

Miramar  
Community  
College  
Facilities  
Master Plan

**ARCHITECTURAL MASTER PLAN**

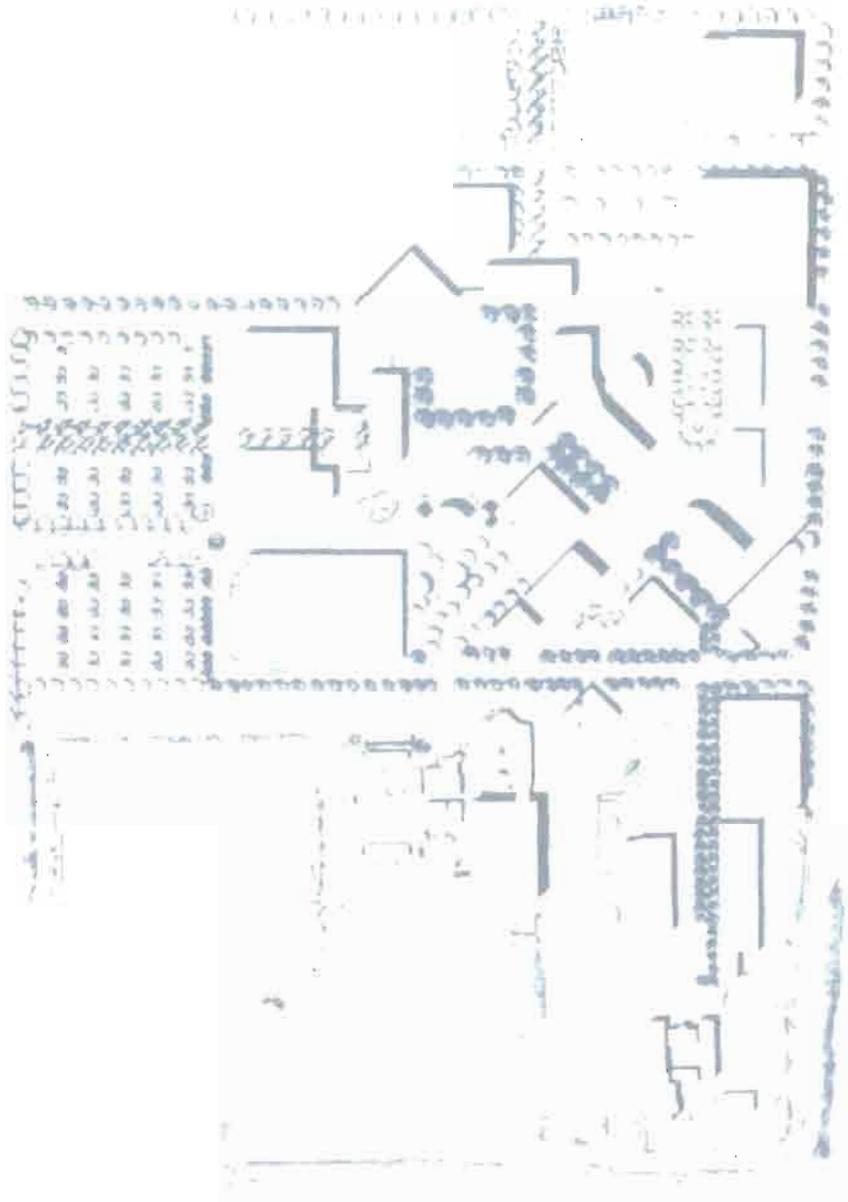
**LANDSCAPE MASTER PLAN**

**UTILITIES MASTER PLAN**

San Diego Community College District

June 2005  
Updated October 2005

P E R K I N S  
+ W I L L

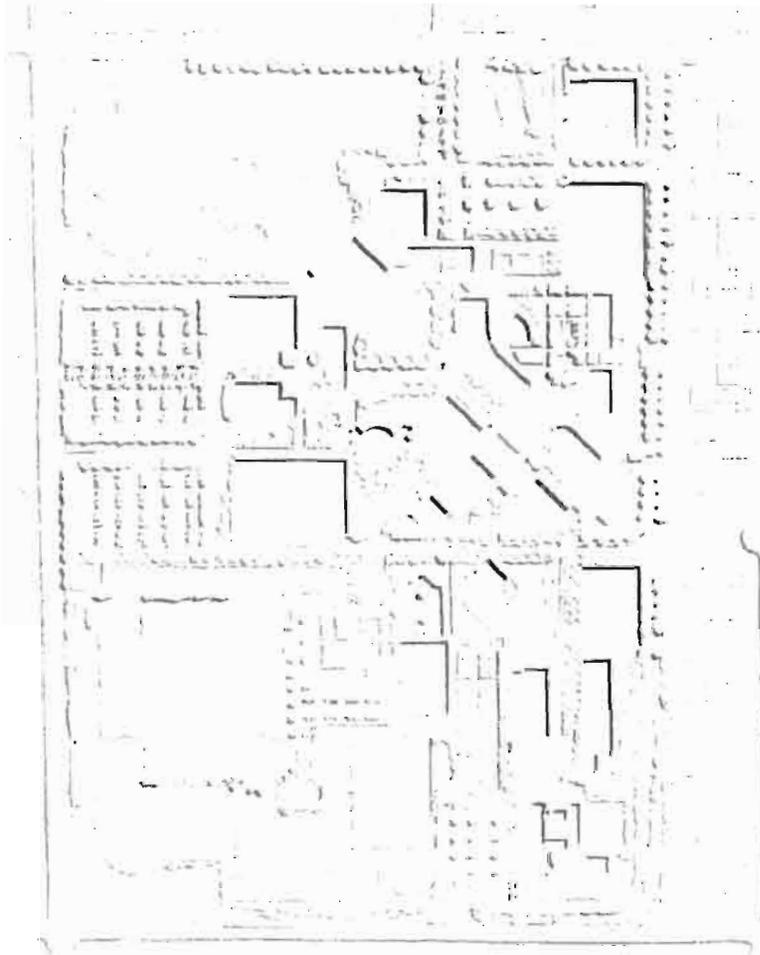


Miramar  
Community  
College  
Facilities  
Master Plan

ARCHITECTURAL MASTER PLAN

San Diego Community College District  
June 2005

PERKINS  
+ WILL



San Diego Community College Central - Visual Design Master Plan

**Table of Contents:**

Acknowledgements ..... 2

Mission Statement and Executive Summary ..... 3

**Design Analysis**

    Conceptual Plans and Case Study Analysis ..... 5

    Campus History ..... 6

    Site Analysis and Surrounding Context ..... 8

    Planning Strategies ..... 10

**Campus Master Plan**

    Existing Campus Plan ..... 15

    Phasing Sequence - Phase One ..... 16

    Phase One diagram ..... 17

    Phasing Sequence - Phase Two ..... 18

    Phase Two diagram ..... 19

    Phasing Sequence - Phase Three ..... 20

    Phase Three diagram ..... 21

    Final Phase - Pedestrian Pathways ..... 22

    Final Phase - Service Areas & Roads ..... 23

    Final Phase - Vehicular Egress ..... 24

    Final Phase - Parking ..... 25

    Outdoor Spaces ..... 27

    Signage and Way Finding ..... 29

**Architectural Vision**

    Architectural Images and Dialogue ..... 30

    Sustainable Design ..... 36

        Sustainable Sites - Site Analysis ..... 37

        Water Efficiency and Sustainability ..... 39

        Energy, Atmosphere and Building Orientation ..... 40

        Materials & Resources ..... 41

        Indoor Environmental Quality/Indoor Air Quality ..... 42

Bibliography ..... 43

## Acknowledgments

The Miramar College Master Plan is the result of over eight months of collaborative planning and research on behalf of the Miramar Master Plan Committee, the San Diego Community College District, the surrounding community, and the Perkins+Will Planning Team. From the onset, all members of the campus including students, staff and faculty, were encouraged to participate in campus planning meetings which structured this plan. The participation, time and consideration of all Committee and District members were invaluable to the planning process, and all must be congratulated for the selfless commitment each member has made to ensure the future development and success of the campus at Miramar.

### *Miramar Master Plan Committee:*

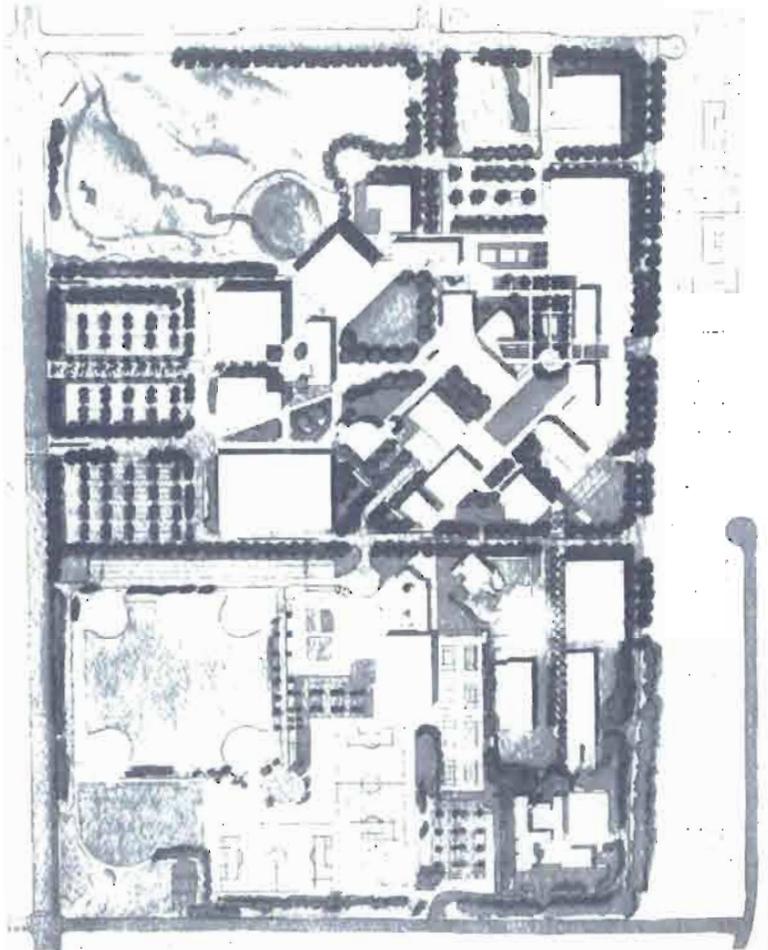
*Hanz Biltz, Associated Student President*  
*Rick Covert, Facilities Supervisor Landscape*  
*Pam Deegan, Vice President, Instruction*  
*Bob Fritsch, Fine Arts, Academic Senate President-Elect*  
*Robert Garber, Vice President Student Services*  
*Dan Gulowski, Hourglass Park Coordinator*  
*Pai Keir, former Miramar College President*  
*Peggy Manges, Director of Administrative Services*  
*Ron Manzoni, Interim President*  
*Mary Meiners, Psychology, former Academic Senate President*  
*George Mendivil, Associate Dean, North City Center Continuing Education*  
*Greg Newhouse, Associate Dean, Advanced Transcription Technology*  
*Wheeler North, Aviation, Academic Senate President*  
