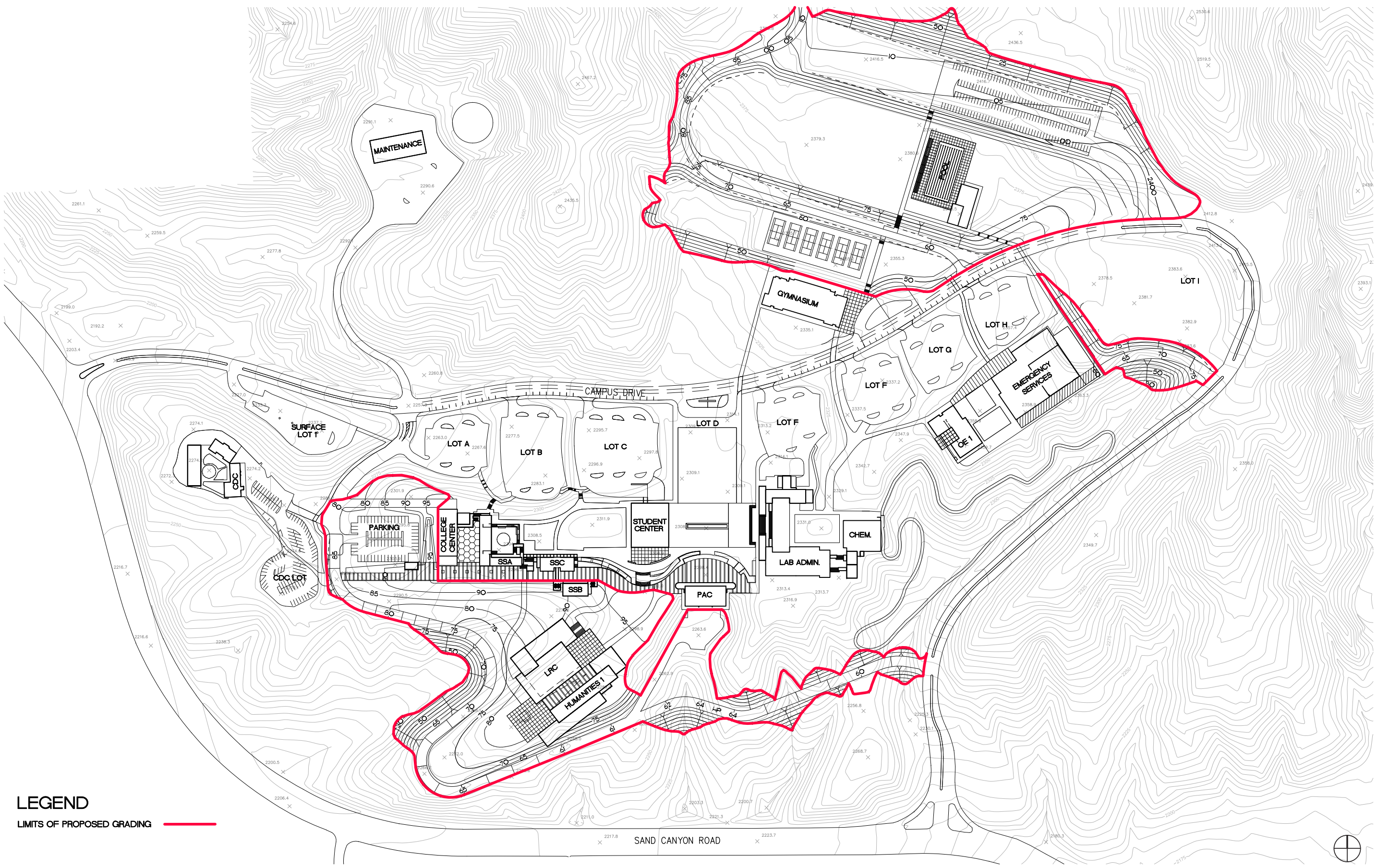
The trench diagram shows the layout and adjacencies of various utilities, as well as the minimum requirements for their ground cover and separation from one another.

SITE GRADING | EXISTING



The existing grading diagram shows the campus topography as it is today.

SITE GRADING | 2012



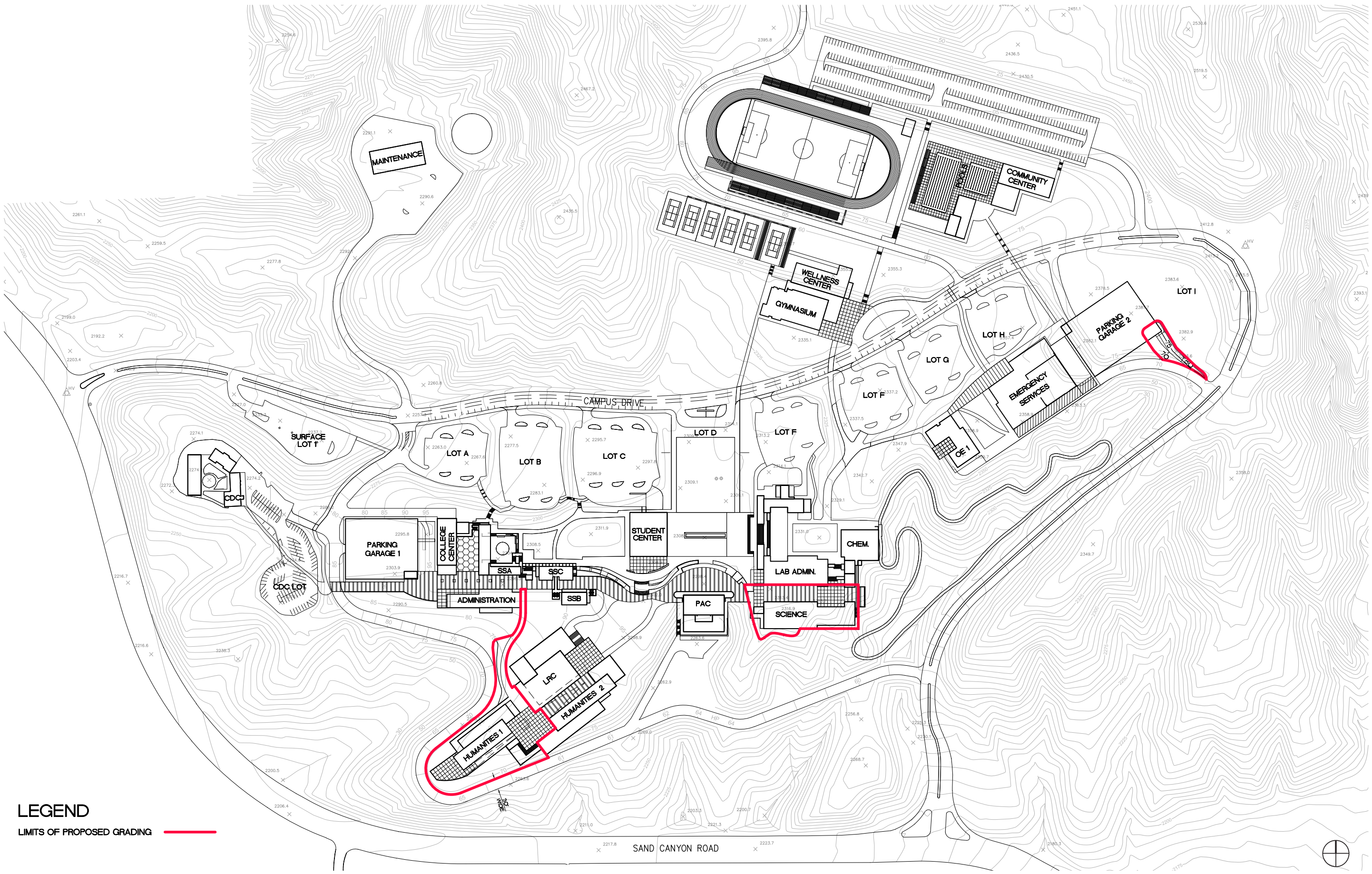
Site grading proposed with the 2012 Master Plan includes the grading of the surface parking lot at the location of Parking Structure 1, the mass grading of the Learning Resource Center/Humanities site, the development of the southerly perimeter road alignment, the grading of the rear access road for the Occupational Education Building 2, and the mass grading for the Aquatics Center and future athletic fields.

Grading for the surface parking lot at the location of future Parking Structure 1 generates export material that will be utilized in grading the building pad for the proposed Learning Resource Center/Humanities site. Grading of the Learning Resource Center/Humanities site requires approximately 65,000 cubic yards of material to be excavated and placed in embankment. The extension of the southerly perimeter road east of the Performing Arts parking lot requires approximately 6,000 cubic yards of excavation and embankment.

The grading of the access road to the proposed Occupational Educational Building 2 requires approximately 10,000 cubic feet of excavation and embankment.

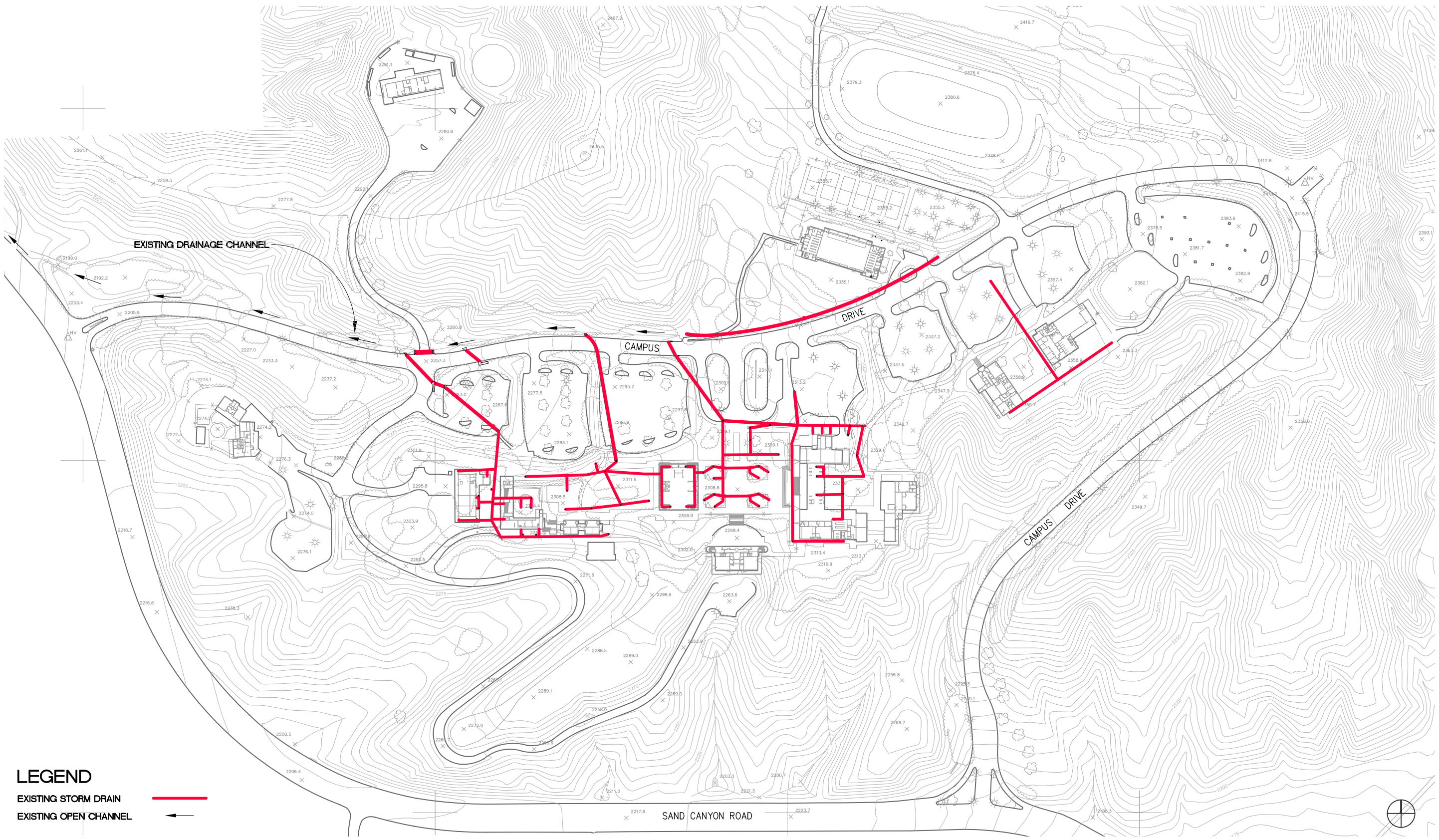
The grading for the Aquatics Center generates substantially greater quantities of excavation than embankment. In order to balance the grading of this area, the entire Aquatics Center and future athletic field and tennis court site will be graded simultaneously. Grading of this site includes approximately 120,000 cubic yards of excavation and embankment. Grading of the site will include the realignment of the access road, easement, and water transmission main for the City of Redlands reservoir located northeasterly of the proposed Aquatics Center.

SITE GRADING | 2025



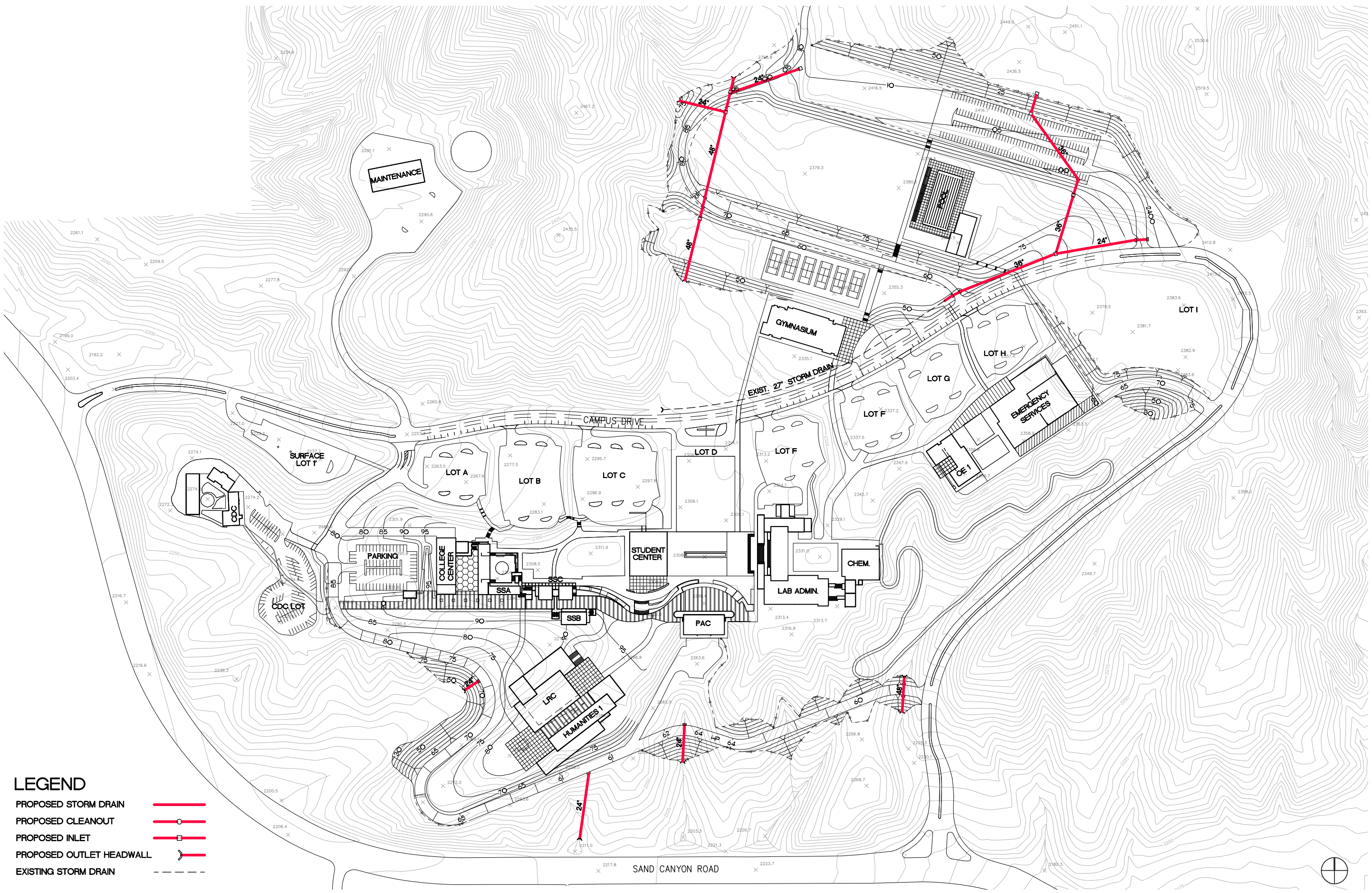
Grading for the majority of the proposed 2025 Master Plan sites is completed in the 2012 Master Plan. The only significant site grading with the 2025 plan will be pad excavation for the proposed Science Building. Excavation of the building pad should balance with the embankment behind the proposed site retaining walls. Grading for the site will be approximately 5,000 cubic yards of excavation and embankment.

STORM DRAINAGE | EXISTING



Site storm drainage consists of a system of surface flow to catch basins and inlets, conveyance through small diameter pipes, connecting to larger diameter storm drains and discharging to an open channel located along the northerly side of Campus Drive. The open channel discharges to a retention pond located in the vicinity of Campus Drive and Sand Canyon Road. Drainage flows from the pond, offsite in a natural swale running northwesterly along Sand Canyon Road.

STORM DRAINAGE | 2012

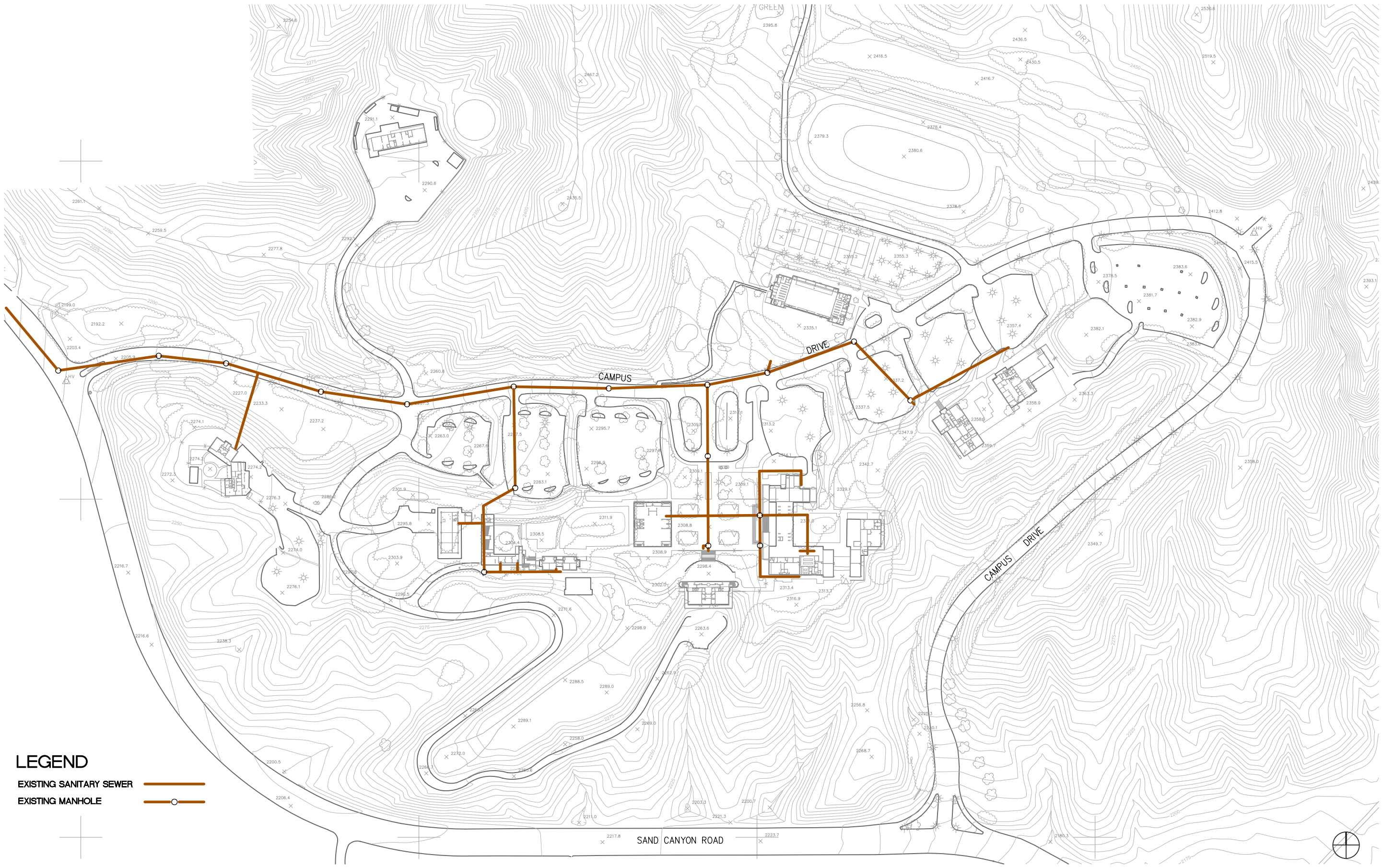


The grading of the Aquatics Complex will necessitate the development of a storm drain system to convey surface drainage from the northeasterly portion of campus through the proposed site development, discharging to the existing drainage swale located along the northerly side of campus Drive.

The development of the Learning Resource Center/Humanities Complex in conjunction with the perimeter road will require the installation of catch basins, slope drains, and culverts.