*Kevin Pelti, Biological Sciences*  
*Edith Pollack, Assistant Vice President Student Services*  
*Tim Riley, Regional Facilities officer*  
*Sandi Rosalia, Classified Senate Representative*  
*Jeff Stevens, Mira Mesa Community Representative*  
*Sarah Trevisan, Public Information Officer*  
*Jim Vincent, Dean, Continuing Education*

### *San Diego Community College District Office:*

*Damon Schamu, Assistant Chancellor, Facilities Management, San Diego Community College District*  
*Richard Burkhart, Facilities Management, San Diego Community College District*  
*Bryan Adams, District Architect*

### *Planning Team:*

*Nike Fejes, AIA, Managing Director  
Perkins+Will*  
*Nick Seierup, AIA, Design Director  
Perkins+Will*  
*Kyoko Adachi, Project Manager  
Perkins+Will*



San Diego Community College District, Miramar College Master Plan

## Mission Statement

"Our mission is to prepare students to succeed in a world of dynamic change by providing an environment which values excellence in teaching, learning, innovation and partnerships in a setting that celebrates diversity."

## Executive Summary

The Miramar College Master Plan represents a collaboration between the Miramar College Master Planning Committee, the District and the architects to establish a simple, yet thoughtful approach to campus planning and architecture. We have endeavored to consider design opportunities that may be derived from the existing context, historic influences, architectural case studies, planning strategies, programmatic need and site context, in order to provide future architects and campus administrators with a meaningful foundation for their own research. The plan attempts to address paradoxical contradictions between traditional construction and modernity. It offers both flexibility and structure by providing a "big idea" within which to work, creating opportunities for future changes in technology, programming and design standards.

The Master Planning Committee met seven times in eight months, beginning in April of 2004 with its first visioning session. At this session, planning guidelines were discussed and a review process was established to expedite the planning process. The Committee then set out to examine the overall site including its orientation, access and existing facilities, and began to formulate a forward thinking approach to campus growth. Finally, the visioning session began to define a planning process generated from investigations of axial and contextual relationships and adjacencies, in an effort to define a "big picture" or "main idea."

During these visioning sessions, the committee enumerated Proposition "S" funded projects, as well as future building requirements, and outlined construction phasing sequencing. It also proposed way finding and sustainability guidelines to support its future campus vision. Finally, outdoor spaces were hierarchically developed from the campus organizational structure that would protect existing endangered species, as well as provide central gathering spaces, reflective study zones, and processional spaces. These outdoor spaces will help to define the character of the campus' physical environment and provide opportunities for individual and industry recognition.