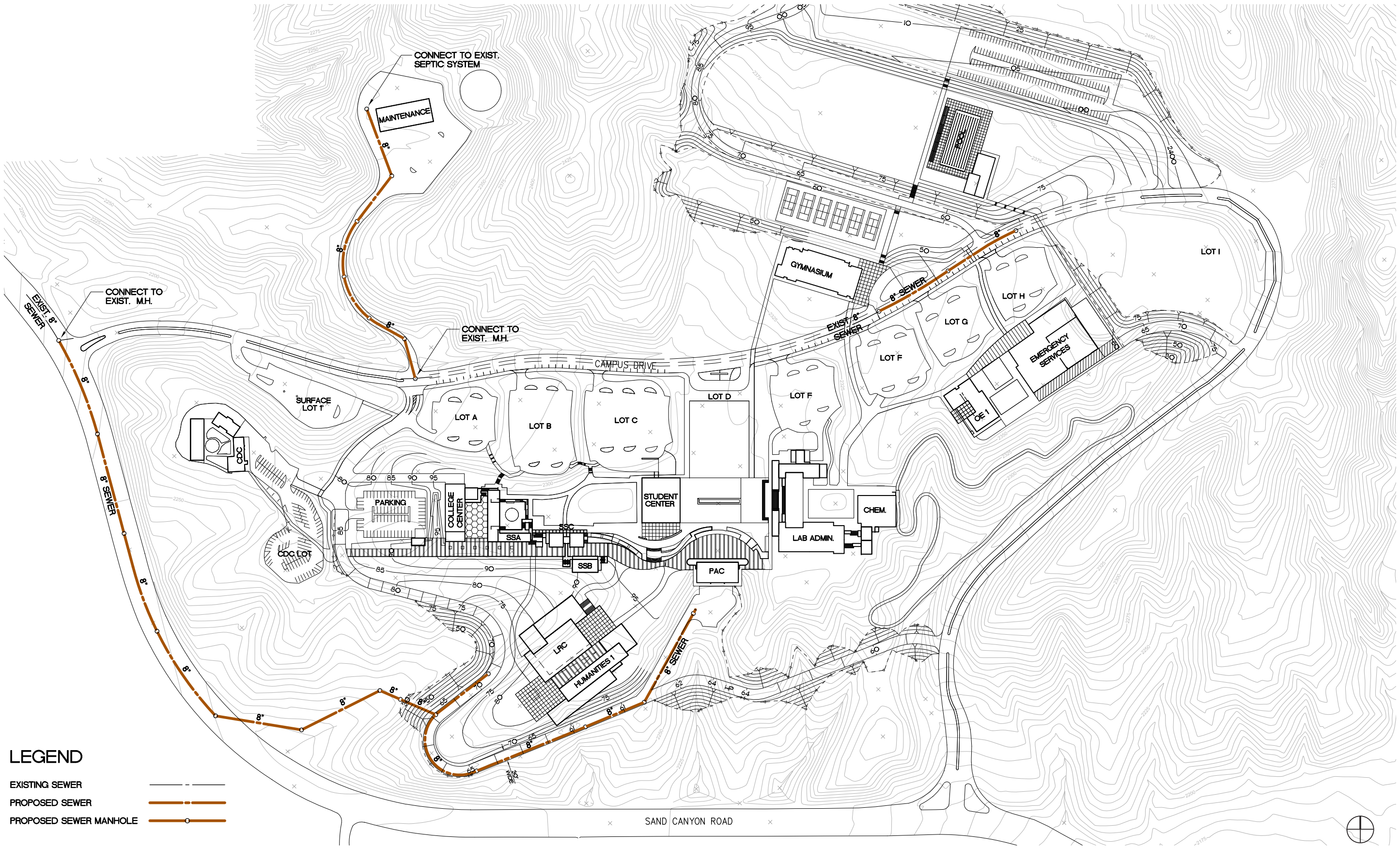
Site drainage for 2025 will be completed in the 2012 period.

SANITARY SEWER | EXISTING



The site sanitary sewer system consists of building waste lines connecting to site sewers at cleanouts located adjacent to the buildings. Site sewers consisting of gravity flow 6" and 8" pipes, cleanouts, and manholes convey the sewage to the campus trunk line located in Campus Drive. The trunk line flows westerly in Campus Drive, connecting to the City of Redlands sanitary sewer located in Sand Canyon Road.

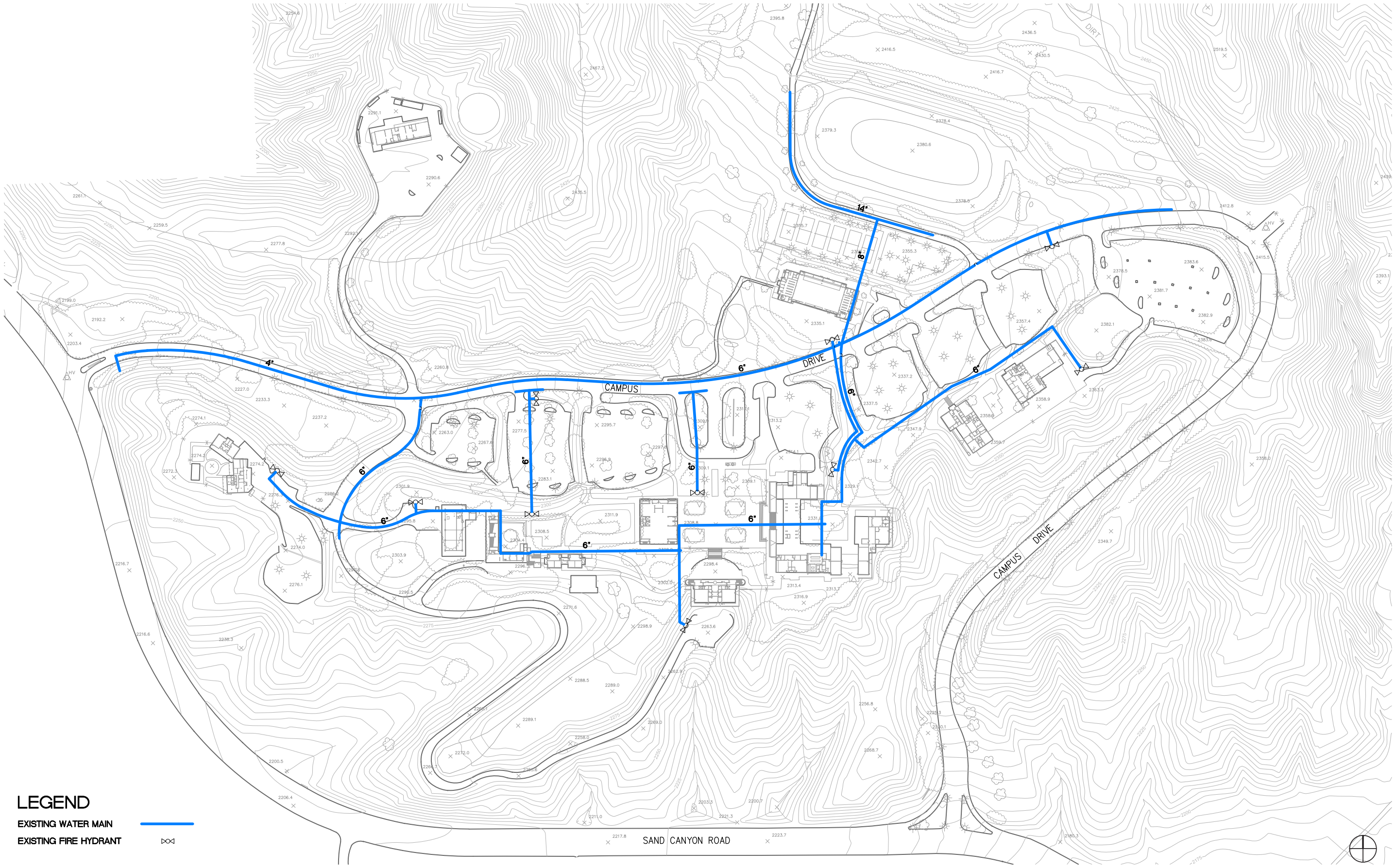
SANITARY SEWER | 2012



The development of the southerly side of campus necessitates the installation of a sanitary sewer to gravity serve the proposed Learning Resource Center/Humanities Complex. The main will be extended to provide gravity sewer to the existing Performing Arts Building and the proposed 2025 Science Building. The main will be connected to the City of Redlands sewer main located at the westerly intersection of Campus Drive and Sand Canyon Road. The main will extend southeasterly in Sand Canyon Road to the southerly end of the LRC/Humanities complex.

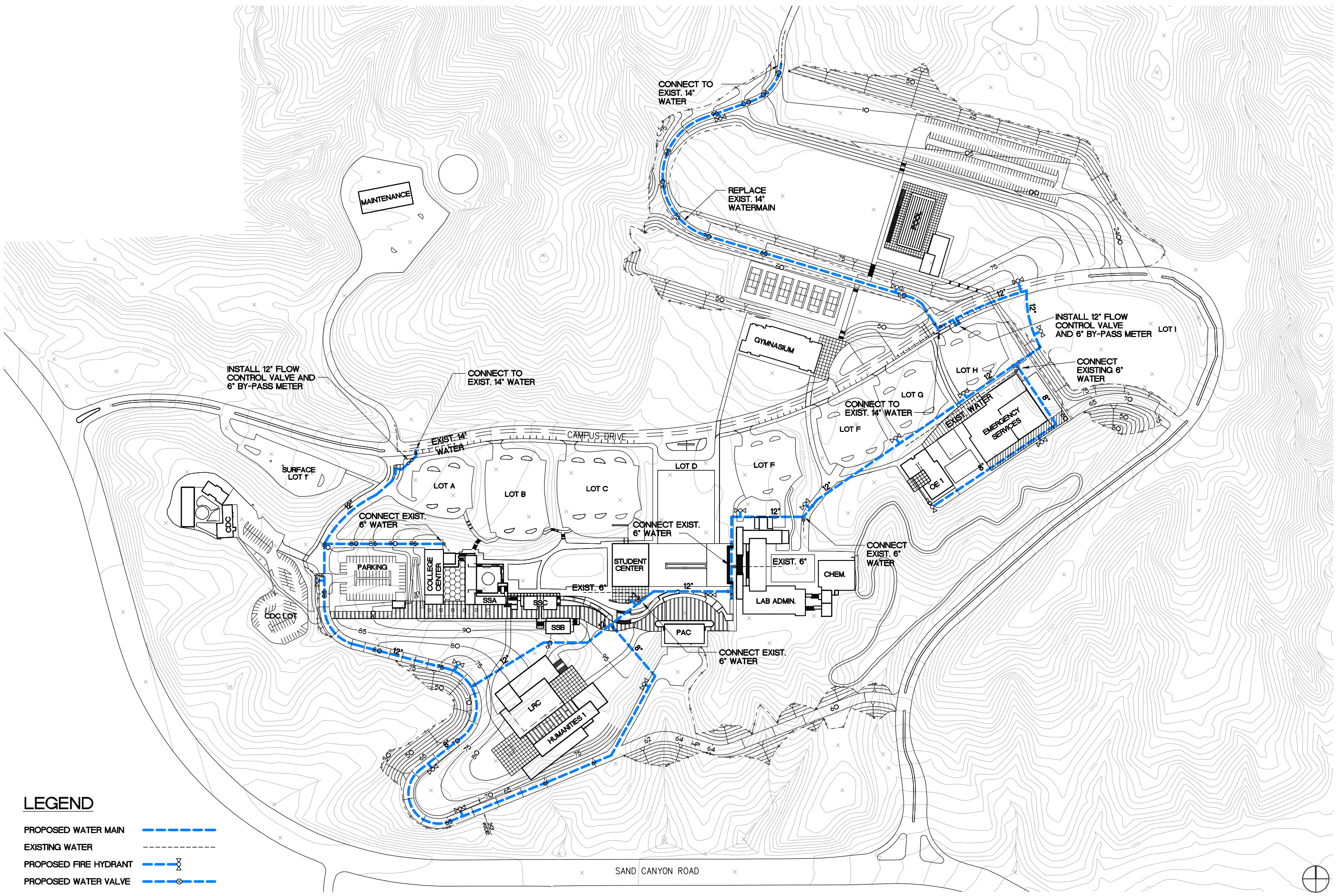
The existing sanitary sewer located in Campus Drive will require extension easterly from the vicinity of the Gymnasium approximately 450 feet to serve the proposed aquatics complex.

WATER DISTRIBUTION & FIRE PROTECTION | EXISTING



The site water distribution system consists of potable water supplied by the City of Redlands Water Department. The City supplies water to the campus through a system of transmission mains, regulating reservoirs, and a pumping station. The City water main located in Sand Canyon Road extends onto campus easterly in Campus Drive and northerly to a regulating reservoir locate adjacent to the campus Maintenance and Receiving facility. Water from the reservoir is pumped through a transmission main located in Campus Drive, easterly and northerly to a second regulating reservoir located at a higher elevation in the northeasterly portion of campus. Water and fire protection water are provided to campus facilities from the transmission main. Fire hydrants located along Campus Drive and several hydrants located near the campus buildings are serviced from the transmission main.

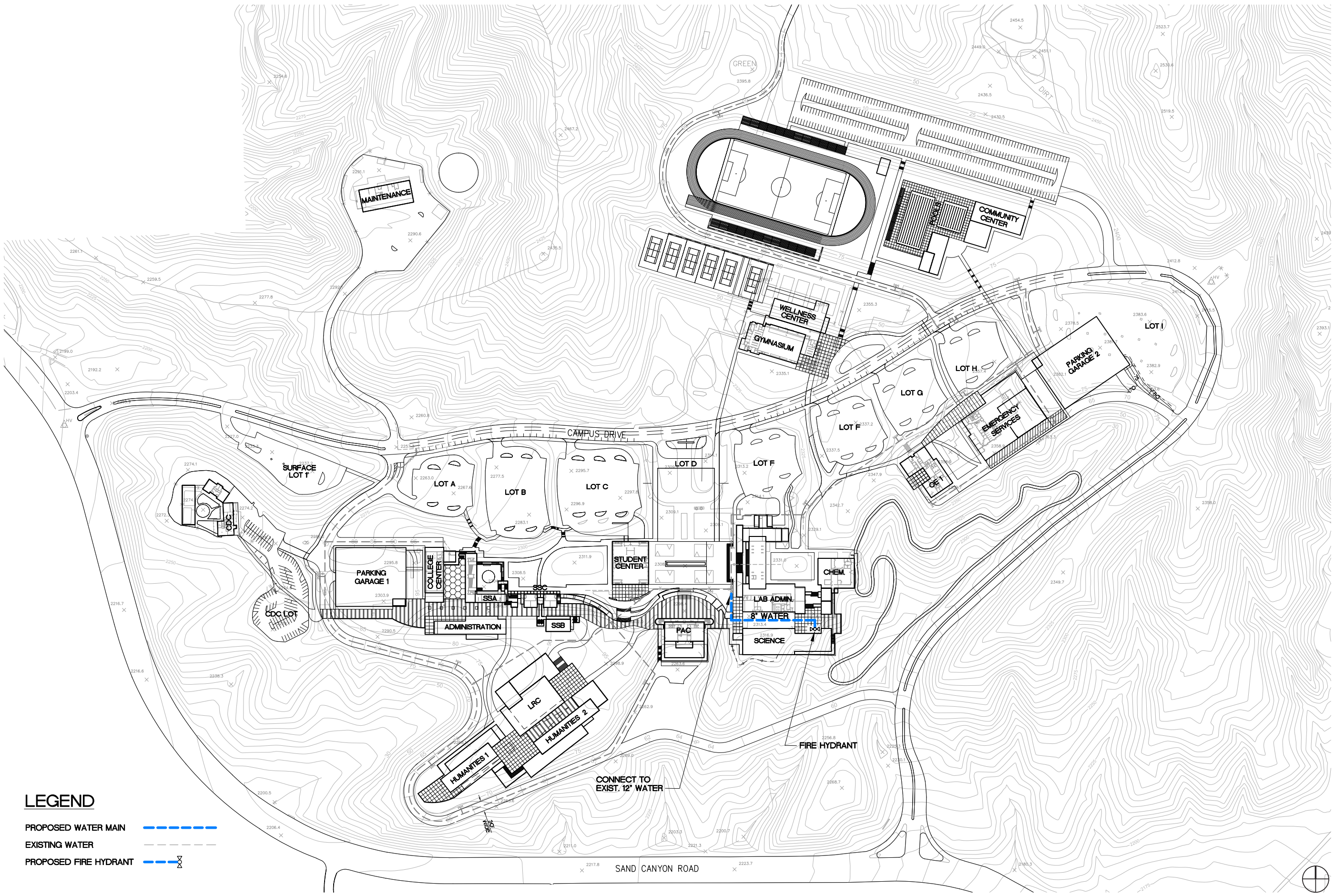
WATER DISTRIBUTION & FIRE PROTECTION | 2012



The current water distribution system is undersized to provide adequate fire protection to the campus. A twelve inch watermain located within the proposed utility corridor will connect to the City of Redlands transmission main located in Campus Drive in the vicinity of Parking Lot A and at the intersection of the reservoir access road and Campus Drive. The twelve inch main will connect to the existing campus water distribution system at several locations, providing improved flow. Fire hydrants connected to the twelve inch main will be located at appropriate intervals as prescribed by the local Fire Authority. An eight inch loop will be included in the perimeter access road to provide fire protection along the southerly side of the LRC/Humanities Buildings. Additionally, an eight inch main will be installed along the easterly and southerly sides of the Occupational Educational Building 2 for the installation of fire hydrants.

The grading of the Aquatics Center and future athletic field with the 2012 Master Plan will necessitate the realignment of the access road to the City of Redlands reservoir located in the northeasterly portion of the campus. In conjunction with the road realignment, the existing fourteen inch watermain located within the road must be relocated.

WATER DISTRIBUTION & FIRE PROTECTION | 2025



An eight inch watermain extension will be required to serve the proposed Science Building. Fire hydrants will be connected to the main to provide protection for the proposed structure.

MECHANICAL SYSTEMS

CAMPUS WIDE HVAC SYSTEM SUMMARY - EXISTING SYSTEMS OVERVIEW

1. Chilled Water Systems

The campus has three existing chiller central plants, which provide the cooling requirements of the existing campus buildings:

- The chiller central plant at the Gymnasium consists of (1) one Trane 30-ton and (1) one Trane 70-ton scroll compressor chillers.
- The chiller central plant at the Laboratory/Administration Building consists of (2) two Trane 200-ton centrifugal chillers. In addition to serving this building this central plant also serves the Occupational Education Building No.1 and the Performing Arts Center.
- The Student Services Building (SSA) chiller central plant consists of one 75-ton Trane centrifugal chiller (reciprocating chiller conversion by Siemens), (1) one 90-ton Trane hermetic rotary screw compressor chiller and one 35-ton Carrier reciprocating chiller.

The existing Child Development Center Buildings #1 and 2, Bookstore, Classrooms at the Bookstore and the Maintenance Building are provided with the unitary packaged or split units and will not be converted to the chilled water.

The energy conservation project conducted by Siemens Building Technologies (under the Performance Contracting Agreement in 2005) included a number of the chiller plant upgrades:

- Converting of the constant volume chilled water distribution system to a primary/secondary chilled water distribution system. The secondary loop provides variable chilled water flow.
- Replacement of the 3-way control valves with the 2-way control valves.
- Interconnecting of the Laboratory/Administration Building and SSA central plants into common chilled water system loop through underground piping.
- Converting the 75-ton reciprocating chiller in the SSA building to a centrifugal chiller.
- Inspection of all existing chillers.

The total installed cooling capacity of the Laboratory/Administration and the SSA central plants is approximately 700 nominal tons.

The chiller plant at the Gymnasium building is stand-alone and provides cooling for the Gymnasium building only.

The existing underground chilled water piping throughout the campus is in poor condition due to severe corrosion. According to the campus maintenance department staff, due to the numerous leaks in the piping it requires extensive time-consuming repairs. A sample of the pipe highlighting the pipe condition is stored at the campus maintenance facility.

2. Heating Water Systems

Several existing heating hot water boilers are installed on campus to accommodate the heating requirements of the campus buildings. The boiler systems are as follows:

- The boiler central plant at the Gymnasium consists of (2) two 1,600,000 btu/hr input (1,280,000btu/hr output) heating hot water boilers. These boilers serve only the Gymnasium building.
- The boiler central plant at the Laboratory/Administration Building consists of (2) two 990,000 btu/hr input (815,000btu/hr output) heating hot water boilers. In addition to serving the Laboratory/Administration Building this heating hot water central plant serves the Library Building, the Chemistry Building and the Performing Arts Center.
- The boiler central plant at the Student Services Building (SSA) consists of (2) two 1,500,000 btu/hr input (1,253,000btu/hr output) heating hot water boilers. This heating hot water central plant serves buildings SSA, SSB, SSC and the College Center.
- A heating water boiler with 625,000 btu/hr input (502,000 btu/hr output) provides heating hot water for the Occupational Education Building No.1.

The energy conservation project performed by Siemens Building Technologies (under the Performance Contracting Agreement in 2005) included adding the control points for the boiler and heating system pumps start/stop, status and reset. Unlike the chilled water system, the heating systems distribution systems have not been interconnected.

The existing boilers total capacity is approximately 8,805,000 btu/hr input (5,562,000 btu/hr output).

The existing underground heating hot water system piping throughout the campus is in poor condition. According to the maintenance staff, the piping frequently ruptures at the points of connections to the buildings. This may be related to inadequate expansion compensation provided during the original piping installation and may happen in any point of the piping with increased lateral movement. The underground piping leaks may not be noticed for long periods of time, during which the feedwater is being introduced into the system in substantial quantities. The untreated feed water is the primary reason for the scaling on the boilers and piping interior and causes the reduction in the boiler efficiency. In light of the above statement, it would be prudent to assume the boilers capacity reduction by about 15%, thus reducing the available boilers total output to about 9,000,000 btu/hr. Even with this reduction the capacity is more then adequate for the existing campus heating.

Table 1 - 2012 Cooling Requirements

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	COOLING TONS*	COOLING GPM**
1	LABORATORY/ ADMINISTRATION	38,205	266	456
2	STUDENT CENTER (former Library)	37,535	150	257
3	BOOKSTORE (former College Center)	10,515	31	53
4	STUDENT SERVICES A	10,855	30	51
5	STUDENT SERVICES C (former Classroom Building)	7,110	25	43
6	OCCUPATIONAL EDUCATION 1	9,745	40	69
7	EMERGENCY SERVICES (OE2 replacement building)	34,104	100	171
8	PERFORMING ARTS CENTER	32,715	312	535
9	MAINTENANCE & OPERATIONS	14,286	–	–
10	GYMNASIUM	17,930	–	–
12	CHEMISTRY	17,270	100	171
13	CHILD DEVELOPMENT CENTER 1	3,970	–	–
14	CHILD DEVELOPMENT CENTER 2	2,685	–	–
16	STUDENT SERVICES B	5,745	30	51
20	LEARNING RESOURCE CENTER	53,500	215	368
21	HUMANITIES 1	24,369	170	291
25	COMMUNITY RECREATIONAL FACILITY	7,000		
	TOTALS		1,469	2,516

* Calculated based on the Cooling Load Check figure provided in ASHRAE Guide for HVAC.

**Based on 14° F chilled water delta T. 16° F to 18° F delta T will be evaluated during the detailed systems study in the construction documents phase.

3. Air Handling Systems

The majority of the air handling systems on campus are multizone type and are of original construction. Over the years, there was very little remodeling done on the buildings. The air handling units are provided with the heating and cooling coils, supply air blower and 30%efficiency filters.

In 2005 the multizone air handling units were converted from the constant volume into the variable air volume systems under the Performance Contracting Agreement conducted by Siemens Building Technologies. The two position control dampers located at the units were replaced with the modulating control dampers and the supply air fans were equipped with the variable frequency drives. This has increased the units' efficiency due to the utilization of the cooling load diversity factor.

However, with the introduction of the information technology, the cooling demand on campus has increased substantially. Due to the limited air handling unit capabilities the air circulation in classrooms is ineffective and the elevated room temperature compromises the comfort level. Stagnated air was noticeable especially in the science classrooms. Additionally the existing air handling systems have the following deficiencies:

- The units' condensate drain pans have no slope and are noncompliant with the Indoor Air Quality Counsel (IAQ) requirements. The non-sloped condensate drain pan is a main sourse of breading algae.
- The air handling units have developed numerous leaks around doors and panels.
- The duct liner in units is missing in many places and will require substantial repairs.
- The units are of a commercial grade and have poor access to the cooling coil and to the condensate drain pan. The coils and pans are not cleaned since the original buildings construction.
- The vibration isolators are shot on most of the units and don't absorb supply fan vibration.
- The existing ductwork is at the limit where the additional airflow cannot be delivered without generating excessive noise in the ducts.
- The existing air handling systems are noncompliant with the mechanical code and NFPA-45 in respect to the chemical fume hood exhaust requirements, the number of air change in laboratories, chemical storage room ventilation and missing fire smoke dampers.
- Over the years the air handling units and the air distribution systems have collected a lot of dust and require professional environmental cleaning.
- Room thermostats are mounted at elevations non compliant with the Americans with Disabilities Act (ADA), which requires thermostats to be mounted at 48" above finished floor.