The Campus Plan lays out three dynamic axial relationships; one to the north on axis with Westview Parkway and in relation to Black Mountain in the distance, the second to the southeast, adjoining the upper and lower campuses, and finally to the west, uniting Black Mountain Road with the campus interior. A series of landscaped outdoor spaces and pedestrian pathways emanate from these axes, and all prominent buildings, both existing and proposed, relate to them.

With an abundance of available land, the campus planner and architect are afforded a tremendous opportunity for land development. Vernal and road pools located at the northwest corner of campus, currently in disrepair, would greatly benefit from restoration and protection. These pools periodically collect storm water, providing temporary habitat for endangered fairy shrimp and plant life. Preserving these pools would provide the campus with an opportunity to teach good environmental stewardship to the community.



3-D view of Final Miramar College Master Plan

On November 8, 2004, the Miramar College Master Plan was presented to a Citizen's Overview Committee for review and comment and on November 11th, the Board of Supervisors granted preliminary plan approval. It is the hope of the Master Planning Committee, the District and the Planning Team to provide future designers with a framework that will guide an environment supportive of the academic community it serves.

### Architectural Vision Statement

The new masterplan for Miramar College establishes an organizational framework for a future environment which is warm, open and humanly scaled, a vibrant world of higher education which strengthens the mission of elevated thought, preparation for workplace, and lifelong success. The planning, architecture, and landscape design all reflect and respond to the unique qualities of the campus' ecology, regional history, Mediterranean climate and community as modern translations of these contributing elements. Sustainable design strategies employed throughout demonstrate an educated commitment to the responsible use of the earth's resources.

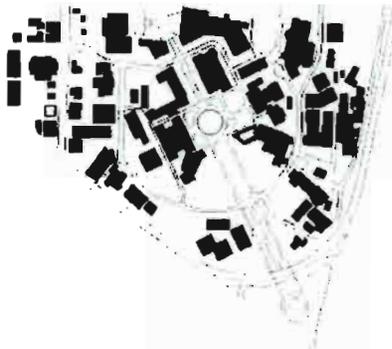
Through its perimeter landscaping and carefully sited buildings the campus presents a strong, coherent and clearly identifiable image to the surrounding world, a beacon of knowledge that welcomes and embraces the surrounding community as good neighbors and creates opportunities for shared use and accessible public interaction.

A special Miramar sense of place is created through an interconnected series of well-defined outdoor spaces which include large, formal quads, flexible programmatic areas, quiet, contemplative courtyards and gardens. Trellises, canopies, arcades and pergolas are employed as sun filters and space defining elements, and the careful use of water features acts to cool and humidify the air. The thematic use of bold color in plantings and landscape materials is contrasted against the architecture, which integrates with the landscape, and mutually reinforces the spaces defined between buildings and the learning process ongoing within.

Buildings are highly functional and flexible, integrating modern technologies with the ability to adapt to a wide range of teaching/curricular options, and designed to allow for future expansion. A consistent, coherent vocabulary is achieved campus-wide, as pre-existing buildings are unified with new structures through the use of color, landscape, and hardscape, referencing the history of the local missions and a sustainable strategy to minimize heat gain. As a result, formerly unrelated older buildings and new structures alike are united visually into a coherent campus. New buildings are built of traditional, natural materials within this color palette, and employ transparency to encourage inquisitiveness and communicate internal logic.

The Master Plan diagrams provide building footprints only, based upon customary square footages required by most programs. Each program will generate its own needs and requirements, which will in turn, generate individual building footprints. At the onset of each new project, it is the intention that the master plan will help inform the design process, saving time for the designer, and ensuring respectful acknowledgement of the basic organizational principles outlined in the Master Plan.

Timelessness, comfort, integrity and honesty of expression all act to create a functional, beautiful, and an esthetically pleasing campus environment which instills students, faculty and community members with memories of their Miramar College experience to last a lifetime.



University of Washington, Seattle, Washington



Parc de la Villette, Paris, France



Foothill College, Los Altos, California



University of Virginia, Charlottesville, Virginia

## Conceptual Plans and Case Study Analysis

In planning the Miramar campus, several case studies were selected as compositional guides to convey basic organizational principles of campus planning. These case studies employed radial, axial, composite, clustered, and grid systems, and included the University of Washington at Seattle, Parc de le Vilette, Paris, France, Foothill College (a campus in northern California), and the University of Virginia.

The use of vistas and visual reference points at the University of Washington campus were of special interest to the Miramar Master Planning Committee, where sight lines lead to Mt. Rainier through allees of cherry trees. Way finding is simplified as the mountain serves as a prevailing reference point throughout the campus.

Foothill College campus is similar in size to that of Miramar's at its proposed build-out of 25,000 enrollment. It uses a clustered organizational system, linking building groups to each other through a hierarchical system of outdoor spaces. The overall campus plan is "organic" in nature, organized around highly defined interior spaces that expand across a terraced terrain, and dispersing more loosely at its edges.

Parc de la Villette by Bernard Tschumi is located in Paris, France and demonstrates a composite plan organization. Originally developed as an urban renewal project, it incorporates themed gardens that unify man-made artifacts or "foilies" with "natural" landscaping elements.

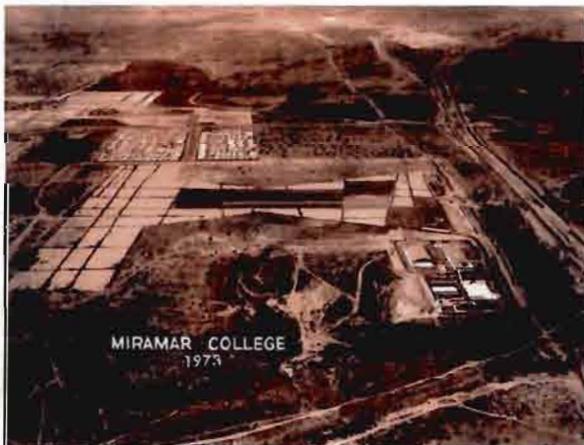
The University of Virginia is an historic campus designed by Thomas Jefferson in 1819 using a grid system. Jefferson originally designed the campus on a predictable building grid as a series of 10 pavilions connected by a colonnade. These pavilions were oriented around a central lawn terminated on one end by the Rotunda and open to mountain views at the other end. Each Pavilion was associated with the program taught within. Later, Old Cabell Hall was added to the end of the lawn, creating a campus quadrangle. This quad is now linked by an expansive tree-lined mall, framing views of buildings and adding a protective overhead shade canopy.