Campus Wide Chilled Water System Master Planning

1. 2005 - 2012

By year 2012, when the renovation of the existing buildings and the new buildings are completed as outlined in the current master plan, the projected cooling load on campus will increase from the existing 700 tons to approximately 1500 tons. For the 2012 projected cooling load summary including the two central plants see Table No.1 below. The load can be handled by supplementing of the Laboratory/Administration Building and SSA existing chiller plants with an 700-ton centrifugal chiller. The Gymnasium 100-ton central plant will continue operating as a self contained facility.

The new chiller should be provided in the Laboratory/Administration Building central plant and will be equipped with variable frequency drive (VFD). The chiller shall be manufactured by Carrier or Trane. A matching cooling tower manufactured by Baltimore Air Coil will be provided to handle the new chiller load. The central plant will be also equipped with a new primary and secondary chilled water pumps to handle the system water circulation. All pumps will be equipped with VFDs. For the central plant modifications see the Laboratory/Administration Building central plant floor plan. The following modifications to the Laboratory/Administration Building and SSA existing chiller plants should be made:

- The primary/secondary chilled water piping shall be reconfigured at the Laboratory/Administration Building existing chiller plant in order to accommodate the new chiller installation. As an option, the piping at the plant may be reconfigured as required to accommodate the 2025 installation. Otherwise the related to 2025 work can be accomplished at the later phase.
- The secondary chilled water system pump will be replaced at both chiller plants in order to satisfy the chilled water flow increase and the new pump head.
- A new single-cell 2100 gpm cooling tower matching the 700-ton chiller capacity and equipped with VFD will be provided in the existing cooling tower yard located outside adjacent to the boiler room. The (two) existing cooling towers will remain in place and the existing yard will need to be expanded in order to provide space for the new cooling tower.

The existing underground chilled water distribution piping is old, severely corroded, the pipe sizes are inadequate for the new loads. We recommend abandoning the existing piping in place. Parts of the existing piping system interfering with the new piping routing will be removed. Where feasible, the existing points of the underground piping to building connection will be utilized for the new piping in order to minimize the building down time and the construction cost.

The new piping will be preinsulated steel pipe Sch. 40 manufactured for the underground installation and will be sized to handle the future cooling load projected for the year 2025.

Where indicated on the Master Plan drawings, the chilled water pipe will be arranged to transit through the existing building basements in order to reduce the distribution piping installation cost.

Table 2 - 2025 Cooling Requirements

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	COOLING TONS*	COOLING GPM**
1	LABORATORY CENTER (former Laboratory/Administration Bldg.)	38,205	266	456
2	STUDENT CENTER (former Library)	37,535	150	257
3	BOOKSTORE (former College Center)	10,515	31	53
4	STUDENT SERVICES A	10,855	30	51
5	STUDENT SERVICES C (former Classroom Building)	7,110	25	43
6	OCCUPATIONAL EDUCATION 1	9,745	40	69
7	EMERGENCY SERVICES (OE2 replacement building)	34,104	100	171
8	PERFORMING ARTS CENTER	32,715	312	535
9	MAINTENANCE & OPERATIONS	14,286	–	–
10	GYMNASIUM	17,930		
11	WELLNESS CENTER	24,475		
12	CHEMISTRY	17,270	100	171
13	CHILD DEVELOPMENT CENTER 1	3,970	–	–
14	CHILD DEVELOPMENT CENTER 2	2,685	–	–
15	CHILD DEVELOPMENT CENTER EXPANSION	12,118	–	–
16	STUDENT SERVICES B	5,745	30	51
19	ADMINISTRATION/ STUDENT SERVICES	27,713	45	77
20	LEARNING RESOURCE CENTER	53,500	215	369
21	HUMANITIES 1	24,369	170	291
22	HUMANITIES 2	44,531	360	617
23	PERFORMING ARTS CENTER EXPANSION	13,295	144	247
24	SCIENCES	36	175	300
25	COMMUNITY RECREATIONAL FACILITY	7,000		
26	COMMUNITY CENTER	15,000		
	TOTALS		2,193	3,758

* Calculated based on the Cooling Load Check figure provided in ASHRAE Guide for HVAC.

**Based on 14° F chilled water delta T. 16° F to 18° F delta T will be evaluated during the detailed systems study in the construction documents phase.

2. 2013 - 2025

By 2025, when the renovation of the existing buildings and the new buildings are completed as outlined in the current master plan, the projected cooling load on campus will increase from 1400 tons to about 2,100 tons. For the cooling load tabulation see Table No.2 below.

All Laboratory/Administration and SSA building existing chillers with the exception of the 700-ton chiller installed under the 2012 master plan will approach the end of useful service life and should be decommissioned. The new chillers will be provided at the Laboratory/Administration Building chiller central plant and will be installed in place of the (2) two existing 200-ton chillers. The new central plant will consist of (2) two new 700-ton centrifugal chillers and the 700-ton existing chiller. For the central plant modifications see Laboratory/Administration Building central plant floor plan.

The following modifications to the plant will be required:

- The primary/secondary chilled water piping system shall be reconfigured at the Laboratory/Administration Building existing chiller plant in order to accommodate the new chillers installation. (2) Two new primary and (3) three new secondary chilled water pumps will be provided and the piping in plant will be reconfigured in order to accommodate the new equipment layout.
- The secondary chilled water system pumps will be replaced in order to satisfy the increase in the chilled water flow rate.
- The (2) two existing cooling towers will be decommissioned. (2) Two new 2,100 gpm each cooling towers will be provided in the existing cooling tower yard.

At that time the Gymnasium central plant will be retrofitted with new 175-ton centrifugal chiller sized to handle the adjacent Wellness Center. The new 525 gpm cooling tower and chilled water pump both equipped with the VFD will be provided and the piping modified to handle the increased system capacity.

The 15,000 sq.ft Community Building due to its remote location will not be feasible to feed with the chilled and heating water from the central plant. Therefore, the building will be provided with rooftop packaged units.

Campus Wide Heating Hot Water System Master Planning

1. Year 2012 Phase

By the year 2012 the heating requirements will increase from the present 5,562,000 btu/hr output to the estimated output of 11,840,000 btu/hr. The existing boiler located on the roof of the Occupational Education Building No. 1 is in poor operating condition and should be decommissioned. A new 8,200,000 Btu/hr input (6,840,000 output) Low-NOx forced draft heating hot water boiler will be added to supplement the remaining existing boilers and will be located in the existing Laboratory/Administration Building Boiler Room. See table 3. Boilers will be heavy-duty commercial grade made by Ajax Boilers or equal.

Boilers located in the Laboratory/Administration Building and in the SSA Buildings will be interconnected through the underground heating water piping into a common primary circulating loop. With the exception of the Gymnasium Building, all buildings indicated in Table 3 will be fed off the new heating hot water loop.

The primary loop heating hot water circulating pumps will be sized for the individual boiler water flow with the pressure head adequate to assure water flow in the loop at the different flow conditions. Each building secondary piping loop will be connected to the primary loop with a crossover piping equipped with the 3-way modulating mixing valve. Each building will be provided with the variable flow secondary heating water pump.

Due to the numerous problems associated with the underground distribution heating water piping we recommend abandoning it in place and providing new piping to meet the requirements of the buildings outlined in the 2012 master plan. The new piping will be preinsulated steel pipe Sch. 40 manufactured for the underground installation and will be sized to handle the future heating load projected for the year 2025.

The gymnasium building will continue operating as a stand-alone until year 2025. The Natatorium building will be heated only and will be fed off the pool heating system.

2. Year 2025 Phase

By the year 2025 the heating requirements will increase from established for the year 2012 the 11,040,000 btu/hr to the estimated 18,300,000 btu/hr. See Table 4 below for the tabulated heating loads.

At that time with the exception of the boiler installed in 2012, we recommend decommissioning of all the existing boilers located in the Lab/Admin Building and in the SSA Building. (2) Two new 7,350,000 btu/hr input (6,247,500 btu/hr output) Low-NOx forced draft heating hot water boilers. These boilers shall be located in the Laboratory/Administration Building boiler room. The primary and secondary loop heating water pumps shall be provided to handle the entire campus.

The gymnasium building will be retrofitted with the new 1,500,000 btu/hr boiler sized to handle the new Wellness Center. The Community Center heating will be provided by the rooftop packaged equipment.

Table 3 - 2012 Heating Requirements

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	HEATING Btu/hr	HEATING GPM*
1	LABORATORY/ ADMINISTRATION	38,205	2,300,000	115
2	STUDENT CENTER (former Library)	37,535	1,500,000	75
3	BOOKSTORE (former College Center)	10,515	320,000	16
4	STUDENT SERVICES A	10,855	320,000	16
5	STUDENT SERVICES C (former Classroom Building)	7,110	280,000	14
6	OCCUPATIONAL EDUCATION 1	9,745	500,000	25
7	EMERGENCY SERVICES (OE2 replacement building)	34,104	1,020,000	51
8	PERFORMING ARTS CENTER	32,715	1,000,000	50
9	MAINTENANCE & OPERATIONS	14,286	–	–
10	GYMNASIUM	17,930	–	–
12	CHEMISTRY	17,270	1,040,000	52
13	CHILD DEVELOPMENT CENTER 1	3,970	–	–
14	CHILD DEVELOPMENT CENTER 2	2,685	–	–
16	STUDENT SERVICES B	5,745	180,000	9
20	LEARNING RESOURCE CENTER	53,500	1,600,000	80
21	HUMANITIES 1	24,369	980,000	49
25	COMMUNITY RECREATIONAL FACILITY	7,000		
	TOTALS		11,040,000	552

* Based on 40° F heating water delta T.

Campus Wide Air Handling Systems Master Planning

Based on the evaluation of the existing air handling systems, we recommend replacing the air handling units for the following reasons:

- The existing air handling unit cooling coils are sized without the consideration for the cooling loads increase associated with the addition of the information technology on campus.
- The existing coils chilled water delta T is many cases 10 degrees, which will require higher water flow and consequently larger pipe sizes. A deeper - more row coil may be required to do the job.
- The condensate drain pans have no slope and are noncompliant with the Indoor Air Quality Counsel (IAQ).
- The units have numerous air leaks around doors and panels.

The new DDC controls such as sensors, smoke detectors, control valve operators, etc installed by Siemens on the existing units are in good operating condition and will be reused and relocated into the new systems. The room thermostats elevation above floor will be brought into compliance with the Americans with Disabilities Act throughout the campus.

The existing ductwork will be reused in places where it can be easily adapted to the new space planning requirements and will not require substantial rework. In all other cases the ductwork will be completely replaced. A more detailed assessment of the ductwork will be conducted at the later phase of the project.

Heating, Ventilation and Cooling (HVAC) Systems

1. General Requirements

Air conditioning will be provided to the laboratories, classrooms, and the offices. The air-handling units for the remodeled existing buildings will be located in the present locations. Air handling units serving the new buildings will be located in new mechanical rooms. Variable Speed pumping will be provided on the Chilled Water and Heating Hot Water systems to circulate the chilled water to the air-handling units and heating hot water to reheat coils. The exhaust fans in general will be located on the roof of the building.

2. Codes and Standards

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers • Standard 90 A, B, C, Energy Conservation in New Building Design • Design Guidelines relating to Laboratory Design
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CISPI	Cast iron Soil Pipe Institute
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association • Section 34 • Section 45: Laboratories using Chemicals • Section 54 •Section 90 • Section 91
OSHA	Occupational Safety and Health Administration
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
UL	Underwriters Laboratories, Inc
ANSI	American National Standards Institute
AABC	Associated Air Balance Association
CPC	California Plumbing Code
EPA	Environmental Protection Agency
CBC	California Building Code
CMC	California Mechanical Code
CFC	California Fire Code
CEC	Title 24 California Energy Code for Non-Residential Buildings
SFM	Los Angeles Fire Department

Table 4 - 2025 Heating Requirements

			HEATING	
BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	Btu/hr	GPM*
1	LABORATORY CENTER (former Laboratory/Administration Bldg.)	38,205	2,300,000	115
2	STUDENT CENTER (former Library)	37,535	1,500,000	75
3	BOOKSTORE (former College Center)	10,515	320,000	16
4	STUDENT SERVICES A	10,855	320,000	16
5	STUDENT SERVICES C (former Classroom Building)	7,110	280,000	14
6	OCCUPATIONAL EDUCATION 1	9,745	400,000	20
7	EMERGENCY SERVICES (OE2 replacement building)	34,104	1,020,000	51
8	PERFORMING ARTS CENTER	32,715	1,000,000	50
9	MAINTENANCE & OPERATIONS	14,286	–	–
10	GYMNASIUM	17,930		
11	WELLNESS CENTER	24,475		
12	CHEMISTRY	17,270	1,040,000	52
13	CHILD DEVELOPMENT CENTER 1	3,970	–	–
14	CHILD DEVELOPMENT CENTER 2	2,685	–	–
15	CHILD DEVELOPMENT CENTER EXPANSION	12,118	–	–
16	STUDENT SERVICES B	5,745	180,000	9
19	ADMINISTRATION/ STUDENT SERVICES	27,713	360,000	18
20	LEARNING RESOURCE CENTER	53,500	1,600,000	80
21	HUMANITIES 1	24,369	980,000	49
22	HUMANITIES 2	44,531	2,100,000	105
23	PERFORMING ARTS CENTER EXPANSION	13,295	380,000	19
24	SCIENCES	36	1,880,000	94
25	COMMUNITY RECREATIONAL FACILITY	7,000		
26	COMMUNITY CENTER	15,000		
	TOTALS		15,660,000	783

* Based on 40° F heating water delta T.

Design Criteria

1. Climatic Design Parameters

See Table 1.
Mechanical Rooms shall be designed to maintain a maximum of 90 F
Electrical and Elevator Machine Rooms shall be conditioned as required to offset heat rejection of equipment and maintain room below 80 F.
Telecommunication Spaces shall be maintained below a maximum of 72 F.
Indoor Relative Humidity: The cooling systems shall be designed to ensure the summer humidity is maintained below 70% RH during part load conditions. In general, humidity will not be controlled.

2. Building Envelope

The new building envelope shall exceed requirements of 2005 California Energy Code for minimum thickness of roof and wall insulation. As a basis glazing shall be double pane Low-E type, however consideration shall be given to the net benefit to the building of omitting the low e-coating to promote heat loss due to the high internal loads. External shading shall be considered where it will minimize the effects of solar radiation on the building interior. Internal blinds shall be provided on all exterior windows.

3. Building Hours of Operation

The Building is a facility that should allow staff 24-hour availability to the laboratories, and the informational technology areas. HVAC systems in the laboratories should run at all times because of the hazards that might exist in the laboratories. The systems serving the laboratories shall be designed to allow normal maintenance without shutting down the complete system. The classrooms and offices are considered 7am to 9pm operation and will be designed to close down outside these hours.

4. Internal Heat Gains

The HVAC system shall be sized to compensate for the following internal heat gains as the basis of design: see tables 2, 3, & 4.
Lighting loads are shown for estimating purposes; actual heat gain from lighting shall be determined by the electrical engineer.
Loads for laboratories are shown for estimating purposes; actual heat gains will be determined based on the equipment cut sheets for each space with 50% load diversity.

5. Ventilation Requirements

Laboratories & Laboratory Support Areas:

The Laboratory areas shall be supplied with 100% outdoor air, no return air; with exhaust either through fume hoods or the general laboratory exhaust. Special consideration shall be given to laboratories, which do not utilize chemicals. In these cases the laboratories may utilize conventional variable air volume control systems with return air.

Classrooms, Offices and Conference Rooms:

Classroom, Offices and Conference Rooms shall be provided with 15-cfm/person outside air. The total air supplied will meet the maximum cooling load. The occupancy shall be based on block load amount and not individual occupant room total. All areas will utilize overhead supply air distribution and air return.

Storage and Equipment areas:

Storage room four air changes exhaust per hour minimum.

Toilets and Janitor rooms:

Twelve air changes per hour exhaust for toilets.
Six air changes per hour exhaust for janitor rooms.

Fume Hood Exhaust systems:

The chemical fume hood exhaust system shall be designed to maintain 100 feet per minute across the fume hood sash at any sash opening.

Table 5 - Climatic Data Parameters

Location	Yucaipa, California
Latitude	34
Elevation	2600 feet
Climate Zone	10

Room Types	Office Conference Rooms Classrooms Auditorium Lobby Spaces (@ .5% occurrence)	Laboratory Laboratory Support Spaces (@ .1% occurrence)
Outside Design Wet Bulb	67 F	68 F
Outside Design Dry Bulb	Summer Design 102 F	Summer Design 106 F
Winter Design	27 F	27 F
Indoor Design Summer	75 F & 50% RH	75 F & 50% RH
Indoor Design Winter	72 F	72 F

- Laboratory includes labs, support areas, specialty rooms, etc.

Table 6 - Internal Heat Gains

Space	Basis	Heat gain Sensible/ Latent
Laboratories	30 sq. ft./person	250/250 Btuh
Lab Support	100 sq. ft./person	250/250 Btuh
Meeting Rooms, Conference Rooms	20 sq. ft./person	250/200 Btuh
Open Plan Offices	100 sq. ft./person	250/200 Btuh
Individual Offices	1 person	250/200 Btuh
Lobbies, Foyers, Corridors	200 sq. ft./person	245/200 Btuh
Café	10 sq. ft./person	275/275 Btuh
Classrooms, Lecture Halls, Auditorium	20 sq. ft./person or number of fixed seating	250/200 Btuh

Table 7 - Lighting Heat Gains

Space	Lighting Load
Laboratories	2.0 watts/sq. ft.
Lab Support	2.0 watts/sq. ft.
Meeting Rooms, Conference Rooms	1.3 watts/sq. ft.
Offices	1.3 watts/sq. ft.
Lobbies, Foyers, Corridors	1.0 watts/sq. ft.
Café	1.5 watts/sq. ft.
Classrooms, Lecture Halls, Auditorium	1.3 watts/sq. ft.

Table 8 - Miscellaneous Internal Heat Gains

Space	Miscellaneous Loads	% Gain to return/ exhaust air
Laboratories	10.0 watts/sq. ft.	0
Meeting Rooms, Conference Rooms	1.0 watts/sq. ft.	0
Open Plan Offices	1.0 watts/sq. ft.	0
Individual Offices	2.5 watts/sq. ft.	
Lobbies, Foyers, Corridors	0.5 watts/sq. ft.	0
Café	1.0 watts/sq. ft.	
Classrooms, Lecture Halls, Auditorium	1.0 watts/sq. ft.	0

6. Future Capacity and Diversity within the Classroom and Office Areas
Design of the Air Handling system shall allow for 10% additional capacity for future use.

7. Energy Conservation:
A goal of the project is to pursue an energy conscious design and beat the 2005 California Energy Code maximum energy usage. This can be accomplished in a number of ways including the following:

- Pipe and duct insulation minimum thickness shall exceed Title 24 by 30% minimum.
- Building Envelope: Thermal insulation of a performance up to 30% greater than the minimum required meeting Title 24.
- Fenestration: Double Glazed, Low-E solar heat gain coefficient (SHGC) glazing, and internal blinds and/or external sun control or shades shall be an integral part of the design
- The premium efficient motors shall be provided for equipment.
- Variable volume air systems shall be used.
- Fans, pumps and chillers will be equipped with the variable frequency drives (VFD).
- Reduced coil face velocity design for low air pressure drop to save fan horsepower all year.
- Two-way valves for coils with variable pumping systems using a VFD where appropriate.

8. Noise Criteria
The following noise criteria levels will be achieved. It should be noted that these levels address the mechanical systems only. Mitigation of traffic noise and air traffic noise will utilize the building fabric to ensure the interior spaces are not affected.

• Offices	NC 35
• Enclosed Offices, Meeting Rooms	NC 30 to NC 35
• Conference Rooms, Classrooms	NC 30
• Info Technology (Recording areas)	NC 15
• Laboratories	NC 40

9. Classroom and Office Air Handling Units
- Classroom and Office Air handling units shall be double wall unit and be located in a mechanical room.
- The units will be a Variable Air Volume air handling unit containing the following minimum components in a draw-through arrangement: supply air fan, chilled water cooling coil, pre-filter and final filter section, return air fan, outside air economizer, outside air, return and relief dampers and vibration isolators. Outside air and relief air will be ducted to and from the unit.
- Air is distributed and returned via four perimeter riser shafts. VAV boxes with terminal reheat will be provided for each 600 sq. ft. at the perimeter and 1,000 sq. ft. in the interior of the building. Dedicated VAV boxes will be provided for corner offices, classrooms and conference rooms. The ceiling void will be used as a return air plenum within the offices. Ducted return air will be provided in the classrooms.

Sustainable Power Generating Technology

In light of the of LEED™ Certification – resulting in "green" buildings that can leverage state and/or federal financial incentives, we have evaluated the UTC Power PureComfort™ Cooling, Heating, and Power system. The system is designed to operate as a self contained cogeneration system providing clean, effective, and reliable power. It consists of a heat recovery absorption chiller manufactured by Carrier and multiple microturbines manufactured by Capstone. The entire system is fully integrated with proven design and performance.

The PureComfort™ system uses air-cooled, lubricant-free, low-maintenance microturbine generators. Microturbines generate electricity through the combustion of natural gas. The power generated is clean by virtue of advanced digital power electronics and has an ultra low emission of less then 9 ppm of NOx. The system is CARB-certified, meeting California's stringent air emissions standard as a prime mover for 24/7 operation.