Using organizational information gained from these case studies, the Master Planning Committee set about to determine the best organizational strategy for the Miramar campus. The committee began by analyzing existing building structures and their relationships to parking, pedestrian access and way finding, as well as hierarchical programmatic relationships and programmatic interaction. In addition to previous site analysis, it also considered the campus' street visibility from several key intersections. Several schemes resulted from this analysis and included a clustered organizational scheme, a sight line organizational scheme centered on the Black Mountain vista, and an Hourglass scheme that employed the existing hourglass airfield as an historic artifact. The Hourglass was also used to determine landscape use and organization, and a roadway loop around the campus followed its pattern.

Finally, an axial scheme developed that linked the existing 45 degree angles generated from the Science and Technology Building classrooms with a grid generated from the Westview Drive/Black Mountain view court axis. This axial system revealed a strong pedestrian corridor leading from the southwest portion of campus to Westview Parkway through various outdoor spaces and building cavities.



Miramar College, 1958



Miramar College, 1973

San Diego Community College District, Miramar College Master Plan

## Campus History

### 1969-2003 Background:

The Miramar campus site is situated on Kearny Mesa, a mesa consisting of Tertiary and Quaternary-age rock supporting primarily coastal Diegan scrub and vernal pools. These pools are created during the rainy season by slow percolating soil conditions and support unique flora and fauna, as well as an endangered species of San Diego fairy shrimp (*branchinecta andiegonensis*).

From 1937 to 1958, the site was used as a private hourglass-shaped airfield disturbing much of the original plant and animal species. By 1969, the landing field had been plowed over to prevent its further use and the Miramar College campus opened with three buildings housing Administration of Justice and Fire Science programs. In 1971, Aviation Maintenance was added to the academic program.

Interstate 15 opened (formerly Highway 395), attracting development and by the late seventies and early eighties, residential housing had nearly surrounded the campus. The aerial image of 1996 shows the rapid growth of the Miramar area, as well as the absence of most of the historic airfield.

As the academic program evolved, the college added several more buildings to the site including: the Police Academy, the Interim Library, the Instructional Center, the Child Development Center, the Mira Mesa Recreational Complex (Hourglass Park), the District Computing Distribution Center, the Automotive Technology Career Instructional Building, the Science and Technology Building, the Diesel Technology Laboratory, and a host of portable/modular buildings serving as classrooms and administrative services.

On November 5, 2002, San Diego voters approved the Proposition "S" Construction Bond Program to renovate and modernize the existing campus structures, improve campus safety, and facilitate a master plan as a guideline for future construction and campus enhancements. The plan, in its final phase, will serve a future campus enrollment of 25,000 students.

Future curriculum development will include a diverse Liberal Arts program, and will enhance existing programs to meet the academic needs of a growing population. As the campus develops, strides should be taken to integrate new structures with thoughtful, well-developed landscaping and hardscaping to ensure a welcoming sense of place. The development of a layered hierarchy of outdoor gardens, plazas, private spaces and gathering spaces linked to building structures and parking by a system of pathways and visual corridors would greatly enhance campus socialization and desirability. An effort should also be made to acknowledge historic influences that have helped defined the campus to this point. These influences include references to aviation, geology, paleontology, and general San Diego history. The campus master planning committee must continue to assess and respond to campus needs as the campus enrollment grows and the academic program progresses.



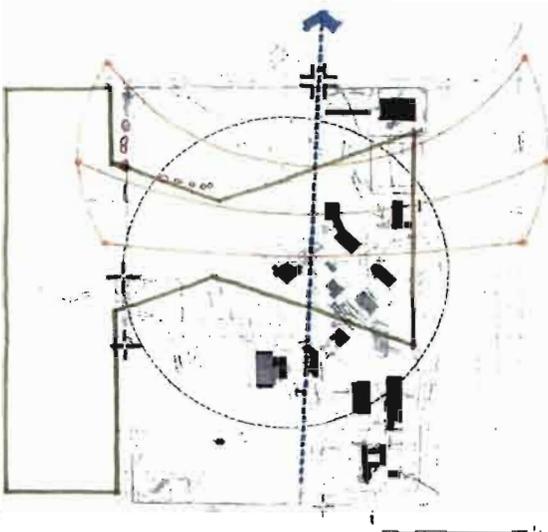
Miramar College, 1979



Miramar College, 1996



Proposed Final Master Plan - aerial view



Site analysis showing Hourglass airstrip (green), the sun's path as it travels across campus (orange), a ten-minute walk across campus (dashed purple circle shows the diameter of the 10 minute walk), and a visual axis with Black Mountain (blue dashed line). Vernal and road pools are indicated in red outline at the north-west edge of campus.



Looking north between existing Administration and Vernal Pools Avation Buildings

San Diego Community College District, Mission College Master Plan

## Site Analysis and Surrounding Context

Site analysis with respect to the Master Plan included context and climate analysis, transportation, zoning and community surveys. The Master Plan based its research on information provided by San Diego Regional Planning Agency (SANDAG), US Geological Survey (USGS), the US Library of Congress Historic American Buildings-Historic American Engineering Record, the San Diego Natural History Museum, a geologic survey conducted by Ninyo Moore, a Cultural Resource Survey provided by Potter & Associates, and an Environmental Impact Report provided by Helix Environmental Planning, Incorporated.

The Miramar campus is bordered by Black Mountain Road to the west, Hillery Drive to the north, East Campus Road to the east (at present not a continuous road), and Gold Coast Drive to the south. Westview Parkway runs perpendicular to the campus at Hillery Drive. The campus is also near the Interstate 15 to the east. Black Mountain Road has been identified by SANDAG as a prime #2 collector with high traffic volume. The junction between Hillery and Westview has been designated as a #3 collector, with significant traffic flow.

Zoning surrounding the campus varies and the campus is bordered by Wangenheim Middle School and Walker Elementary School to the west, as well as Walker Park. A newly completed shopping center and older trailer park lie to the north. Residential apartments lie to the east between the campus and the interstate, and to the south at Gold Coast Drive, as well as north east near East Campus Drive and Hillery Drive.

The campus is approximately 98.6 acres, with various tree species including mature eucalyptus to the southeast and mature evergreens bordering Hourglass Park and Black Mountain Road. In an Environmental Impact Report provided by Helix Environmental Planning, Inc., vegetation communities included wetland/riparian habitats (vernal and road pools), upland habitats, including Diegan coastal sage scrub and non-native grassland, and areas of disturbed habitat. Vernal Pool habitats included woolly marbles (*Psilocarphus brevissimus*), plantago (*Plantago elongate*), crassula (*Crassula aquatica*), chaffweed (*Centunculus minimus*), and adobe popcorn flower (*Plagiobothrys acanthocarpus*). Much of the indigenous plant and animal communities have been disturbed, however, the campus does support communities of rodents, coyote, and migratory birds. The southwestern portion is maintained as a joint-use recreation area with the City of San Diego and includes soccer and softball fields and an aquatic center.

In a Cultural Resource Survey provided by Potter and Associates, 2004, nearby prehistoric inhabitants included the San Dieguito Complex; people who enter the San Diego are from the desert approximately 9,000 years ago. More recent indigenous peoples include Northern Diegueno/Ipai, Southern/Diegueno/Ipai, and Luiseno peoples. The project falls within the Southern Diegueno/Ipai area. The study states that, "The record search from the SCIC and the San Diego Museum of Man did not identify any previous studies within the study area and both showed that no cultural resources had been previously identified."

A geologic evaluation of the area provided by Ninyo Moore concluded that the nearest known active fault line is the Rose Canyon Fault approximately 8 miles west of the campus site. In its conclusion, the survey found, "no active faults or landslides have been mapped, or were observed in the area." It also stated, however that, "the site has moderate potential for strong ground motions due to earthquakes on nearby active faults." Other geologic considerations include the presence of fill soils at the southern end of the site.

Most areas of the campus are well within a 10 minute walk, allowing for easy access from bus stops, parking lots and structures to classrooms. Most of the campus is relatively flat with the exception of an approximate 25 foot drop at the southeast corner where the Police Academy is presently located. At that location, the campus is served by an elevator tower in the Police Academy, as well as a steep flight of stairs.



Lower campus parking (left), Police Building (right), and stair well at grade change (in foreground).



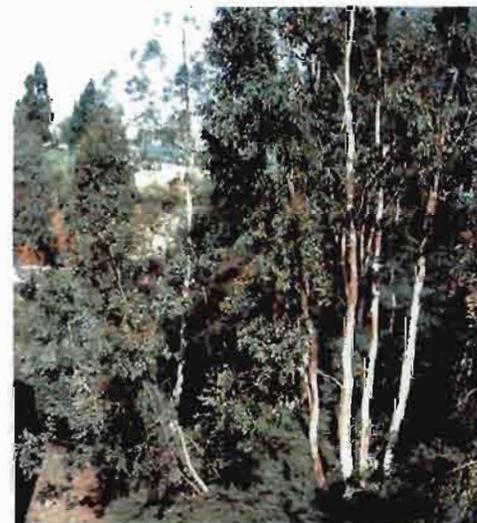
Walker Park is located across Black Mountain Road to the west of campus



Wangenheim Middle School to the west of Miramar campus



Park and ride at north west corner property bordered by Black Mountain Road and Hillery Drive



Eucalyptus trees and olive undergrowth at lower campus



Signage at corner of Black Mountain Road and Gold Coast Drive



Entry signage at Black Mountain Road



### Planning Strategies

The Miramar campus is currently challenged by inefficient organizational planning resulting from rapid and unplanned expansion. Pedestrian and vehicular way finding is hindered by the absence of clear, directed pathways and gathering spaces that would help define the campus experience and contribute to an enjoyable learning experience. The campus master planning process explored existing site opportunities such as view corridors, visual landmarks, pedestrian use patterns, programmatic relationships, parking requirements, and environmental concerns, to establish planning relationships that might lead to a unifying organizational system. Case studies provided successful planning models and four distinct plans emerged from this investigation. These plans were identified as the Black Mountain Axis Plan, the Hourglass Campus, the Clustered Plan and the Diagonal Axis Plan.

#### Black Mountain Axis Plan

A contextual investigation of the site revealed a visual axial connection with Black Mountain in the distance to the north of campus. As a response to this visual axis, an organizational strategy creating sight lines to Black Mountain along Westview Parkway was proposed, in much the same way as the University of Washington employed sight line references to Mt. Rainier. Using this strategy, most outdoor hierarchies and pathways would relate to this north/south axis.

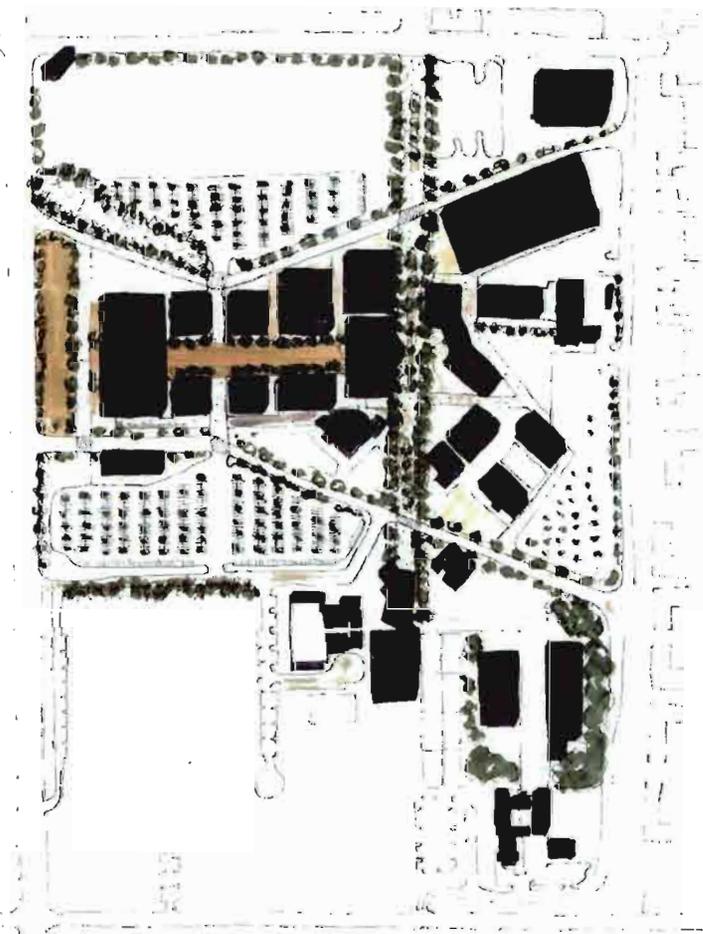
New building construction centered on this axis will create a central mall, similar to that employed at the University of Virginia. Subordinate outdoor spaces will emerge from the central space defined by pedestrian corridors and parking at the perimeter of campus.