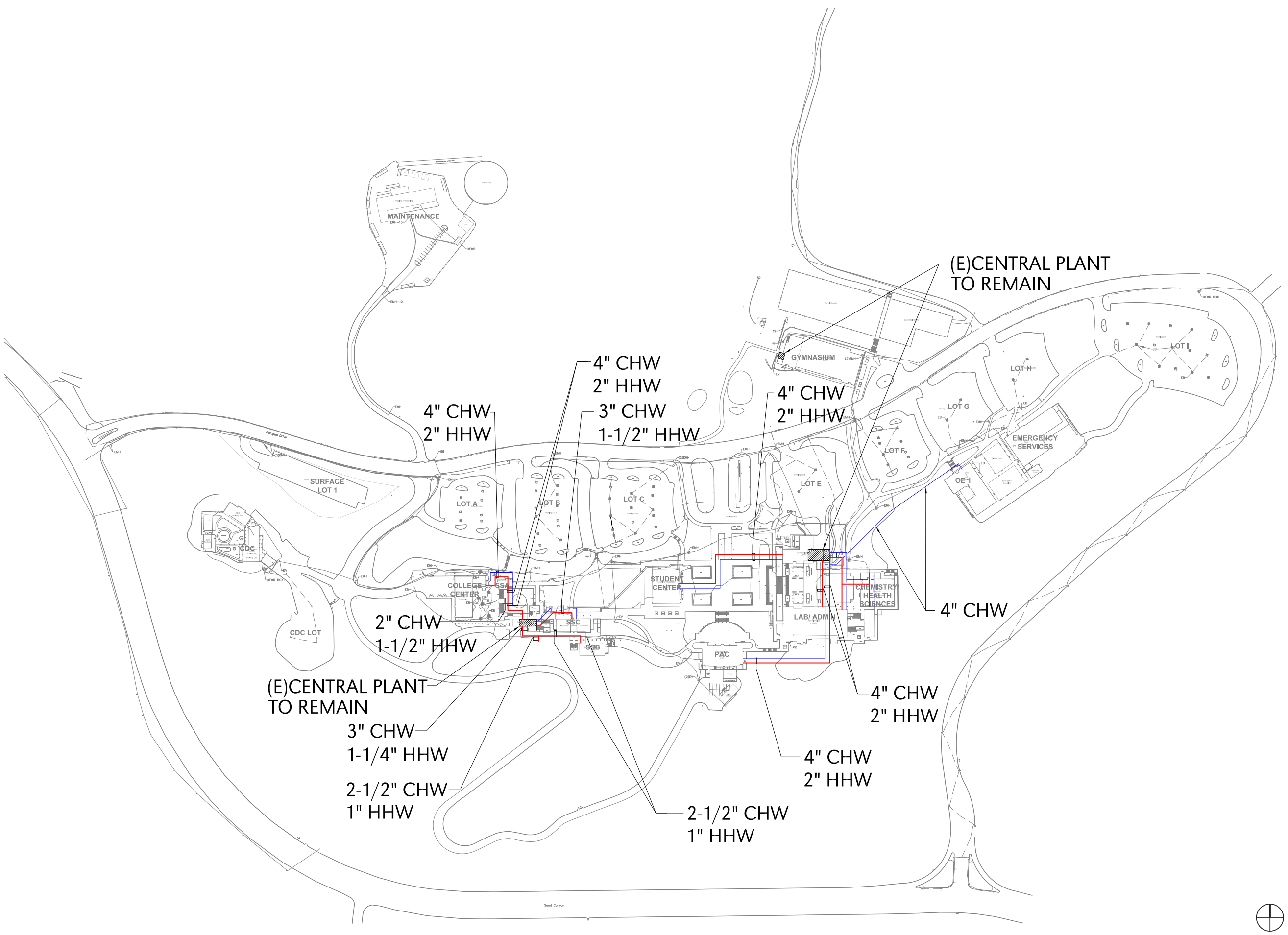
Cooling or heating is provided by an absorption chiller/heater. This chiller/heater is driven by recaptured exhaust heat from the microturbines, producing cooling/heating with zero-cost fuel. The absorption chiller/heater is a double-effect type which maximizes the heat recovery ensuring high system efficiency. The system can operate in three different modes:

- Power/Cooling Mode: In this mode the system provides electricity and chilled water.
- Power/Heating Mode: In this mode the system provides electricity and heating hot water.
- Power Mode: In this mode the system generates electricity only.

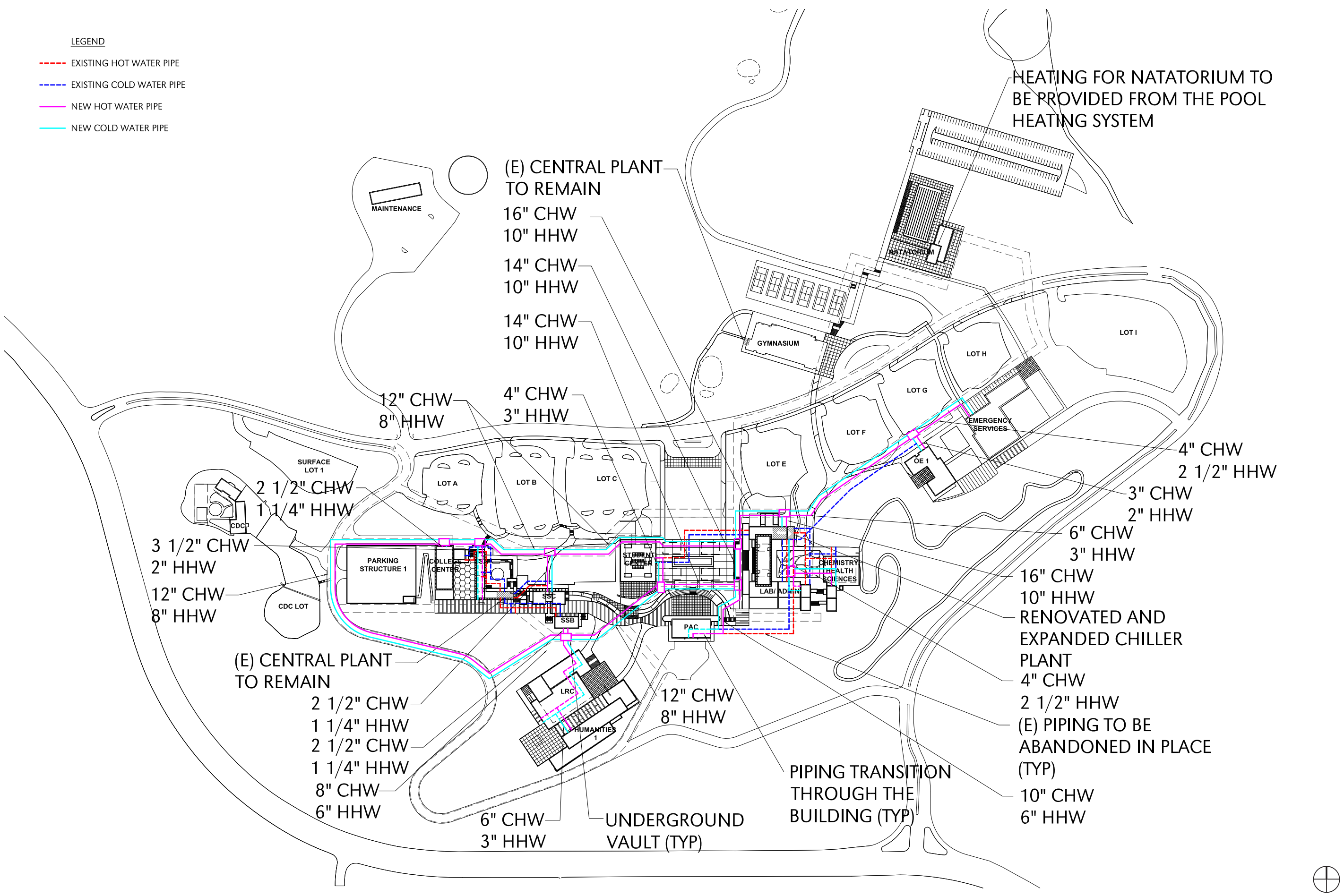
Based on the evaluation, the PureComfort™ system can generate only 360 kW of power and 160 tons of cooling.

In light of the limited size of the system feasible for the campus we do not recommend the system inclusion into the Master Planning Program.

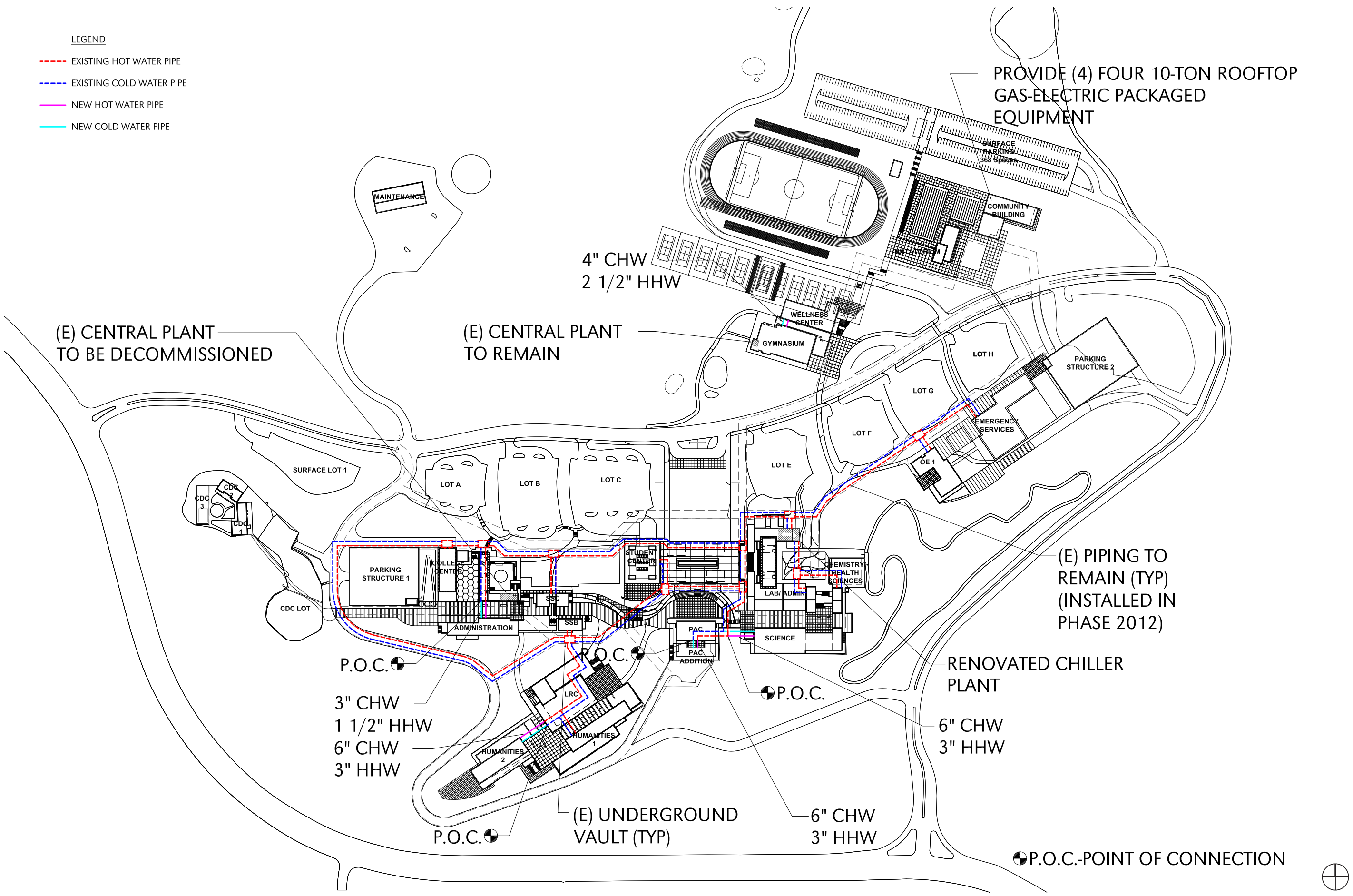
CHILLED WATER/ HOT WATER SYSTEM | EXISTING



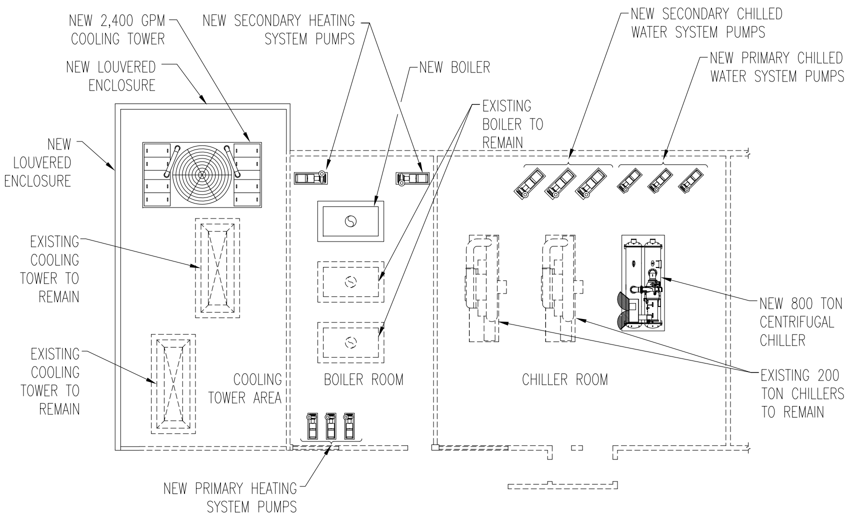
CHILLED WATER/ HOT WATER SYSTEM | 2012



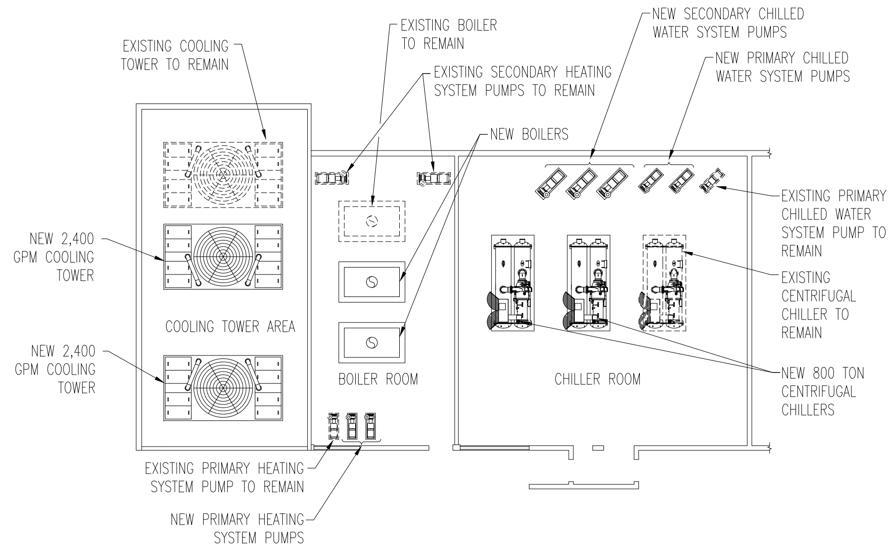
CHILLED WATER/ HOT WATER SYSTEM | 2025



CHILLER PLANT RENOVATION

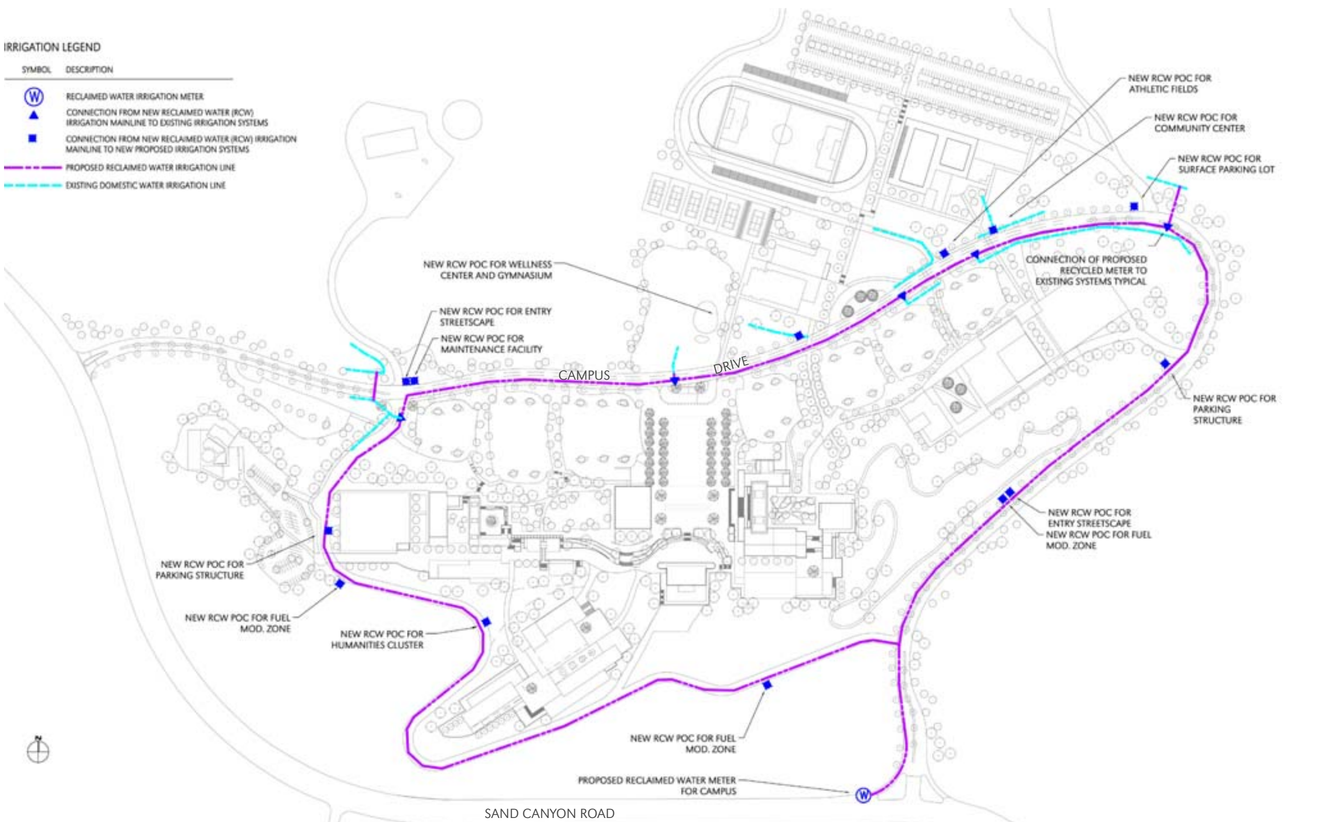


2012 LAB/ADMIN BUILDING CHILLER PLANT RENOVATION



2025 LAB/ADMIN BUILDING CHILLER PLANT RENOVATION

IRRIGATION GUIDELINES | MAINLINE ROUTING



OPTION A: RECLAIMED WATER MAINLINE ROUTING

Under the current irrigation system, the College is experiencing water shut-offs during critical periods and increased water costs from its water purveyor, the City of Redlands. With the exception of the Child Development Center facility, a new reclaimed water system is recommended and would take advantage of an alternative water source available through the Yucaipa Valley Water District.

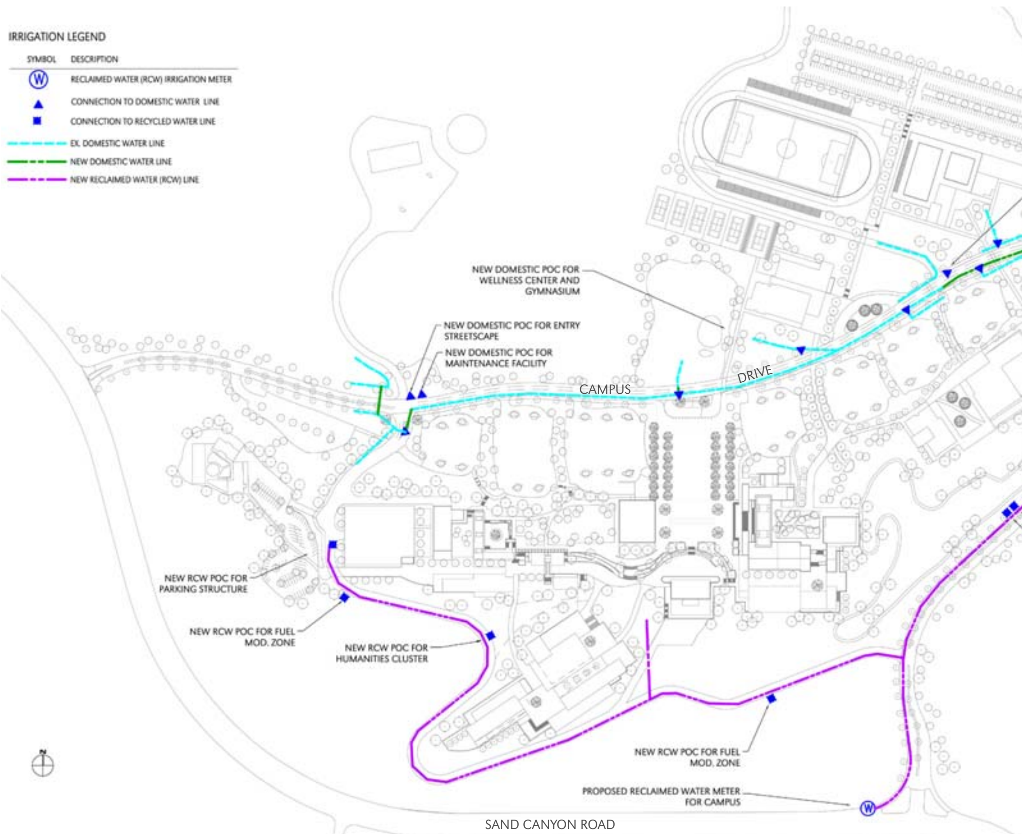
Two alternatives for a reclaimed water irrigation system are presented in this section. Option A (this page) implements a nearly full conversion to reclaimed water. This option is the preferred recommendation. If cost is a concern, Option B (next page) presents a combination of reclaimed and domestic water systems. Under this alternative, the reclaimed water will cover the new areas at the College's southern edge, including the fuel modification and hillside coastal sage zones. The domestic water system will re-use existing irrigation mainlines whenever possible.

The conversion to a full or partial reclaimed water system will require agreement between the two water districts regarding the provision of reclaimed water to Crafton Hills College. At the time of this writing, discussions among the water districts and the college had not yet occurred. Although the connection to the reclaimed water system should provide savings in water cost per unit, specific savings cannot be evaluated until the Yucaipa Valley Water District and City of Redlands reach an agreement.

In the event that a reclaimed water irrigation system is not feasible, a third alternative – a Domestic Water mainline routing – is also presented in this section as "Option C".

Several steps are recommended for converting from the existing system to a reclaimed water system. The last two items listed below are also recommended if a domestic water irrigation system is implemented.

- Make connection to the existing reclaimed water line at the street, provide one meter for the entire campus.
- Provide irrigation booster pump at the reclaimed water point of connection, size to be determined as part of final calculations.