Black Mountain axis  
View of Black Mountain to the north at intersection of Hilley and Westview Parkway



University of Washington, Seattle, Washington



### Hourglass Campus

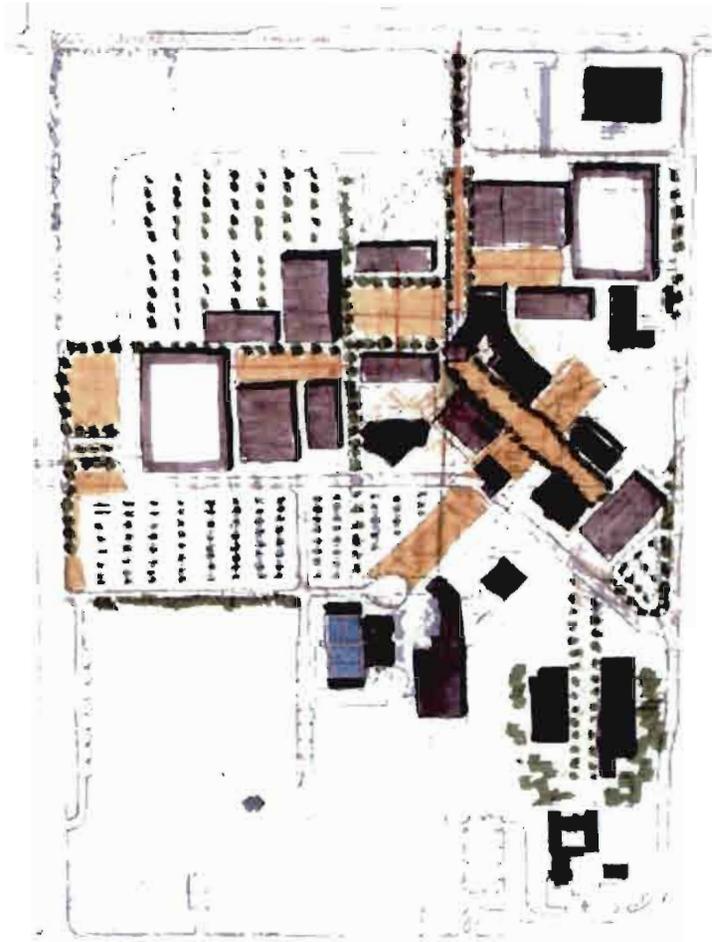
As mentioned in the campus history portion of this text, until 1958, the site was used as a private hourglass-shaped airfield. A circulation loop road was proposed using the remaining imprint of the airfield as a found artifact on the landscape. Site planning and campus development occurred as a response to this loop road, creating a central gathering space at the pinched portion of the hourglass and outlying parking surrounding it. This plan is similar to the composite plan at Parc de la Villette.



Historic Hourglass airstrip



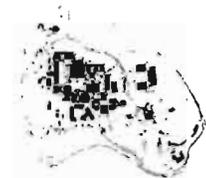
Parc de la Villette, Paris, France



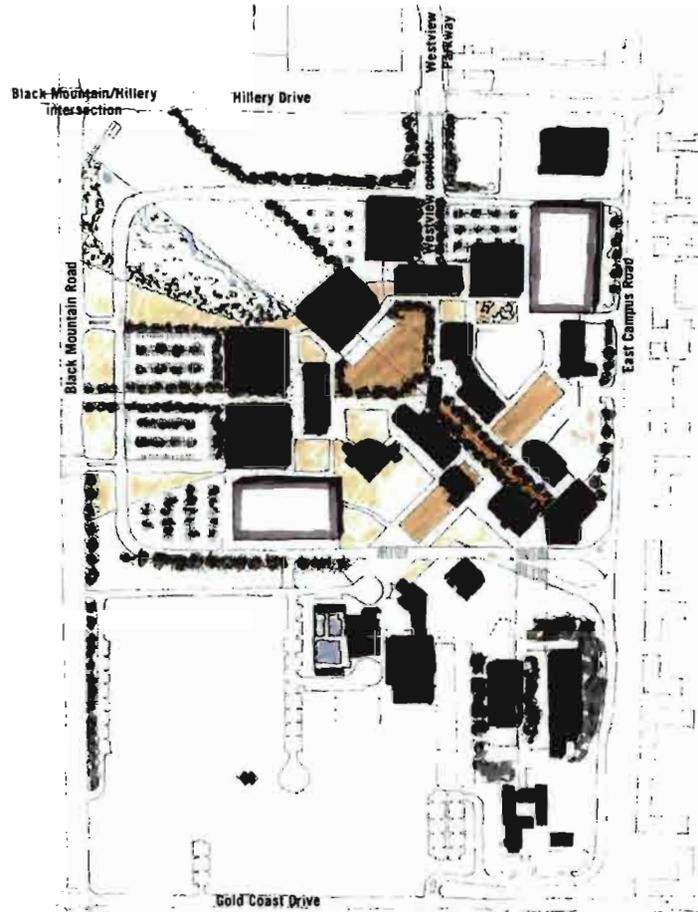
Santa Clara Community College, Dept. of Planning, Design, and Construction

### Clustered Plan

The clustered plan organized spaces hierarchically around nodes of activity and program, similar to the organization structure of Foothill College. Axial relationships with Black Mountain and existing 45 degree axes aligning with the Science and Technology Building provided the circulation structure for clusters. A large central outdoor space evolved, surrounded by smaller gathering spaces that were eventually flanked by parking.



Foothill College, Los Altos, California



### Diagonal Axis

A diagonal organizational scheme began to develop as a response to visual cues from external sight lines at two primary intersections of campus: Black Mountain/Hillery and Westview/Hillery. The Black Mountain/Hillery axis connected the busy intersection at Black Mountain and Hillery visually and structurally, providing opportunities for the development of an Environmental Preserve, transitional spaces and programs, and a primary central campus gathering space. The intersection of Westview/Hillery created the Westview corridor axis.

The 45 degree diagonal axis also afforded an opportunity to connect the new upper campus development with the older portion of campus by use of a connector pedestrian pathway. The existing campus population uses this pathway today, in a makeshift way, as pedestrians move from the lower southeastern portion of campus north to the newer portion of campus along the existing driveway connector road. This pedestrian movement is dangerous, as it mixes foot traffic with vehicular traffic. The diagonal axis scheme connects outdoor gathering spaces with a clear pedestrian pathway that minimizes vehicular/pedestrian interchange.



University of Virginia,  
Charlottesville, Virginia



### Final Master Plan

The final plan expanded the axial relationships that lay between pedestrian pathways and outdoor spatial hierarchies of the diagonal plan. The Environmental Preserve has evolved to become a principle identity opportunity, providing a "front door" that relates the campus to environmental protection and responsible land use.

Pedestrian and visual links to Westview Parkway to the north and Black Mountain Road to the west support the diagonal axial frame. View and pedestrian corridors are maintained through classroom building structures. The Tower is located at the center of campus, at the visual axis of Westview Parkway and Black Mountain Road, and acts as a visual compass point connecting pedestrian and view corridors. It is proposed that the Tower act as a central, high visibility signage point that will provide way finding and informational opportunities and link the campus visually to the surrounding community.

Parking is interspersed throughout campus along a vehicular loop road connecting Black Mountain Road with East Campus Road. Proposed campus development occurs around outdoor spaces creating shared outdoor "living rooms" that respond to the programmatic needs of adjacent buildings and other outdoor spaces.