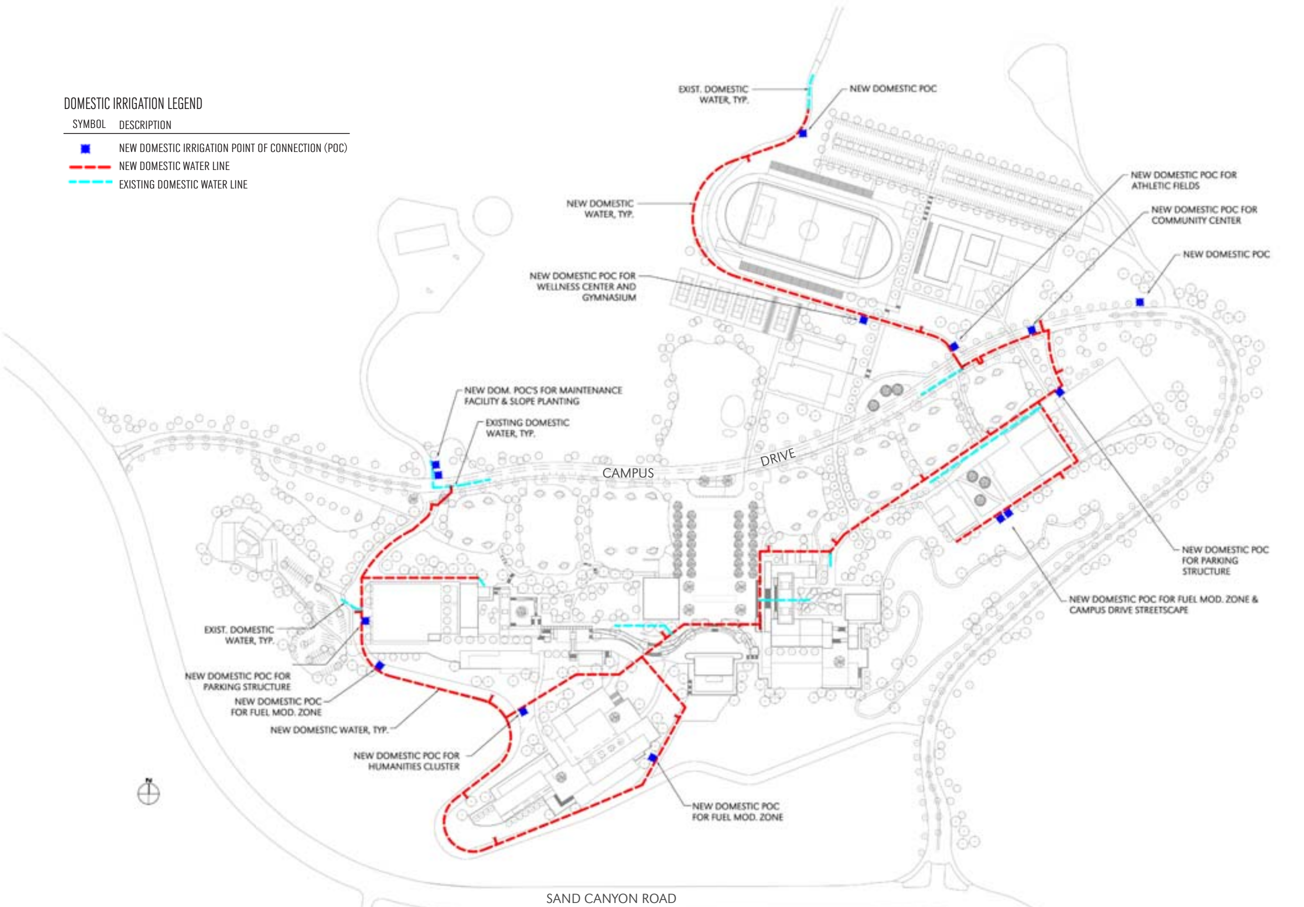
OPTION B: COMBINED RECLAIMED WATER AND DOMESTIC WATER MAINLINE ROUTING

- The initial phase of improvements will include the backbone reclaimed water loop to provide water for any existing domestic irrigation systems that will be converted to reclaimed water, as well as to provide connections for future improvement areas.
- According to the Yucaipa Valley Water District, conversions to reclaimed water systems do not require replacement of the existing potable irrigation lines to purple pipes. Typically, conversions require only reclaimed water tags on valves, purple caps on all irrigation heads, irrigation water signage, purple valve boxes, etc. When the water districts reach an agreement, conversion requirements by the water purveyor should be confirmed. Any new irrigation lines, however, will be installed using the purple pipes required for reclaimed water systems.
- Rain Master irrigation control systems will be used to connect to the campus irrigation central control. Irrigation master valves and flow sensors are proposed for all new work, as well as for the existing irrigation systems if feasible. Controllers with flow sensors will allow the College to track water usage. If the College desires more accurate usage tracking, meters can be installed at each point of connection.
- Under Options A, B and C, the Child Dvelopment Center will remain on a domestic water irrigation system.

City and Water District Contacts:

- City of Redlands water district, contact: Mike Taylor at 909-557-6447.
- City of Redlands, Municipal Utilities Engineering, contact Doug Heddrick at 909-798-7698
- Yucaipa Valley Water District (reclaimed water), contact: Brett Anton, 909-797-5118, extension 5.

IRRIGATION GUIDELINES | MAINLINE ROUTING



OPTION C: DOMESTIC WATER MAINLINE ROUTING

This page shows the mainline routing for a domestic water irrigation system, Option C.

IRRIGATION GUIDELINES | EQUIPMENT LIST

MANUFACT.	MODEL NO. / DESCRIPTION	GPM	PSI	RADIUS
HUNTER	INST-06-CV POP-UP TURF HEAD W/ RAIN BIRD 5-Q/T/H NOZZLES	.20, .30, .40	30	5 FT
HUNTER	INST-06-CV POP-UP TURF HEAD W/ RAIN BIRD 8-Q/T/H/F NOZZLES	.26, .35, .52, 1.58	30	8 FT
HUNTER	INST-06-CV POP-UP TURF HEAD W/ RAIN BIRD 10LA-Q/T/H/F NOZZLES	.39, .52, .79, 1.57	30	10 FT
HUNTER	INST-06-CV POP-UP TURF HEAD W/ RAIN BIRD 12-Q/T/H/F NOZZLES	.65, .87, 1.3, 2.6	30	12 FT
HUNTER	INST-06-CV POP-UP TURF HEAD W/ RAIN BIRD 15-Q/T/H/F NOZZLES	.93, 1.23, 1.85, 3.70	30	15 FT
HUNTER	INST-06-CV-LCS-515/RCS-515/SS-530 POP-UP TURF HEAD	.65, 1.30	30	4X15 FT 4X30 FT
HUNTER	INST-12-CV POP-UP SHRUB HEAD W/ RAIN BIRD 5-Q/T/H NOZZLES	.20, .30, .40	30	5 FT
HUNTER	INST-12-CV POP-UP SHRUB HEAD W/ RAIN BIRD 8-Q/T/H NOZZLES	.26, .35, .52, .1.58	30	8 FT
HUNTER	INST-12-CV POP-UP SHRUB HEAD W/ RAIN BIRD 10LA-Q/T/H/F NOZZLES	.39, .52, .79, 1.57	30	10 FT
HUNTER	INST-12-CV POP-UP SHRUB HEAD W/ RAIN BIRD 12-Q/T/H/F NOZZLES	.65, .87, 1.3, 2.6	30	12 FT
HUNTER	INST-12-CV POP-UP SHRUB HEAD W/ RAIN BIRD 15-Q/T/H/F NOZZLES	.93, 1.23, 1.85, 3.70	30	15 FT
HUNTER	INST-12-CV-LCS-515/RCS-515/SS-530 POP-UP SHRUB HEAD	.65, 1.30	30	4X15 FT 4X30 FT
HUNTER	INST-06-CV POP-UP BUBBLER HEAD W/ RAIN BIRD 5FB/5CST-PCS-040 NOZZLES, USE 5F-B NOZZLES FOR PLANTERS WIDER THAN 21/2', USE 5CST-B NOZZLES FOR PLANTERS LESS THAN 21/2'	.40	30	3 FT
HUNTER	INST-06-CV-PCN-50 POP-UP BUBBLER HEAD, EACH SYMBOL REPRESENTS TWO BUBBLERS PER TREE, PLACE BUBBLERS AT EDGE OF ROOTBALL ON OPPOSITE SIDES OF TREE TYPICAL.	.50 (1.O)	30	N/A
HUNTER	I-20-6P-ADS/36S W/ NOZZLES 1.0/1.5/3.0 POP-UP TURF ROTOR HEAD	1.0, 1.4, 2.4	40	25 FT
HUNTER	I-20-6P-ADS/36S W/ NOZZLES 1.0/2.0/4.0 POP-UP TURF ROTOR HEAD	1.0, 1.8, 3.7	40	30 FT
HUNTER	I-20-6P-ADS/36S W/ NOZZLES 1.5/3.0/6.0 POP-UP TURF ROTOR HEAD	1.4, 2.4, 4.9	40	35 FT
HUNTER	I-20-6P-ADS/36S W/ NOZZLES 2.0/3.5/8.0 POP-UP TURF ROTOR HEAD	1.8, 3.0, 6.0	40	40 FT
HUNTER	I-20-HP-ADS/36S W/ NOZZLES 1.0/1.5/3.0 POP-UP TURF ROTOR HEAD	1.0, 1.4, 2.4	40	25 FT
HUNTER	I-20-HP-ADS/36S W/ NOZZLES 1.0/2.0/4.0 POP-UP TURF ROTOR HEAD	1.0, 1.8, 3.7	40	30 FT
HUNTER	I-20-HP-ADS/36S W/ NOZZLES 1.5/3.0/6.0 POP-UP TURF ROTOR HEAD	1.4, 2.4, 4.9	40	35 FT
HUNTER	I-20-HP-ADS/36S W/ NOZZLES 2.0/3.5/8.0 POP-UP TURF ROTOR HEAD	1.8, 3.0, 6.0	40	40 FT
HUNTER	I-40-ADS/36S W/ NOZZLE 43 POP-UP TURF ROTOR HEAD	13.5	50	56 FT

NOTE:
NOZZLES NUMBERS WITHIN THE ROTOR HEAD SYMBOLS TO NOT EXACTLY CORRESPOND TO THE HUNTER NOZZLE NUMBERS. NOZZLE NUMBERS FOR QUARTER, HALF, AND FULL HEADS ARE SHOW WITHIN THE HEAD MODEL NUMBER AS SHOWN IN THE LEGEND.

MANUFACT.	MODEL NO. / DESCRIPTION
HUNTER	HC-75F-75M SERIES CHECK VALVES INSTALLED BELOW ALL ROTORS W/ELEVATION CHANGE GREATER THAN 10 FEET FROM HIGHEST HEAD IN ZONE
P.O.C.	RECLAIMED WATER METER, VERIFY SIZE, LOCATION, AND STATIC WATER PRESSURE IN FIELD
HAYWARD	MODEL #72 BASKET STRAINER 2" - 8" SIZE W/ FLANGED CONNECTIONS AND 80 MESH FILTER ELEMENT
U.G.T.	BARRETT IRRIGATION BOOSTER PUMP, BEP/XX/XX/XX/230/X/X/X, SEE DETAIL. INSTALL PER MANUFACTURERS RECOMMENDATION. ASSEMBLED BY UNITED GREEN TECH, LAGUNA HILLS, CA CONTACT DARYL GREEN (800) 427-0779
GRISWOLD	MODEL 2230 11/2" 'EPOXY FUSED' NORMALLY CLOSED PRESSURE REGULATING MASTER CONTROL VALVE
RAIN MASTER	FS-150 FLOW SENSOR, INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND WIRE TO CONTROLLER
WATTS	B-6080-SS-SH FULL PORT BRONZE VALVE, STAINLESS STEEL BALL, STEM AND HANDLE USE ON 2" MAINLINE AND SMALLER, LINE SIZE UP TO 2"
MATCO	B-4 BUTTERFLY VALVE WITH B4-LTCH LATCH NUT AND B4-IND INDEX PLATE, 3" THROUGH 10" TO MATCH MAINLINE SIZE
HUNTER	HQ-44-LRC-AW QUICK COUPLER VALVE
HUNTER	ICV-XX1G-AS (1", 11/2", 2") SERIES PRESSURE REGULATED PLASTIC REMOTE CONTROL VALVE, SIZE AS SHOWN INSTALL WITHIN VALVE MANIFOLD (SIZE MANIFOLD TO MATCH LARGEST LATERAL LINE IN MANIFOLD) WITH WATTS B-6080-SS-SH BALL VALVE (SIZE BALL VALVE TO MATCH LARGEST RCV IN MANIFOLD)
HUNTER	ICV-XX1-FS (1", 1 1/2") SERIES DRIP REMOTE CONTROL VALVE ASSEMBLY , SIZE AS SHOWN, INSTALL AG PRODUCTS 1" #4E 200 MESH WYE FILTER AND SENNINGER PRESSURE REGULATOR PMR-40MF FOR DEMANDS LESS THAN 18 GPM, AG PRODUCTS 11/2" SIZE #4E 200 MESH WYE FILTER AND SENNINGER PRESSURE REGULATOR PR-40HF PRESSURE REGULATOR FOR DEMANDS GREATER THAN 18 GPM. INSTALL BOTH ON THE DOWNSTREAM SIDE OF EACH DRIP RCV
RAIN MASTER	DX-48-RETRO-DX-FLOW 48 STATION IRRIGATION CONTROLLER WITH FLOW SENSOR OPTION, REMOTE RECEIVER KIT, SIZE AS SHOWN, INSTALLED WITHIN STAINLESS STEEL ENCLOSURE. (SEE BELOW FOR TYPE)
V.I.T.	SB-18SS STRONGBOX STAINLESS STEEL CONTROLLER ENCLOSURE WITH CSA SUB-ASSEMBLY, RGVRSS, AND QP-18
W.C.S.	RAIN SENSOR, RG/RG-VR, MOUNT TO REAR OF ENCLOSURE AND WIRE TO CONTROLLER
N/A	230 VOLT (SINGLE/THREE) PHASE ELECTRICAL POWER FOR PUMP SYSTEM, PROVIDED BY ELECTRICIAN, VERIFY ACTUAL LOCATION IN FIELD
N/A	120 VOLT ELECTRICAL POWER, PROVIDED BY ELECTRICIAN, VERIFY ACTUAL LOCATION IN FIELD
TORO	RGP-2-12 DL2000 DRIP TUBING W/ .5 GPH EMITTERS 12" ON CENTER, INSTALL TUBING ROWS A MAXIMUM OF 16" APART IN SHRUB AREAS. ALL TUBING SHALL BE INSTALLED 4" BELOW FINISHED SOIL GRADE W/ 9" WIRE STAKES FIVE (5) FEET ON CENTER; VERIFY THE LAYOUT AND SPACING IN THE FIELD PRIOR TO STARTING WORK
AG PROD.	S3TS "SPIN-LOC" TEE OR ELL FITTING FOR CONNECTION BETWEEN PVC LATERAL LINES AND DRIP TUBING
AG PROD.	ALL CONNECTIONS BETWEEN DRIP TUBING SHALL BE MADE USING "SPIN-LOC" FITTINGS

IRRIGATION GUIDELINES | EQUIPMENT LIST

MANUFACT.	MODEL NO. / DESCRIPTION
TORO	PROVIDE A FCH-H AUTOMATIC FLUSH VALVE AT END/MIDDLE OF DRIPLINE 3/4" PCV FLUSH MANIFOLD LINE, INSTALL FLUSH VALVE INSIDE A SEPARATE VALVE BOX, ONE AT THE END OF TUBING RUNS IN EACH DIRECTION. INSTALL MIN. ONE FLUSH VALVE PER 1000' OF TUBING IN EACH DIRECTION ON DRIPLINE FLUSH MANIFOLD. INSTALL 18" FROM PAVING. INSTALL ALL FLUSH EQUIPMENT PER MANUFACTURER'S SPECIFICATIONS.
TORO	YD-500-34 AIR/VACUUM RELIEF VALVE INSTALLED WITH A FT-050 COMBINATION TEE AND A 3/4" X 1/2" REDUCER BUSHING, INSTALL AIR RELIEF ASSEMBLY INSIDE A 6" ROUND VALVE BOX AT THE HIGH POINT OF EACH PLANTER, MIN. 1 ARV PER 500' OF DRIPLINE. USING AIR RELIEF LATERAL, CONNECT AIR RELIEF VALVE TO ALL DRIPLINE LATERALS WITHIN THE ELEVATED AREA. MULTIPLE ARV'S SHALL BE REQUIRED PER RCV WITHIN UNDULATING AREAS, VERIFY QUANTITY PRIOR TO STARTING WORK, INSTALL VALVE BOX 18" FROM PAVING AND AT HIGH POINTS OF PLANTER AREA. INSTALL ALL AIR VACUUM RELIEF EQUIPMENT PER MANUFACTURER'S SPECIFICATIONS.
AS APPROVED	UVR PVC PIPE 3/4" - 3" SCH. 40 AS LATERAL LINES ON GRADE STAKE PIPE AT 8' O.C. USING #4 REBAR J-HOOKS
AS APPROVED	PVC PIPE 3/4" - 3" SCH 4 AS LATERAL LINES 12" BELOW GRADE
AS APPROVED	PVC PIPE 2-21/2" CL. 315 3"-10" CL. 200 BELL AND GASKET AS MAINLINES 18"-24" BELOW GRADE
AS APPROVED	PVC PIPE SCH. 40 AS SLEEVING, TWICE THE DIAMETER OF PIPE OR WIRE BUNDLE CARRIED PLACE BELOW ALL PAVING, HARDSCAPE, ETC., AND AS DIRECTED BY OWNER'S AUTHORIZED REPRESENTATIVE.
AS APPROVED	11/4" SCH. 40 ELECTRICAL CONDUIT FOR FUTURE CENTRAL CONTROL COMMUNICATION CABLE, PROVIDE COMMUNICATION CABLE PULL BOX AT A MAXIMUM OF 200 FEET ON CENTER, AT EACH FIELD SATELLITE LOCATION, AT EACH CHANGE IN DIRECTION. PROVIDE A 1/4" NYLON PULL ROPE WITHIN CONDUIT. PROVIDE A MINIMUM OF 18" COVER.
AS APPROVED	IRRIGATION CONTROL WIRE #14UF AWG DIRECT BURIAL (U.L. APPROVED)
3M	DBY DIRECT BURIAL WATER-PROOF WIRE CONNECTORS FOR USE ON ALL WIRE CONNECTIONS
K.B.I.	KSC-XXX-S SWING CHECK VALVE, LINE SIZE, 1 DOWNSTREAM OF EACH RCV WHEN RCV IS LOWER THAN THE SPRINKLERS
K.B.I.	KC-XXX-S SPRING CHECK VALVE, LINE SIZE, 1 DOWNSTREAM OF EACH RCV IMMEDIATELY ABOVE FIRST LATERAL LINE TEE, WHEN RCV IS HIGHER THAN THE SPRINKLERS
LEEMCO	ALL FITTINGS USED WITH RING TITE PIPE SHALL BE LEEMCO "DEEP BELL" DUCTILE IRON FITTINGS. USE LEEMCO JOINT RESTRAINTS ON ALL DIRECTIONAL CHANGES AND ON COUPLINGS WITHIN 50 FEET OF DIRECTIONAL CHANGE. USE JOINT RESTRAINTS ON ALL EQUIPMENT INSTALLED ON RING TITE PIPE.

NOTE:
RECLAIMED WATER REQUIREMENTS ARE TO BE VERIFIED WITH THE WATER DISTRICT. TYPICALLY, A RECLAIMED WATER SYSTEM WILL INCLUDE:

- PURPLE CAPS ON IRRIGATION HEADS
- PURPLE IRRIGATION PIPES
- PURPLE VALVE BOXES
- RECLAIMED WATER TAGS ON VALVES
- RECLAIMED WATER WARNING HANDLE ON VALVES
- RECLAIMED SIGNAGE

ELECTRICAL SYSTEMS

Existing Site Power System Assessment

The Campus electrical service connection is provided by the Southern California Edison Company (SCE). The service point of connection is from the SCE 12KV overhead distribution system located on the West side of the Campus near the junction of Sand Canyon Road and Campus Drive. The 12KV SCE service runs underground along Campus Drive and terminates at an outdoor 2500KVA, 12KV/4160V SCE substation located on the outside of the Laboratory/Administration Building. This SCE substation serves the 3000A, 4160V Main Service Switchboard and Meter located in the main electrical room of the Laboratory/Administration Building. The main service switchboard has three fused switches serving the three main feeders which are distributed radially throughout the Campus.

Power is distributed at 4,160V via a system of underground cables in underground ducts, pull boxes, and manhole structures. The three main feeders feed all the buildings in the campus. Each building power service is typically tapped from the existing 500 Kcmil, 5KV feeders through a 5KV oil-filled fuse cut-out and step-down transformer. All existing buildings in the Campus have two transformers to step down the 4160V service voltage to 480/277V, 3-phase, 4-wire to feed all the lighting and mechanical equipment loads and 208/120V, 3-phase, 4-wire for all receptacle outlets, office equipment and small motor loads in the building.

The three main feeders from the main service switchboard are called out as circuits "A", "B", and "C". Circuit "A" serves the Library, Performing Arts Center, Student Services, College Center, Maintenance and Operations Building and the Child Development Center Building including one street lighting circuit. Circuit "B" serves the Laboratory/Administration building, Classroom, Bookstore, Occupational Education 1 & 2, Gymnasium, Satellite/T.V. Communication station, Clock Generator Station, and two street lighting circuits. Circuit "C" serves the Chemistry & Health Sciences building.

Circuits "A" and "B", per the load calculation shown on the as-built single line diagram, are at their full load condition. Circuit "C" is lightly loaded and has spare capacity available.

Information obtained from SCE showed that the previous 12 Months power demand of the Campus is at 60% of the SCE transformer capacity, which translates to an available spare capacity of approximately 1200KVA at 5KV or 1,440Amps at 480V, 3-phase.

Existing feeders are made up of single conductor, shielded copper 500kcmil rated at 5KV. In the 1990's these feeders were inspected and tested and partially replaced with new cable of the same size as shown on the as-built drawings. As part of the Master Plan scope of work, we had the opportunity to visually inspect and examine the existing feeders and found out that they are in good operational condition, although no testing was done. At the present time we will leave all existing feeders as is but will recommend that all existing feeders be inspected and tested when opportunity comes.

As part of the Master Planning exercise we also had the opportunity to assess all the existing building electrical systems and found that all electrical service equipment from the high voltage switch to the switchboard and panelboards in the building are antiquated and beyond their life expectancy. The electrical equipment is discontinued models with no available spare parts. The equipment is still operational and there is no immediate need for replacement. However as buildings are renovated, it is recommended that all electrical equipment in the building be first on the priority list to be replaced. Existing buildings will remain connected to existing feeders through the existing service conduit(s).

Master Plan

The Campus twenty-year master plan involves several new classroom buildings, a competition swimming pool and parking garage structures, and etc. The program also involves extensive and minor renovations of most if not all of the existing building in the Campus. Refer to the Architectural Master Plan for more information.

The Existing Campus distribution system is a simple radial system with a Main Switchboard and three circuits serving all the existing building. Two of the three existing circuits are fully loaded and cannot take any new load; the third circuit is lightly loaded and has spare capacity available. In order for the existing electrical infrastructure to support the Master Plan program the following is proposed:

Master Plan to 2012

For the proposed new LRC, Humanities 1, Parking Structure 1 located on the West side and Natatorium on the East side of the Campus, we will add two new circuits to the existing Main Switchboard to feed all future buildings on the campus. Two new additional fuse switch sections will be added to the existing main switchboard to accommodate the two new additional circuits. The two additional switchboard sections will fit in the existing electrical room where the existing main Campus switchboard is located. The new circuits from the main switchboard in the electrical room of the Laboratory/ Administration Building will be routed to utilize existing manholes and existing spare conduits along with new manholes and new underground duct banks to serve the future buildings on the East and West side of the Campus. New underground duct banks and new manholes will match the existing manholes and conduit sizes.

New underground duct banks will be routed along the Main Utilities Corridor in the campus. Three 500 kcmil, single conductor copper cable rated 5KV will be the standard feeder size for circuit run to match existing. Three 2/0 single conductor copper cable rated at 5KV will be the standard minimum size conductor to feed the new or renovated buildings.

The Campus distribution system is a simple radial system. Cable fault in one feeder will render the connected facilities without power until the faulty cable is replaced, a major disadvantage of a radial distribution system. To minimize power service downtime due to fault in the cable, we will use non-loadbreak elbow connectors with test point and fault indicators. The non-loadbreak elbow connectors will be installed in all new manholes.

The 2012 Electrical Infrastructure Plan shows the routing of feeders to feed the new buildings. Routing of new underground ducts as mentioned above will be routed along the new campus utilities corridor. New under ground ducts will include two 4" spare conduits for future use.

As part of the Master Planning to 2012, existing buildings including College Center, the Classroom Building (to become Student Services), the Library (to become the Student Center), and Occupational Education will be heavily renovated. In the assessment done on existing buildings we made recommendations that all existing electrical equipment in the building should be replaced when the opportunity comes; therefore all existing electrical equipment in all buildings to be renovated will be replaced including the existing high voltage incoming feeder. A new High Voltage switch, new step down transformer, new main building switchboard and new panelboards will be installed in each building, as well as new service conductors in existing service conduit(s).

Master Plan to 2025

In the second half of the Campus Master Plan up to 2025, new buildings such as Administration/Student Services Building, Humanities 2, Science Building, Wellness Center, Community Building, Child Development Center 3 and Parking Structure 2 will be built on the campus. Renovations of Student Services A and B, Laboratory/Administration, Chemistry/Health Science, Gymnasium, renovations and addition to the Performing Arts Center, and the Maintenance and Operations Building will also take place in this phase of the Master Plan.

Evaluation, analysis, and calculation of the existing and future loads were undertaken to find out if the existing capacity of the Campus Main Switchboard is sufficient to accommodate the Campus upgrade to 2025. Based on the electrical loads of existing buildings and the preliminary load information available for the new buildings we found out that the existing main switchboard have the capacity to handle the new and renovated buildings and still have spare capacity available.

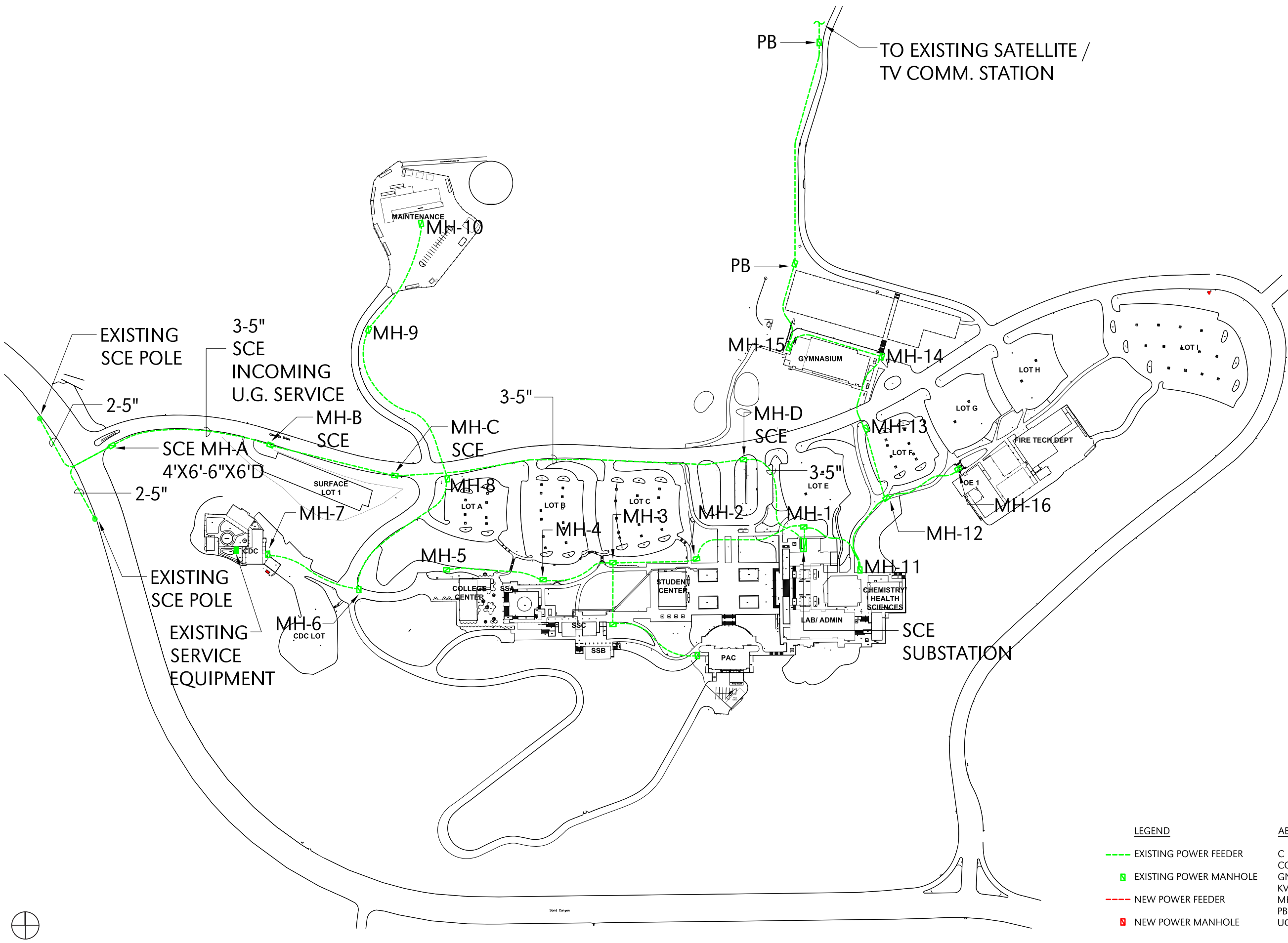
The two new feeders added during the 2012 upgrade will be extended and will accommodate the additional new buildings. Stub out conduits in the underground duct banks for extension to this phase of the upgrade were included during the first phase. New underground manholes and extension of underground ducts are shown on the 2025 Electrical Infrastructure Master Plan to serve the new buildings in this phase of the upgrade.

The same strategies in connecting the new and renovated buildings in the campus electrical distribution system are as described in the first phase (2012) of the campus upgrade.

Summary

- Existing main switchboard have the capacity to support existing building renovations and new buildings up to year 2025.
- The available spare capacity on circuit "C" will remain as spare.
- Additional two new switchboard sections will be provided in the existing main switchboard to accommodate two new feeder circuit breakers to serve all new buildings on the Campus.
- Additional new 4" conduits to existing underground ducts will be installed to accommodate new feeders and to provide minimum of two 4" spare conduits.
- Additional new manholes will be installed to extend duct banks to new building locations as shown on plans. Stub-out conduit from new manholes to the extent of hardscape will be installed for future extension to new building.
- Buildings for renovation will have new service equipment and new high voltage feeders to replace all existing equipment and feeders, while reusing existing service conduit(s).
- New fire alarm and security systems will be included in the campus upgrade.

ELECTRIC | EXISTING



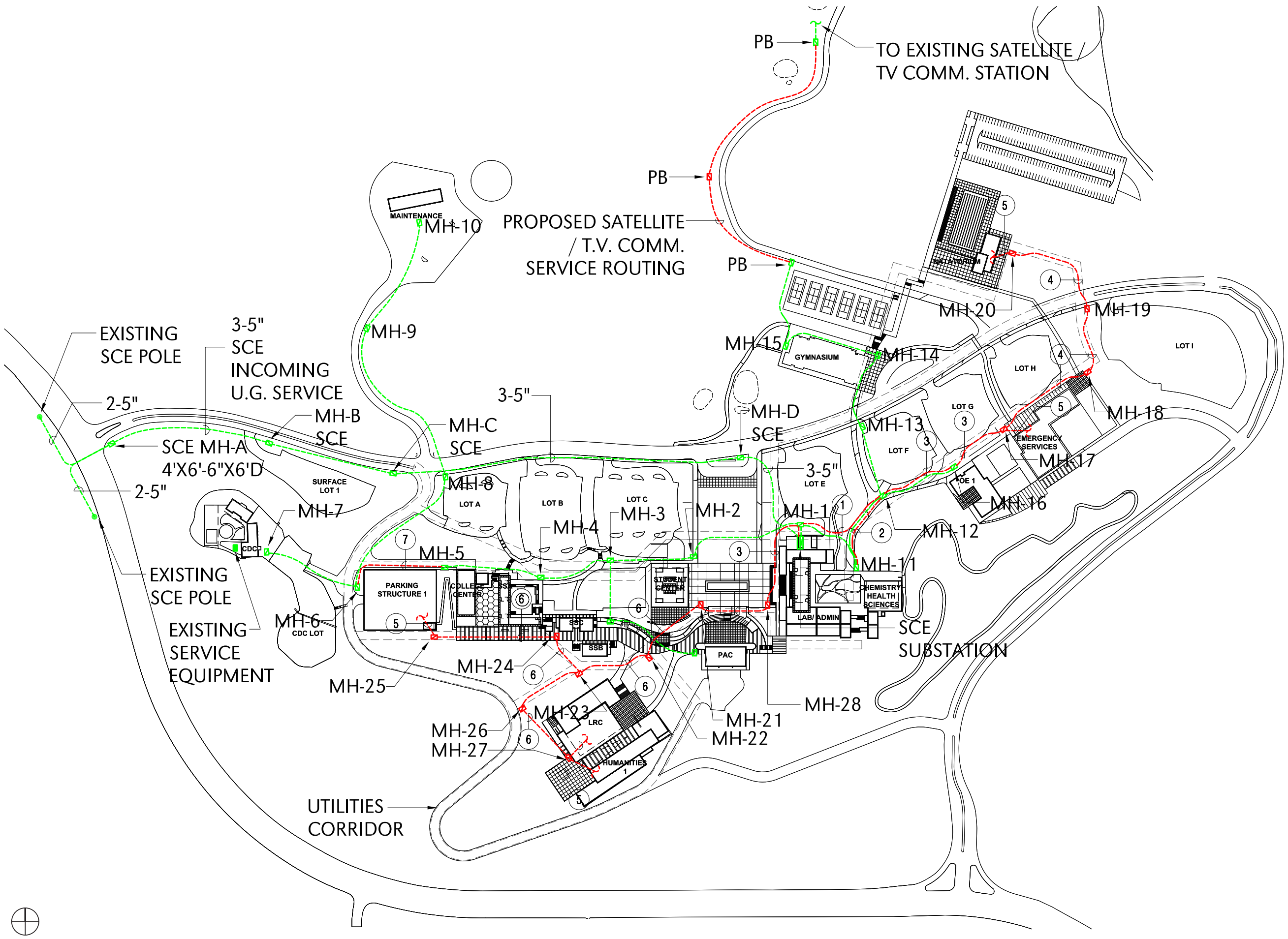
LEGEND

- EXISTING POWER FEEDER
- EXISTING POWER MANHOLE
- NEW POWER FEEDER
- NEW POWER MANHOLE

ABBREVIATIONS

C	CONDUIT
CO	CONDUIT ONLY
GND	GROUND
KV	KILOVOLT
MH	MANHOLE
PB	PULLBOX
UG	UNDERGROUND

ELECTRIC | 2012



GENERAL NOTES:

1. ALL NEW CONDUITS WILL BE LOCATED IN THE CAMPUS UTILITY CORRIDORS
2. ALL NEW UNDERGROUND POWER MANHOLE SHALL BE 4'X6'-6"X6' DEEP TO MATCH EXISTING.
3. ALL EXISTING ELECTRICAL EQUIPMENT IN THE EXISTING BUILDING SCHEDULED FOR RENOVATION SHALL BE REPLACED WITH ALL NEW ELECTRICAL EQUIPMENT.
4. ALL FEEDER CONDUCTORS ARE RATED AT 5KV AND SINGLE CONDUCTOR COPPER CABLE.

REFERENCE NOTES:

1. FEEDER "E" FROM EXISTING SWBD. (1) 4"C., 3#500KCMIL & 1#4 GND, AND (1) 4"C.O. SPARE CONDUITS.
2. NEW (2) 4"C.O. SPARE.
3. (1) 4"C., 3#500KCMIL 5KV & 1#4 GND FOR FEEDER "E" AND (2) 4"C.O. SPARE CONDUITS.
4. (1) 4"C., 3#500KCMIL 5KV & 1#4 GND FOR FEEDER "E" AND (3) 4"C.O. SPARE CONDUITS.
5. (1) 3"C., 3#2/0 5KV & 1#4 GND FEEDER CONDUCTORS AND (1) 3"C.O. SPARE CONDUIT STUB-UP IN THE BUILDING ELECTRICAL ROOM.
6. (1) 4"C., 3#500KCMIL 5KV & 1#4 GND FOR FEEEDER "D" AND (3) 4"C.O. SPARE CONDUITS.
7. NEW (2) 4"C.O. AND (2) 3"C.O. ROUTED IN THE UTILITIES CORRIDOR TO ACCOMODATE RE-ROUTING OF EXISTING CIRCUITS AFFECTED BY FUTURE PARKING STRUCTURE 1.

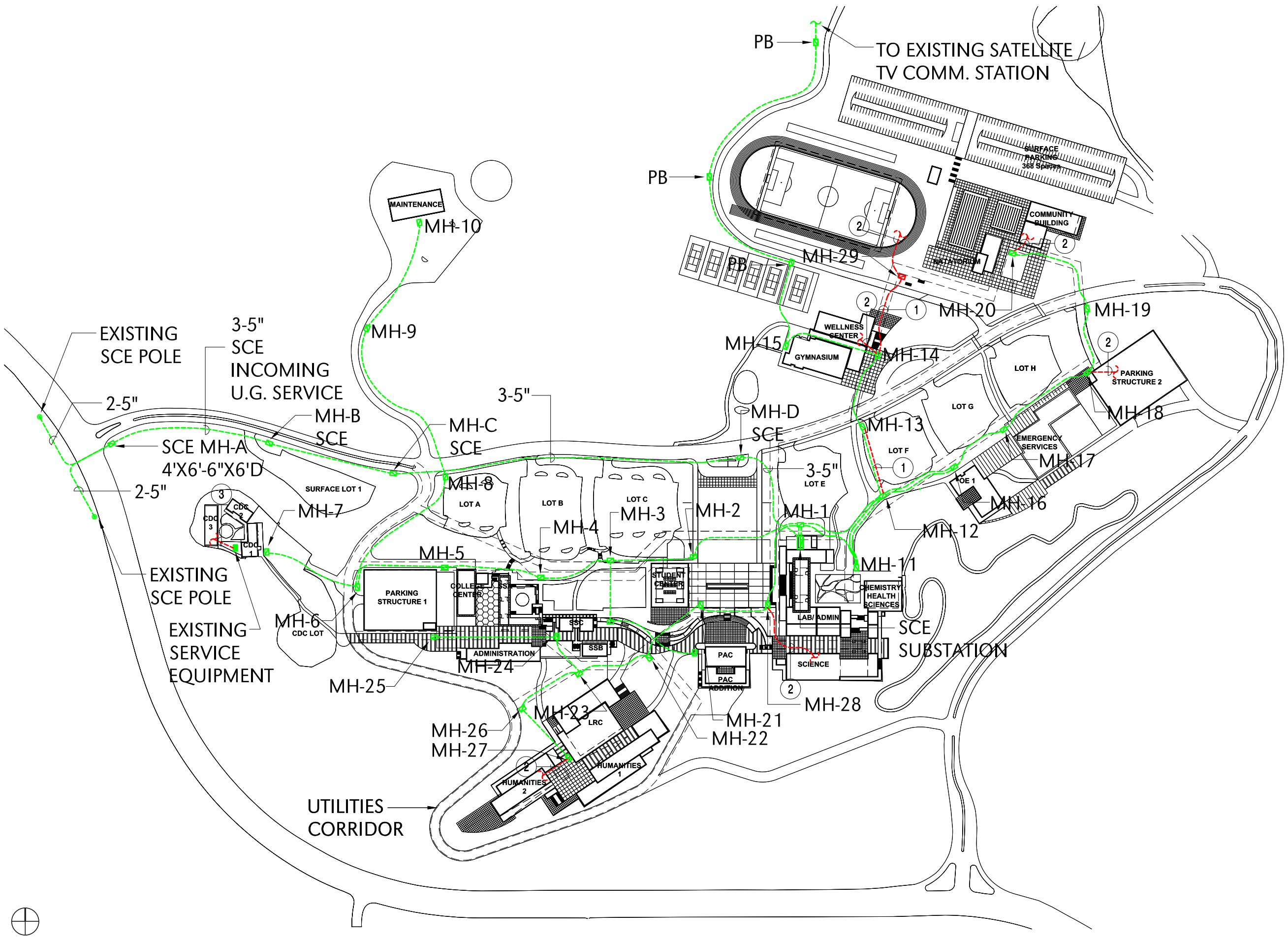
LEGEND

- EXISTING POWER FEEDER
- EXISTING POWER MANHOLE
- NEW POWER FEEDER
- NEW POWER MANHOLE

ABBREVIATIONS

C	CONDUIT
CO	CONDUIT ONLY
GND	GROUND
KV	KILOVOLT
MH	MANHOLE
PB	PULLBOX
UG	UNDERGROUND

ELECTRIC | 2025



GENERAL NOTES:

1. ALL NEW CONDUITS WILL BE LOCATED IN THE CAMPUS UTILITY CORRIDORS
2. ALL NEW UNDERGROUND POWER MANHOLE SHALL BE 4'X6'-6"X6' DEEP TO MATCH EXISTING.
3. ALL EXISTING ELECTRICAL EQUIPMENT IN THE EXISTING BUILDING SCHEDULED FOR RENOVATION SHALL BE REPLACED WITH ALL NEW ELECTRICAL EQUIPMENT.
4. ALL FEEDER CONDUCTORS ARE RATED AT 5KV AND SINGLE CONDUCTOR COPPER CABLE.

REFERENCE NOTES:

1. (1) 4"C., 3#500KCMIL & 1#4 GND AND (1) 4"C.O. SPARE CONDUIT.
2. (1) 3"C., 3#2/0 5KV & 1#4 GND FEEDER CONDUCTORS AND (1) 3"C.O. SPARE CONDUIT STUB-UP IN THE BUILDING ELECTRICAL ROOM.
3. (2) 2"C., 3#4/0 & 1#2 GND FROM EXISTING SERVICE EQUIPMENT TO THE ELECTRICAL ROOM IN NEW CDC 3.

LEGEND

- EXISTING POWER FEEDER
- EXISTING POWER MANHOLE
- NEW POWER FEEDER
- NEW POWER MANHOLE

ABBREVIATIONS

C	CONDUIT
CO	CONDUIT ONLY
GND	GROUND
KV	KILOVOLT
MH	MANHOLE
PB	PULLBOX
UG	UNDERGROUND

CAMPUS GAS SYSTEM

Campus Master Gas Meter

General Description

- The existing master gas meter is located on West Side of the Crafton Hills College Campus at an above ground exterior location exposed to the weather (see photo on 5.37).
- The gas meter is part of a service assembly provided by the Southern California Gas Company. High pressure gas (range of 15 to 50 psig) is supplied to the meter by Gas Company. Gas Company's gas pressure regulators further reduces the pressure to 5 psig. Natural gas systems at buildings are reduced to low pressure gas (Maximum of 11 inches of water column) via gas regulator (GPR) outside of each buildings.

Piping

- The size of main gas pipe above ground is a 6". The pipe appears to be black steel and is in fair condition.
- The main 6" metal pipe descends underground and delivers gas to the Campus.

Existing Campus Natural Gas Demand

See table 9.

Future Development and Gas Load

Natural gas load for new buildings for each construction phase year 2012 and 2025 are shown in tables 10 and 11.

- Ultimate natural gas load through year 2025 will be 40,332 CFH and the developed length from the gas meter to the furthest building will be 2900 feet.
- For the above ultimate gas load the 6" main at 5 PSI is adequate. This pipe size can handle a maximum of 66,500 CFH.

Recommendations

- According to the maintenance personnel, the newly installed boiler in the central plant at the Laboratory/Administration building is starving for gas. It seems that ample gas capacity can be delivered in the existing underground piping to building #1. This building is fed with a five inch line; which is adequate for the gas load of this building. We recommend consulting the boiler manufacturer for equipment performance and installation procedure.
- Prior start of any gas piping replacement work, contractor to inform gas company to up date the existing meter to have the ability to deliver 37,000 CFH gas, 5 PSI at 2900' developed length.
- Install new underground gas piping, size to match the gas load for year 2025 as shown on the plans.
- Install branch gas piping to existing building's gas pressure regulators, size to match existing branches and connect to new mains.
- Existing gas mains and branches to the buildings shall remain in service until the new branch lines are connected to the existing gas pressure regulators.
- Abandon in place all existing gas piping. No open end piping shall remain underground. All open end existing piping shall be capped.
- Gas master plan has been developed in two phases, they are: Phase I through year 2012, Phase II through year 2025.

Table 9 - Existing Natural Gas Demand

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	CUBIC FEET PER HOUR
1	LABORATORY/ ADMINISTRATION	38,205	9,990
2	LIBRARY/ LEARNING RESOURCES	37,535	–
3	COLLEGE CENTER	10,515	5,855
4	STUDENT SERVICES A	10,855	
5	CLASSROOM BUILDING	7,110	–
6	OCCUPATIONAL EDUCATION 1	9,745	700
7	OCCUPATIONAL EDUCATION 2	34,104	900
8	PERFORMING ARTS CENTER	32,715	–
9	MAINTENANCE & OPERATIONS	14,286	1159
10	GYMNASIUM	17,930	1980
12	CHEMISTRY	17,270	250
13	CHILD DEVELOPMENT CENTER 1	3,970	409
14	CHILD DEVELOPMENT CENTER 2	2,685	274
16	STUDENT SERVICES B	5,745	–
17	BOOKSTORE	53,500	600
18	CLASSROOMS AT BOOKSTORE	24,369	600
	TOTALS		22,717

Table10 - 2012 New Buildings Natural Gas Demand

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	SPACE HEATING (CFH)	DOMESTIC WATER HEATING (CFH)
7	EMERGENCY SERVICES (OE2 replacement building)	24,104	800	100
20	LEARNING RESOURCE CENTER	53,500	2,000	200
21	HUMANITIES 1	24,400	1,225	100
25	COMMUNITY RECREATIONAL FACILITY	7,000	750	4,100
	TOTALS		4,775	4,500

Table 11 - 2025 New Buildings Natural Gas Demand

BLDG. NO.	BUILDING NAME	BUILDING AREA (GSF)	SPACE HEATING (CFH)	DOMESTIC WATER HEATING (CFH)
9	MAINTENANCE & OPERATIONS	14,286		
11	WELLNESS CENTER	24,475	890	100
15	CHILD DEVELOPMENT CENTER EXPANSION	12,118	50	50
19	ADMINISTRATION/ STUDENT SERVICES	27,713	450	100
22	HUMANITIES 2	44,531	2,625	200
23	PERFORMING ARTS CENTER EXPANSION	13,295	475	100
24	SCIENCES	36	2,350	400
26	COMMUNITY CENTER	15,000	575	75
	TOTALS		7,415	1,025

2012 Buildings

1. Humanities 1
• This building consists of public toilets, class rooms, computer labs and offices.
• Domestic cold water main will be 2-1/2" and hot and cold water piping will be copper tubing.
• Where water pressure exceed 80 PSI, there will be a pressure reducing valve installed prior water entering the building.
• Waste, vent and storm drain piping will be cast iron service weight piping.
• Roof drains and overflow drains will be each piped separately to approved receptors.
• Water closets will be wall hung, flush valve, American Standard or Kohler.
• Medium pressure gas will be reduced to low pressure gas via a gas pressure regulator outside of the building. Gas will run into the building with schedule 40 black steel pipe to support the domestic water heater and HVAC equipment.
• Low pressure gas, schedule 40 black steel pipe will enter the building. Gas will be piped to domestic water heater and to HVAC equipment that are requiring gas supply.
• A 100-gallon water heater with circulating pump and expansion tank will be adequate to serve the domestic hot water requirement.