Final Master Plan



**BUILDING KEY**

**PERMANENT STRUCTURES**

- 1. DISTRICT COMPUTING DISTRIBUTION CENTER  
ASF: 40,580 SF  
GSF: 34,600 SF
- 2. AUTOMOTIVE TECHNOLOGY CAREER INSTRUCTIONAL BUILDING  
ASF: 8,800 SF  
GSF: 10,880 SF
- 3. SCIENCE & TECHNOLOGY BUILDING  
ASF: 15,500 SF  
GSF: 45,225 SF
- 5. C-100 DIESEL TECHNOLOGY LAB
- 6. LIBRARY
- 7. U-100 HVAC PLANT
- 8. U-100 INSTRUCTIONAL CENTER
- 9. F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER
- 10. ADMINISTRATION
- 11. POLICE ACADEMY
- 12. CHILD DEVELOPMENT
- 13. AQUATIC CENTER
- 14. COMFORT STATION
- 15. UTILITIES

**TEMPORARY STRUCTURES**

- B1. OFFICES
- B2. B3. OFFICES/CLASSROOMS
- B4. CLASSROOMS/LAB
- C2. B OFFICE/1 CLASSROOM
- C3. ADMISSIONS & RECORDS CONSULTING, REPRODUCTION EQUIP. MAIL ROOM
- C5. SOCS MODULAR
- D1. DINING ROOMS, INDEPENDENT STUDY, LEARNING RESOURCES, STAFF RESTROOMS
- D2. CAFE/TERA, 3 CLASSROOMS, MEN'S ROOM
- D3. BOOKSTORE
- D4. CONTINUING EDUCATION CENTER
- F206. F204 CLASSROOMS
- G1. RESTROOMS
- P201. POOL GARDEN SHED
- P202. CAMPUS STORAGE
- S1. ASB BUILDING
- T1. FACULTY RESOURCE CENTER
- T2. OFFICES
- T3. OFFICES
- T4. CLASSROOMS

**PHASING LEGEND**

- EXISTING BUILDINGS TO REMAIN
- EXISTING PORTABLES
- EXISTING PORTABLES TO BE REMOVED
- NEW BUILDING AREAS PROPOSED AS PART OF PHASE 5
- VERNAL POOL
- ROAD POOL

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
EXISTING CAMPUS 2004

**Phasing Sequence**

<b>Phase One</b>		Bldg #	Funding Source	Prop-S Project #
Existing Campus Phasing plan up to and including LLRC & CET construction completion				
1.1	Relocate Science & Technology classrooms housed in portables into completed Science & Technology Building	3	PS	I-2
1.2	Relocate Science Labs from Administration Building to Science & Technology Building	10,3	PS	I-2
1.3	Construct "Leave a Legacy" Plaza			
1.4	Relocate Classrooms housed in F301-304 portables into Science & Technology Building	3	PS	I-2
1.5	Renovate space in Administration Building & relocate Faculty Offices in B-3, B-4 and C-2 into space vacated by science labs in Administration Building	10		
1.6	Create Public Information Office in Administration Building	10		
1.7a	Remove Bungalows B300, B400, C-200.		PS	IV-2
1.7b	Relocate Portables F301 - 304 to create Arts Village.			
1.8	Retrofit Utility Plant to create Cogeneration Plant	7	PS	II-5
1.9	Construct Health Education Science and Physical Conditioning Facility	17	PS	II-1
1.10	Develop City shared-use parking lot for Hourglass Park			
1.11	Relocate "Grinder." Prepare site for parking development			
1.12	Develop entry and parking at Black Mountain Road Re-grade entry Add Information Kiosk		PS	II-4
1.13	Develop Infrastructure and Landscape plans, plant perimeter and primary pathway shade trees. Add sidewalks and pedestrian egress where needed including entry at Black Mountain and at south-east campus road near Police Academy			
1.14	Construct LLRC	19	PS	I-1
1.15	Develop Eco-Garden & Campus Signage at northwest corner of Hillery Drive & Black Mountain Road			

**Phase One Continued**

<b>Phase One Continued</b>		Bldg #	Funding Source	Prop-S Project #
Existing Campus Phasing plan up to and including LLRC & CET construction completion				
1.16	Relocate Library associated programs throughout campus including "The Place" (currently located in D1 portable) into new LLRC including relocation of ILC into new LLRC	19	PS	I-1
1.17	Build Bus Terminal (by others). Construction scheduled for 2007		By Others	
1.18	Develop north entry & signage at intersection of Westview Parkway and Hillery Drive and provide linking road from Hillery Drive to parking lot south of District Computing/Distribution Center		PS	II-4
1.19	Develop Tower & Quad	20		
1.20	Build College Services Center & Police/Emergency Services substation. Re-route road to Aviation/Administration to create room for College Services Center/Police/Emergency Services	16	PS	II-2
1.21	Relocate Police Services from Portable B1 into new facility	16	PS	II-2
1.22	Renovate former Library Building and relocate Admissions, Counseling, Disabled Student Programs & Services, Extended Opportunity Programs & Services, Assessment Services & Evaluations into Student Services Center (former Library Building)	6	PS	IV-3
1.23	Remove Portables B1 & C3		PS	II-4
1.24	Relocate classrooms and offices housed in T100 - 404 into new LLRC. Remove portables T100 - 404	19	PS	I-1
1.25	Relocate Police Academy off-site and remodel existing building	11	PS	III
1.26	CET & ESL programs to move into remodeled former Police Academy building	11	PS	IV-5
1.27	Portable D4 to be removed			
1.28	Remodel Aviation Building	9	PS	IV-4