2. Learning Center (LRC) Building
• This building consists of small toilet rooms, class rooms and small kitchen.
• Domestic cold water main will be 2" and hot and cold water piping will be copper tubing.
• Where water pressure exceed 80 PSI, there will be a pressure reducing valve installed prior water entering the building.
• Waste, vent and storm drain piping will be cast iron service weight piping.
• Roof drains and overflow drains will be each piped separately to approved receptors.
• Water closets will be wall hung, flush valve, American Standard or Kohler.
• Medium pressure gas will be reduced to low pressure gas via a gas pressure regulator outside of the building. Gas will run into the building with schedule 40 black steel pipe to support the domestic water heater and HVAC equipment.
• Low pressure gas, schedule 40 black steel pipe will enter the building. Gas will be piped to domestic water heater and to HVAC equipment that are requiring gas supply.
• A 50-gallon water heater with expansion tank will be adequate to serve the domestic hot water requirement.

HVAC
Air Handling Units
• Classroom and Office Air handling units shall be double wall unit and be located in a mechanical room.
• The units will be a Variable Air Volume air handling unit containing the following minimum components in a draw-through arrangement: supply air fan, chilled water cooling coil, pre-filter and final filter section, return air fan, outside air economizer, outside air, return and relief dampers and vibration isolators. Outside air and relief air will be ducted to and from the unit.
• Air is distributed and returned via four perimeter riser shafts. VAV boxes with terminal reheat will be provided for each 600 sq. ft. at the perimeter and 1,000 sq. ft. in the interior of the building. Dedicated VAV boxes will be provided for corner offices, classrooms and conference rooms. The ceiling void will be used as a return air plenum within the offices. Ducted return air will be provided in the classrooms.

3. Natatorium Building

• This building consists of a prefabricated swimming pool, public toilets, showers and locker rooms.
• Domestic cold water main will be 4" and hot and cold water piping will be copper tubing.
• Where water pressure exceed 80 PSI, there will be a pressure reducing valve installed prior water entering the building.
• Waste, vent and storm drain piping will be cast iron service weight piping.
• Roof drains and overflow drains will be each piped separately to approved receptors.
• Water closets will be wall hung, flush valve, American Standard or Kohler.
• Showers will be gang column type with stainless steel panel.
• Medium pressure gas will be reduced to low pressure gas via a gas pressure regulator outside of the building. Gas will run into the building with schedule 40 black steel pipe to support the domestic water heater and HVAC equipment.
• Low pressure gas, schedule 40 black steel pipe will enter the building. Gas will be piped to domestic water heater and to HVAC equipment that are requiring gas supply.
• Domestic water heater will be consists of a 1000-gallon storage tank with (2) water heaters each at 800,000 BTUH input together with expansion tank and circulating pump.
• Domestic hot water will be tempered via a mixing valve to 105 F for showers and 120 F for laundry and other use.

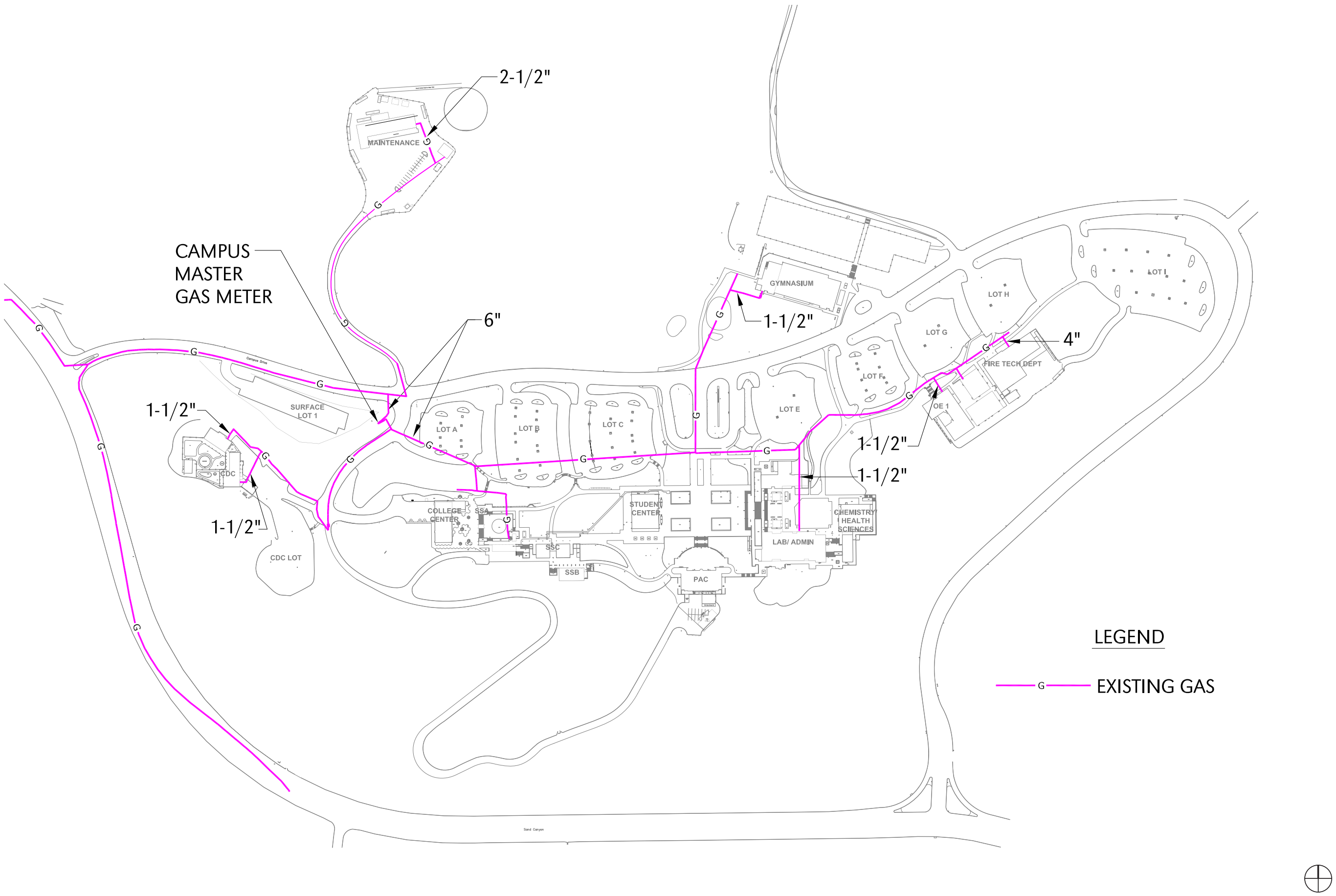
TABLE 12-6
Medium Pressure Natural Gas Systems for Sizing Gas Piping Systems
Carrying Gas of 0.60 Specific Gravity
Capacity of Pipes of Different Diameters and Lengths in Cubic Feet Per Hour for
Gas Pressure of 5.0 psi with a Drop 1.5 psi

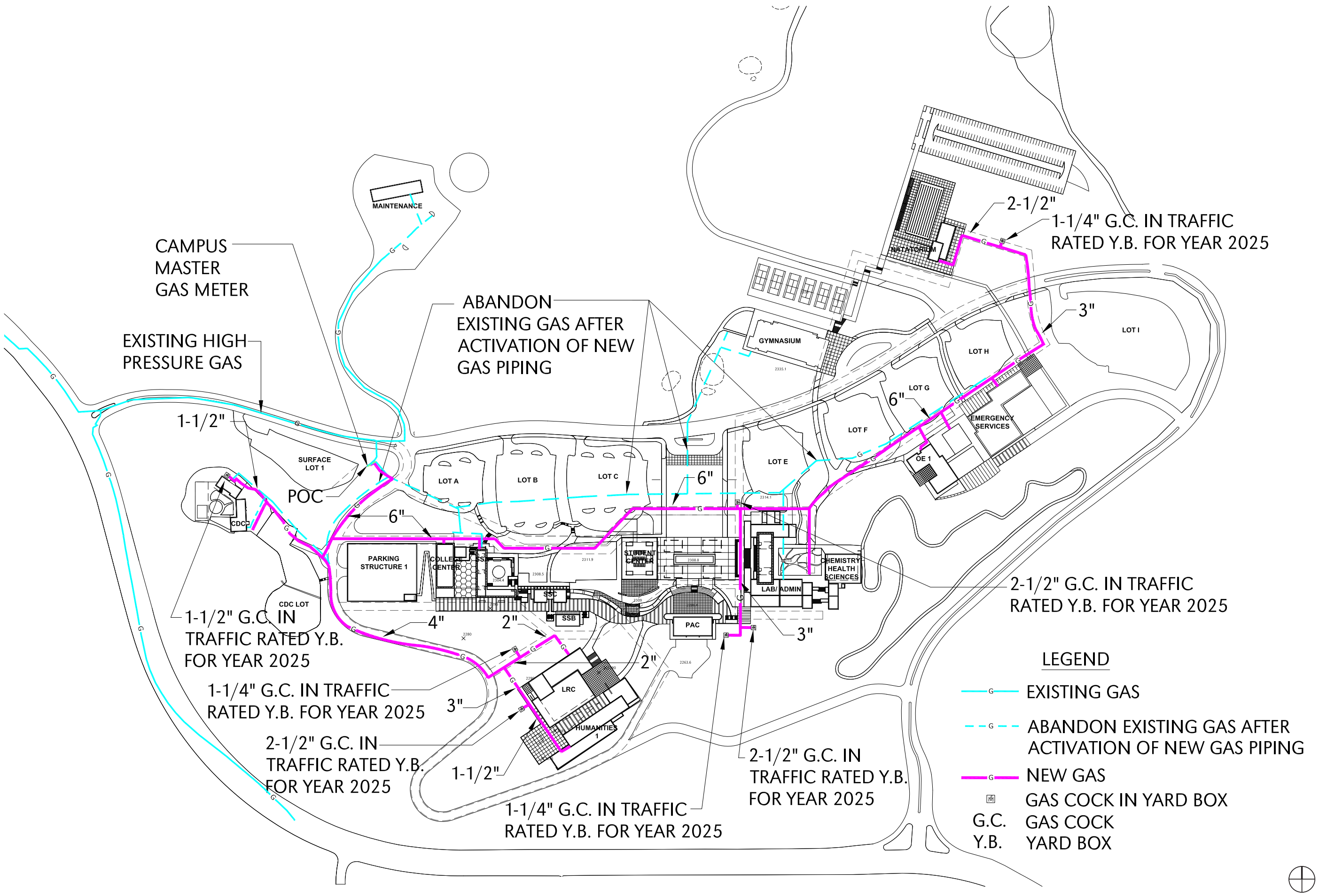
Length (Feet)

Pipe Size	**650**	**700**	**750**	**800**	**850**	**900**	**950**	**1000**	**1100**	**1200**	**1300**	**1400**
1/2	349	335	323	312	302	293	284	277	263	251	240	231
3/4	730	701	676	653	632	612	595	578	549	524	502	482
1	1375	1321	1273	1229	1190	1153	1120	1089	1035	987	945	908
1-1/4	2824	2713	2614	2524	2442	2368	2300	2237	2124	2027	1941	1865
1-1/2	4231	4065	3916	3781	3659	3548	3446	3351	3183	3037	2908	2794
2	8149	7828	7542	7283	7048	6833	6636	6455	6130	5848	5600	5380
2-1/2	12,988	21,477	12,020	11,608	11,233	10,891	10,577	10,288	9771	9321	8926	8575
3	22,960	22,057	21,249	20,520	19,858	19,253	18,698	18,187	17,273	16,478	15,780	15,160
4	46,830	44,990	43,342	41,855	40,504	39,271	38,139	37,095	35,231	33,611	32,186	30,921

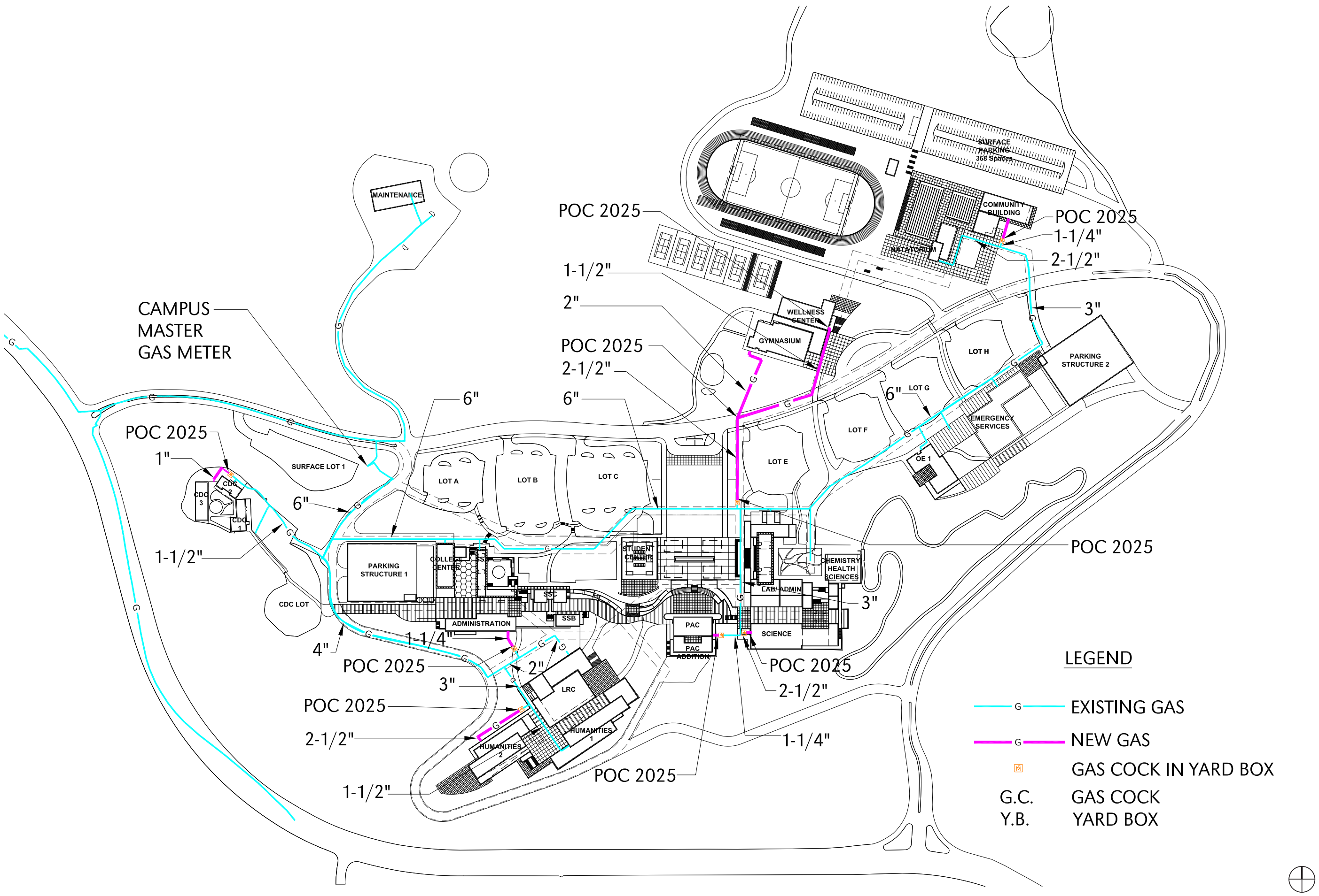
Pipe Size	**1500**	**1600**	**1700**	**1800**	**1900**	**2000**	**2100**	**2200**	**2300**	**2400**	**2500**	**2600**
1/2	222	214	208	201	195	190	185	181	176	172	168	165
3/4	464	449	434	421	409	398	387	378	369	360	352	345
1	875	845	818	798	770	749	729	711	694	678	664	650
1-1/4	1796	1735	1679	1628	1581	1537	1497	1460	1425	1393	1363	1334
1-1/2	2691	2599	2515	2439	2368	2303	2243	2188	2136	2087	2042	1999
2	5183	5005	4844	4696	4561	4436	4321	4213	4113	4020	3932	3849
2-1/2	8261	7978	7720	7485	7270	7071	6886	6715	6556	6406	6267	6135
3	14,605	14,103	13,648	13,233	12,851	12,500	12,174	11,871	11,589	11,326	11,078	10,846
4	29,789	28,766	27,838	26,991	26,213	25,495	24,831	24,214	23,639	23,100	22,596	22,121
5	53,892	52,043	50,363	48,830	47,422	46,124	44,923	43,806	42,765	41,792	40,879	40,021
6	87,263	84,269	81,550	79,067	76,787	74,686	72,740	70,932	69,247	67,671	66,193	64,803

GAS | EXISTING




CAMPUS MASTER GAS METER
EXISTING HIGH PRESSURE GAS
ABANDON EXISTING GAS AFTER ACTIVATION OF NEW GAS PIPING
MAINTENANCE
1-1/2"
POC
6"
SURFACE LOT 1
LOT A
LOT B
LOT C
6"
LOT E
LOT F
LOT G
LOT H
LOT I
6"
GYMNASIUM
NATATORIUM
2-1/2"
1-1/4" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
3"
EMERGENCY SERVICES
OE 1
CDC
CDC LOT
PARKING STRUCTURE 1
COLLEGE CENTER
STUDENT CENTER
LAB/ADMIN
CHEMISTRY HEALTH SCIENCES
2-1/2" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
PAC
3"
SSB
LRC
HUMANITIES
1-1/2" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
4"
2"
2"
1-1/4" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
3"
2-1/2" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
1-1/2"
1-1/4" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
2-1/2" G.C. IN TRAFFIC RATED Y.B. FOR YEAR 2025
LEGEND
EXISTING GAS
ABANDON EXISTING GAS AFTER ACTIVATION OF NEW GAS PIPING
NEW GAS
GAS COCK IN YARD BOX
G.C. GAS COCK
Y.B. YARD BOX

GAS | 2025



CAMPUS
MASTER
GAS METER
POC 2025
1-1/2"
2"
POC 2025
2-1/2"
6"
6"
POC 2025
1-1/4"
2-1/2"
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POC 2025
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POC 2025
POC 2025
2-1/2"
1-1/4"
MAINTENANCE
SURFACE LOT 1
LOT A
LOT B
LOT C
LOT E
LOT F
LOT G
LOT H
WELLNESS CENTER
GYMNASIUM
NATATORIUM
COMMUNITY BUILDING
PARKING STRUCTURE 2
EMERGENCY SERVICES
OE 1
PARKING STRUCTURE 1
COLLEGE CENTER
ADMINISTRATION
SSB
LRC
HUMANITIES 1
HUMANITIES 2
PAC
PAC ADDITION
SCIENCE
LAB/ADMIN
CHEMISTRY HEALTH SCIENCES
STUDENT COMMONS
CDC LOT
CDC 1
CDC 2
CDC 3
LEGEND
EXISTING GAS
NEW GAS
GAS COCK IN YARD BOX
G.C. GAS COCK
Y.B. YARD BOX

DATA & COMMUNICATIONS

Introduction

In this report, the proposed build out of the campus communications infrastructure consisting of the main campus equipment rooms, campus duct bank pathways and the campus communications cabling serving the College is discussed as an integral part of the Architectural Master Plan. The critical campus communications infrastructure upgrades that will have an impact on future installations of technology equipment and use are addressed. The goal of the proposed master plan campus communications infrastructure is to ensure sufficient IT capacity to serve the technology build out of the campus while also effectively serving the needs of the master plan development.

The specific focus on supporting technology across the campus is not for the sake of using technology. The effort is made to ensure that the College's technology infrastructure is adequate to allow new technologies to be used that will help the College address its ultimate needs and goals required to provide a quality education to its students.

The communications infrastructure incorporated into the master plan addresses long and short term needs with the following guidelines:

- Technology Changes – The infrastructure must support ongoing changes such as increased network speeds and capacities, expanded use of monitoring and control systems and personal communication services.
- Distribution – The infrastructure should enable access to every Campus building and every area of the Campus, providing redundant routing wherever practicable.
- Adaptability – The infrastructure should be designed to allow a high degree of flexibility and adaptability.
- Standards Based – The infrastructure should adopt a standards based approach to provide the capability to utilize a wide range of alternative system designs without the need to reinvent the basic infrastructure.
- Fault Tolerance – The infrastructure should be designed to allow for the installation of a fault tolerant network configuration.

Incoming Services

The campus currently has hardwired incoming service connections provide by Verizon. The incoming services connections are made with 24 strands of optical fiber and 300 pair of copper cabling extended from Verizon's Mentone Central Office location. The incoming service route runs from the west entrance at Sand Canyon Road to the Library/LRC building for fiber connections and to the LADM building for copper connections. The incoming service lines are used to distribute Internet and telephone system connections.

As part of the master plan efforts the incoming service routes will be relocated in a small section of the existing duct bank but, the campus connection points will remain in the Library and LADM buildings. The routing of incoming services near the College Center will be relocated due to the grading and future construction of a parking lot to be located just west of the College Center. A new conduit pathway will be constructed and connected to existing maintenance hole locations. After the conduit is in place the existing cables and air blown fiber cells will be spliced. This cut-over will require a phone service and Internet connection disruption of approximately three days. Verizon will have to be contacted to coordinate the splicing of their cables by their service technicians.

As part of this duct bank relocation and cable splicing it is recommended that the amount of incoming Verizon copper lines be reduced by at least 50%. The need for copper lines has been reduced since the installation of a campus-wide Voice of IP system used for telephone service. This reduction in incoming copper cables will also increase the capacity in a section of the main communications infrastructure backbone pathway allowing for future cable installations in these areas. It is also recommended that any abandoned cabling be removed from this main infrastructure pathway during this relocation effort and any master plan cabling installations.

It is recommended that the MPOE locations remain in place in order to avoid costs for the installation of a new dedicated Verizon duct bank and cable installations. Existing MPOE locations are in good working order and provide adequate services to the campus. Connections from the existing MPOE locations and incoming signaling will be extended to the new campus data center location.

Campus Main Technology Equipment Rooms

The following is a list of main technology equipment rooms that will be used to serve the campus as part of the proposed master plan:

- Data Center (New room to be located in the future LRC building. This is a purpose built data center that will serve the campus for the next 20 years.)
- Redundant Core Equipment Room (The existing Data Center will be used as a redundant equipment room that will house the DS-3 equipment, redundant core switch, redundant servers and redundant data storage equipment. Room shall be upgraded to provide equipment protection from potential water damage by leakage of existing plumbing and fire sprinkler pipes.))

• MPOE Optical Fiber (The existing Data Center will continue to be the location for the optical fiber connection for the campus from Verizon. A dedicated optical fiber connection will run from the DS-3 equipment in this room to the new Data Center location for delivery of Internet to the campus data network.)
• MPOE Copper (The existing communications equipment room in the LADM building will be continue to be the location for incoming services copper cable terminations.)

Data Center
As part of the campus master plan improvements a new campus data center will be constructed in the future LRC building. The new data center will provide a "state of the art facility" for the Campus data network, telephone and low voltage technology systems. Crafton Hills College has become increasingly reliant on the use of technology with the use of its Voice of IP telephone system and on-going data network usage. It is expected that the reliance on technology will only continue to increase justifying the need for a properly built data center. The data center will be a 24 hour 7 day a week facility with redundant power and mechanical systems. The facility will be designed to support future equipment expansion and is expected to support the campus needs for more than twenty years. The existing data center will remain as a redundant core equipment location providing network redundancy.

The performance requirements for the new Data Center are as follows:

Architectural Requirements
- Estimated Room Size – 1,200 square feet.
- Architectural finishes will comprise raised floor system and a standard drop ceiling with lighting positioned over each aisle.
- Double door entry to Data Center and from building entry location. Access shall support the delivery and installation of large equipment with a minimum turning radius of 6'.

Resilient and Redundant Systems
The systems will be designed to maintain data room environmental conditions in compliance with the performance criteria with 99.9% reliability under all foreseeable and unforeseeable circumstances including:
- Data center system maintenance, breakdown, repair & replacement.
- Building system maintenance, breakdown, repair & replacement.
- Utility brownout & interruption, system maintenance, breakdown, repair & replacement.

Not withstanding the foregoing description of performance, the following levels of system resilience and redundancy will be provided.

Electrical
- Redundant power routing direct to the data room.
- Tie to building's emergency generator, direct routing to data center, supports network equipment (and restricted air conditioning), online within 60 seconds.
- Existing UPS equipment to be reused providing parallel (maintenance) bypass, isolation from raw utility power and 30 minute battery capacity at full load.
- Existing UPS equipment to provide network based power management for automatic server control, automatic fault reporting via network and dial out, and to be SNMP enabled for computer integration.
- PDU with duplicate isolation transformers feeding redundant switchgear and panel boards. Two individual 30A circuits, to serve each equipment rack/cabinet will be required. Provide 120V supplies throughout and 208 Volt at predetermined locations. PDUs in Data Center to allow individual circuits to be activated / deactivated remote from the equipment rack/cabinet.
- Receptacles to be fixed to overhead cable tray, with conduits running up to ceiling level to maintain power / communications cabling separation.
  - In addition to the conditioned equipment power, convenience receptacles will be required in the data center and associated areas.
  - An emergency protected power-off button shall be provided at each exit.
  - Provide signal ground bus bar throughout the data center.

Mechanical
- Multiple, dedicated, data room specification up-flow a/c units. The system should comprise not less than independent three units, sized such that two units will maintain design conditions within the specified range and located such that maintenance and repair will not disrupt data center operation. (Note: The building's a/c may be used as one of the three systems supporting cooling in the data room.)
- Air filtration
- Drip trays with moisture detectors located under pipes running in ceiling void above data center location.
- An HVAC System Control Panel shall be provided at the main entrance to the Data Center.

Fire Protection
- o Fire alarm system with heat and smoke detectors.
- o Multi-zone, pre-action, dry pipe fire suppression system.
- o In addition, an FM200, CO2 or equivalent system will be considered as an option.
- o A Fire Alarm Control Panel will be provided at main entrance to Data Center.

Environmental Sensors and Alarms
- o Fire: Smoke and heat detectors at ceiling level. Detector monitor panel at main entrance to Data Center and at 24-security location.
- o Moisture detectors around perimeter and in ceiling drip trays.
- o Automatic notification, via phone, page and email.

Seismic
- o All seismic provisions (mounting, restraint, connections, etc) to be as required in critical services facilities (hospitals, emergency services etc).

Campus Communications Infrastructure

The campus communications infrastructure consists of duct banks, maintenance holes and pull boxes used to distribute communications and low voltage cabling for the use of data network, telephone, emergency phones, and other low voltage services across the Crafton Hills campus. The following sections identify the master plan approach for the development of the communications infrastructure. As part of the master plan the goal of the infrastructure design is to provide adequate and redundant pathways that support connections to each existing and future building locations on campus.

Campus Communications Pathways

The existing campus communications cabling pathways consist of conduit duct banks, maintenance holes and pull boxes. Access at infrastructure pathways is made at maintenance holes and pull boxes for cable servicing and installations. Duct banks consist of 3 or 4 inch trade size conduits running between backbone manhole and pull box locations. The proposed master plan communications pathways make use of the existing pathways. Additional pathways will extend from the existing central spine pathway creating two duct bank loops that will provide pathway redundancy. The two main loops will support the east and west ends of the campus. The loops originate from the campus Data Center to be located in the new LRC building. The duct bank pathways will mainly consist of (6) 4" conduits encased in slurry and used for the distribution of copper and optical fiber cabling supporting data network, telephone, security, fire alarm and the remaining campus low voltage systems. The duct bank has been sized to support the existing buildings and new buildings identified as a part of the Master Plan and to provide future capacity and flexibility. The infrastructure design is based on a redundant loop topology in order to reduce the likelihood of a single point of failure.

See table 12 for estimated master plan communications infrastructure installations; it is intended to be used for budgeting purposes.

Table 12 - Communications Infrastructure

Item	Description	Quantity	Remarks
Conduit	(6) 4" conduits encased in slurry	4,300	Quantity per lineal foot
Pull Boxes	3' x 5' x 4' precast with traffic lid	6	
Maintenance holes	6' x 10' x 7'	12	
Trenching	Minimum 24" below grade	4,300	Quantity per lineal foot

Building Communications Pathways

The horizontal communications cabling system infrastructure includes the pathway and support hardware which concentrates, supports and protects horizontal cable media between its origination point in the equipment room and the workstation outlet location. The riser pathway supports backbone cable distribution between stacked floors. The existing campus buildings were not designed with horizontal or riser cabling pathways. As a result cabling is distributed using wall mounted hooks, wiremold cable containment or otherwise surface mounted.

Riser pathways at buildings with multiple floors have been cored where possible. However, there are few instances where communications equipment rooms stack on one another that allow the cored riser pathway to be most beneficial. Horizontal pathways have been created with the use of j-hooks in accessible ceiling spaces or placed above ceiling tiles with no containment method. This type of installation does not provide for cable protection and does not allow cable to be replaced efficiently. Cable replacement will cause significant disruption in these spaces.

As part of the master plan new and renovated buildings will include communications pathways that begin with a minimum of (2) 4" and (2) 2" conduits running from a campus pull box or maintenance hole to the building main communications equipment room. The installation of these conduits will coincide with the renovation of existing buildings or the construction of the new buildings. Cable pathways from building equipment rooms will consist of wire basket and conduits located in accessible ceiling space that allow for horizontal cable installations and service with minimal disruption. Communications equipment rooms shall be stacked and linked together with a minimum of (4) 4" riser conduits used for the distribution of backbone cabling.

Campus Backbone Cabling

The campus backbone cabling currently consists of optical fiber and multi-pair copper cabling used for the distribution of data network and telephone service. Additional low voltage cabling is installed for fire alarm and other building management systems.

Optical Fiber Cabling

The College has an installation of air blown optical fiber pathways running throughout the campus infrastructure. The fiber pathway originates in the existing Library building and extends to each building on campus. The air blown fiber system is a series of tubes connected to allow for the installation of optical fiber. The existing optical fiber installed consists of multimode 62.5 micron cabling. Fiber strands are terminated in wall mounted or rack mounted termination panels at each building. As part of the master plan it is recommended that the College continue to use air blown fiber products for distribution of optical fiber throughout the campus. However, the campus main distribution point of optical fiber will originate from the new LRC building. An additional change to the current air blown fiber installation is an upgrade in fiber types. It is recommended that as the fiber installations be upgraded to a minimum of (12) strand of 50 micron multimode and (6) strands of single mode optical fiber to allow for increased bandwidths in the backbone. New buildings and existing renovated buildings shall have a minimum of 5 dedicated air blown fiber cells for distribution of cabling.

Copper Cabling

The backbone copper cabling installed across the campus is now in limited use as the majority of telephone signals are distributed over backbone fiber cabling using the new VoIP system. The copper cabling is still used to connect outside phone lines to fax modems and direct line phones.
As part of the master plan the multi-pair copper cabling will be reduced where possible. New buildings will have a small amount of copper pair cabling installed, i.e. 25 pair backbone cable. Where possible existing campus buildings that currently have large quantities of multi-pair copper cabling shall be reduced as part of the master plan effort. These reductions of unused copper cabling will increase the capacity of existing sections of campus backbone infrastructure duct banks.

See table 13 for revised cable types and quantities to be installed as part of the master plan upgrades.

Key Aims and Assumptions for the Development of the Master Plan Communications Infrastructure

The following key points underscore the proposed development of the IT Infrastructure on Campus.

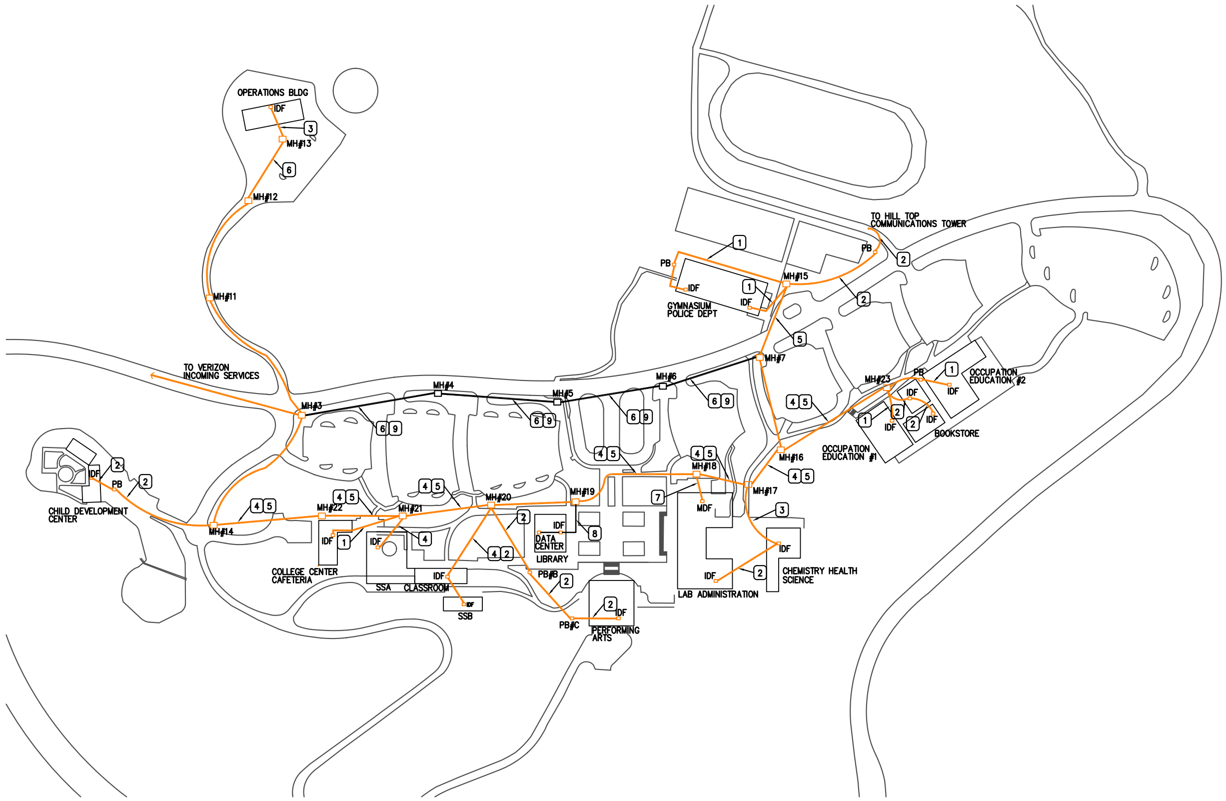
- The plan identifies a backbone infrastructure route that serves, but is separate from, the current buildings and the sites of future buildings as identified in the master plan. This approach will facilitate the renovation and construction of campus buildings in any sequence without interruption to voice and data network services.
- The infrastructure will designed for construction in a minimal amount of stages to minimize cost. The infrastructure plan will ensure that the component constructed at each stage forms a viable part of the final campus wide infrastructure.
- The infrastructure will reflect the increasing operational dependence on the network and aim to provide physical and logical network redundancy.
- Existing infrastructure that is in good condition and with a long lifespan will be retained and incorporated into the long-term plan in order to reduce costs.
- The Data Center will continue to occupy the current space in the Library/LRC in the near future. However, planning for the IT infrastructure will emphasize the move of data network equipment to a new data center location leaving the existing data center as a location for redundant core equipment.

Table 13 - Campus Communications Cabling

		Single Mode*		Multimode*		Fiber Cells***	
BLDG. NO.	BUILDING NAME	Pair Quantity	Linear Feet	Pair Quantity	Linear Feet	Cell Quantity	Linear Feet
1	LABORATORY CENTER (former Laboratory/Administration Bldg.)	6	1,000	12	1,000		
2	STUDENT CENTER (former Library)	6	1,450	12	1,450		
3	BOOKSTORE (former College Center)	6	1,000	12	1,000		
4	STUDENT SERVICES A	6	950	12	950		
5	STUDENT SERVICES C (former Classroom Building)	6	800	12	800		
6	OCCUPATIONAL EDUCATION 1	6	1,850	12	1,850		
7	EMERGENCY SERVICES (OE2 replacement building)	6	1,900	12	1,900		
8	PERFORMING ARTS CENTER	6	950	12	950		
9	MAINTENANCE & OPERATIONS	6	2,250	12	2,250	5	750
10	GYMNASIUM	6	2,350	12	2,350		
11	WELLNESS CENTER	6	2,000	12	2,000	5	600
12	CHEMISTRY	6	1,450	12	1,450	5	600
13	CHILD DEVELOPMENT CENTER 1						
14	CHILD DEVELOPMENT CENTER 2						
15	CHILD DEVELOPMENT CENTER EXPANSION	6	1,250	12	1,250	3	750
16	STUDENT SERVICES B	6	900	12	900		
19	ADMINISTRATION/ STUDENT SERVICES	6	300	12	300	5	300
20	LEARNING RESOURCE CENTER	6	–	12	–	100	500
21	HUMANITIES 1	6	500	12	500	5	500
22	HUMANITIES 2	6	500	12	500	5	500
23	PERFORMING ARTS CENTER EXPANSION	6	1,000	12	1,000	5	1,000
24	SCIENCES	6	1,000	12	1,000	5	1,000
25	COMMUNITY RECREATIONAL FACILITY	6	2,300	12	2,300	5	1,000
26	COMMUNITY CENTER	6	2,700	12	2,700	5	1,550
	TOTALS	6	28,400	12	28,400	153	9,050

* Optical fiber installations are based on the use of fiber strands inair blown fiber cells.
** Air blown fiber cells will be used to distribute campus backbone optical fiber cabling.

TECHNOLOGY | EXISTING



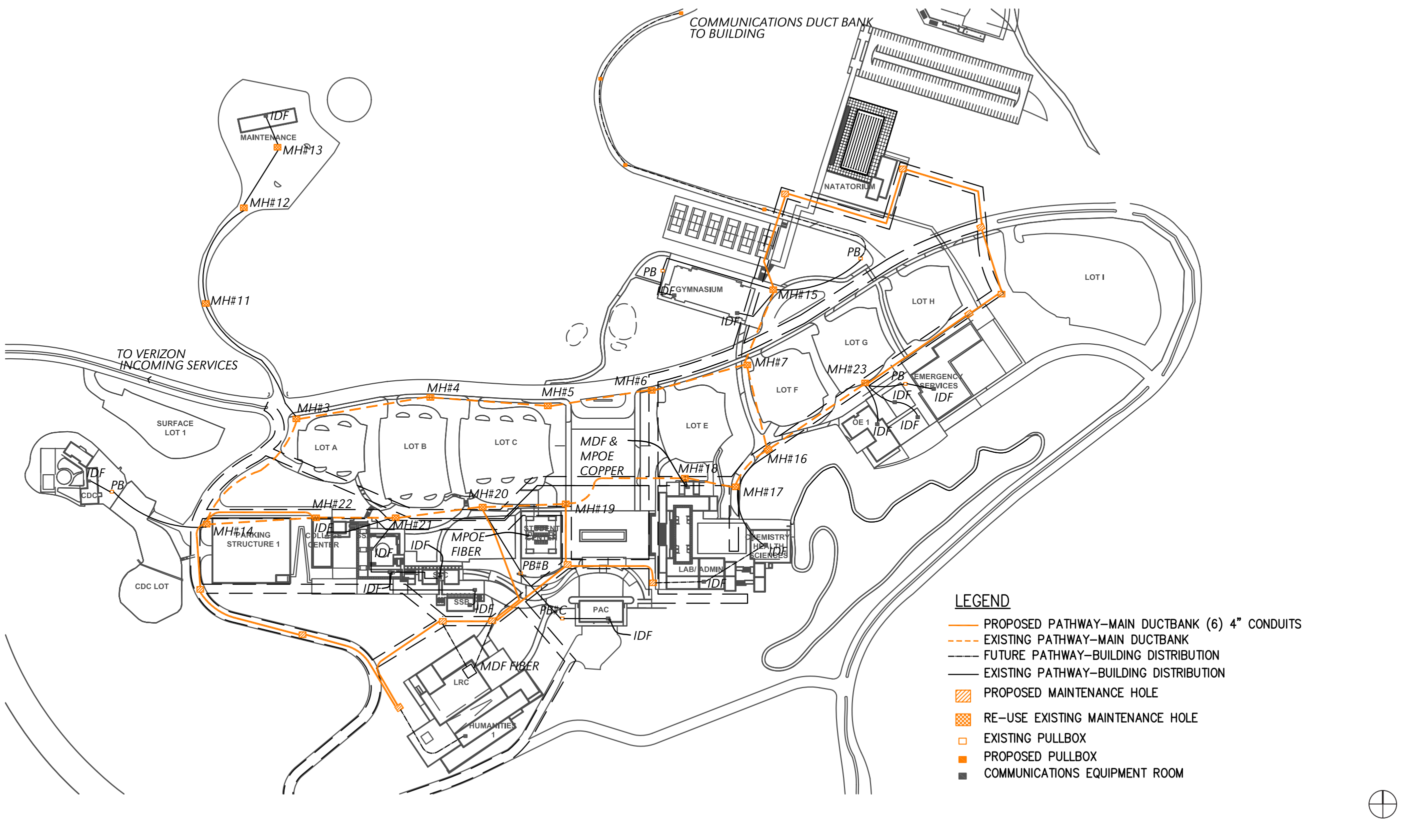
LEGEND

- EXISTING PATHWAY
- UNUSED PATHWAY
- MH MANHOLE
- PB PULLBOX

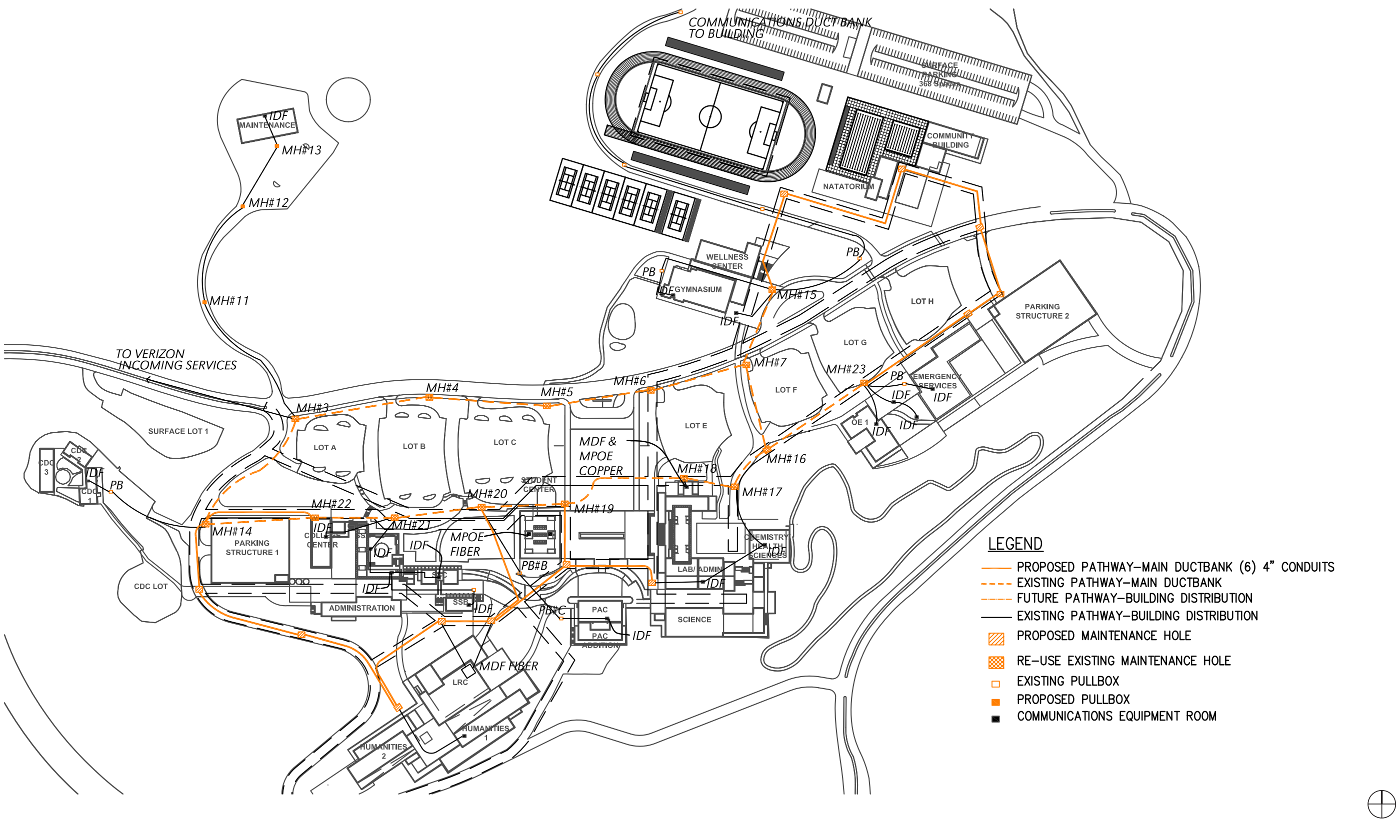
REFERENCE NOTES

1. (1) 2" CONDUIT
2. (2) 2" CONDUITS
3. (2) 3" CONDUITS
4. (2) 4" CONDUITS
5. (3) 3" CONDUITS
6. (4) 3" CONDUITS
7. (4) 4" CONDUITS
8. (8) 4" CONDUITS
9. PATHWAY IS UNUSED. SOME SECTIONS HAVE BEEN BLOCKED BY TREE ROOT GROWTH INTO CONDUIT.

TECHNOLOGY | 2012



TECHNOLOGY | 2025



6 ACKNOWLEDGEMENTS

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