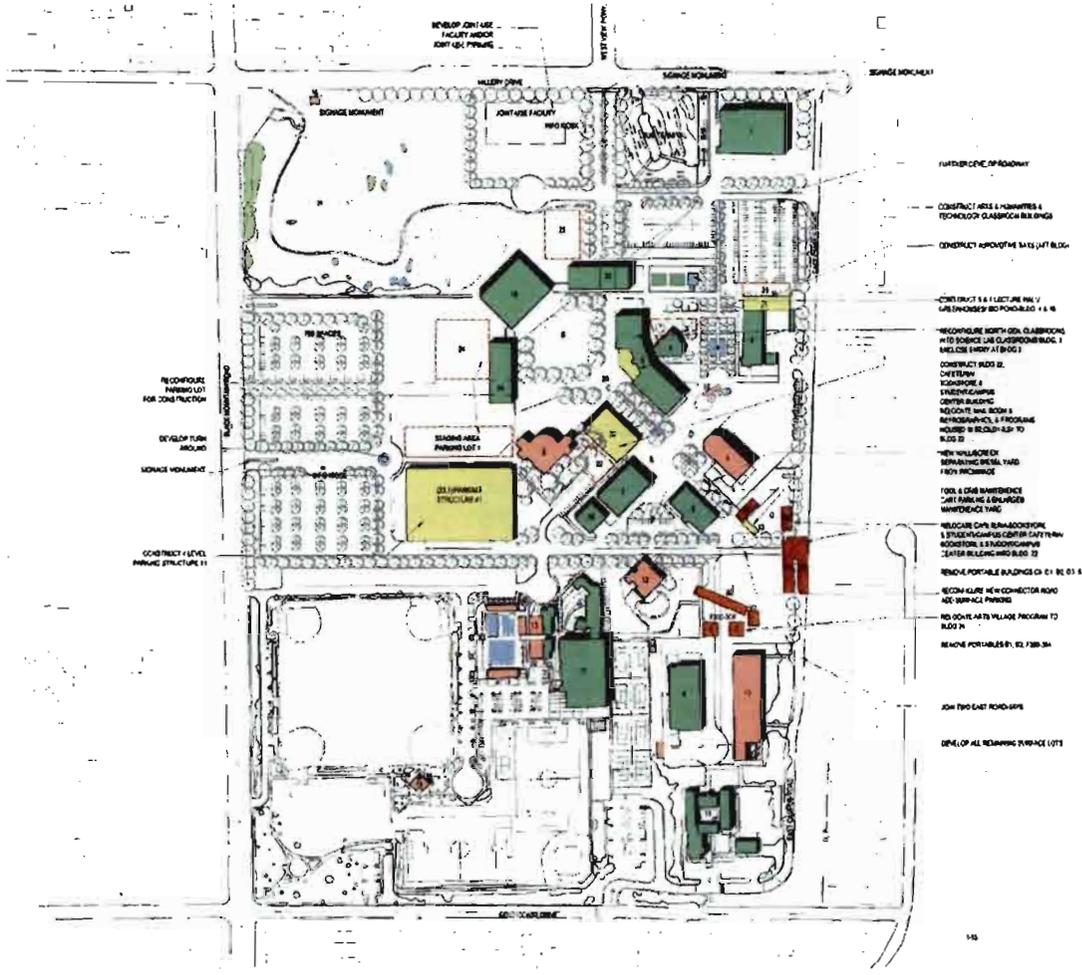
PS = Proposition "S" Funded Project



**Phasing Sequence**

<u>Phase Two</u>		<u>Bldg #</u>	<u>Funding Source</u>	<u>Prop-S Project #</u>
	Proposition "S" Build-out			
2.1	Construct Arts & Humanities Classroom Building	24	PS	I-5
2.2	Relocate programs from Arts Village (portables B2, F301 - 304) into new Arts & Humanities Classroom Building	24	PS	I-5
2.3	Construct new Cafeteria/Bookstore & Student/Campus Center Building	22		
2.4	Relocate Mail Room from lower campus and Reprographics (upper campus) to Student/Campus Center Building	22		
2.5	Relocate programs housed in B2, C5, D1, D2, D3, S1 into Student/Campus Center Building	22		
2.6	Remove portables C5, D1, D2, D3, S1		PS	II-4
2.7	Construct new Technology Classroom Building	25	PS	I-4
2.8	Develop connector road to East Campus Road		PS	II-4
2.9	Construct Parking Structure 1 and reconfigure city surface parking	23.1		
2.10	Develop connector road from Black Mountain Road to East Campus Road		PS	II-4
2.11	Develop all remaining surface parking areas			
2.12	Construct Science & Technology Lecture Hall/Greenhouses/Bio Pond. Reconfigure north general classrooms into lab classrooms and Bldg. 3 courtyard enclosure	3, 4, 18	PS	IV-1
2.13	Develop Joint Use Facility parking with Joint-use leased property (north campus)			
2.14	Enlarge Maintenance Services Yard and provide additional space at north east corner entrance of East Campus Road loop connector for tool crib & maintenance carl parking (electric vehicles). Screen from view	15		
2.15	Construct Potential expansion of ATT Building	21		

PS = Proposition "S" Funded Project



**BUILDING KEY**

- | PERMANENT STRUCTURES  |  | TEMPORARY STRUCTURES  |
|---|--|---|
| 1 DISTRICT COMPUTING DISTRIBUTION CENTER<br>ASF: 48,000 SF<br>OSF: 54,800 SF              | 16 COLLEGE SERVICES CENTER & POLICE/EMERGENCY SERVICES SUBSTATION<br>ASF: 15,000 SF<br>OSF: 20,200 SF            | B1, B2 ARTS/MUSIC CLASSROOMS<br>D7, D7, D1, S1 RELOCATE<br>F300-004 ARTS/MUSIC CLASSROOMS |
| 2 AUTOMOTIVE TEC-BIOLOGY CAREER INSTRUCTIONAL BUILDING<br>ASF: 8,800 SF<br>OSF: 18,800 SF | 17 HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE<br>ASF: 38,341 SF<br>OSF: 63,313 SF |   |
| 3 SCIENCE & TECHNOLOGY BUILDING<br>ASF: 33,300 SF<br>OSF: 45,225 SF                       | 18 GREENHOUSES & BIOLOGICAL POOL   |   |
| 4 SCIENCE & TECHNOLOGY LECTURE HALL   | 19 LIBRARY/LITC<br>ASF: 77,800 SF<br>OSF: 103,500 SF   |   |
| 5 C-180 DIESEL TECHNOLOGY LAB   | 20 TOWER   |   |
| 6 ADMISSIONS, COUNSELING, EVALUATIONS, DEOPS, DEOPS                                       | 21 AUTOMOTIVE BAYS<br>ASF: 4,930 SF<br>OSF: 6,930 SF   |   |
| 7 U-180 COGEN PLANT   | 22 CAFETERIA BOOKSTORE & STUDENT CAMPUS CENTER BUILDING<br>ASF: 45,000 SF<br>OSF: 80,750 SF                      |   |
| 8 S-180 INSTRUCTIONAL CENTER  | 23 PARKING STRUCTURE   |   |
| 9 F-180 AVIATION MAINTENANCE & TECHNOLOGY CENTER  | 24 ARTS & HUMANITIES CLASSROOM BUILDING<br>ASF: 30,000 SF<br>OSF: 48,500 SF                                      |   |
| 10 ADMINISTRATION & CLASSROOMS  | 25 TECHNOLOGY CLASSROOM BUILDING<br>ASF: 30,000 SF<br>OSF: 48,500 SF   |   |
| 11 CBT<br>ASF: 16,500 SF<br>OSF: 14,000 SF  |  |   |
| 12 CHILD DEVELOPMENT  |  |   |
| 13 AQUATIC CENTER   |  |   |
| 14 COURTPORT STATION  |  |   |
| 15 UTILITIES  |  |   |

**PHASING LEGEND**

- EXISTING BUILDINGS TO REMAIN
- EXISTING PORTABLES
- EXISTING PORTABLES TO BE REMOVED
- NEW BUILDING AREAS PROPOSED AS PART OF PROPOS
- FUTURE PROJECTS
- CONSTRUCTION STAGING
- VERNAL POOL
- ROAD POOL

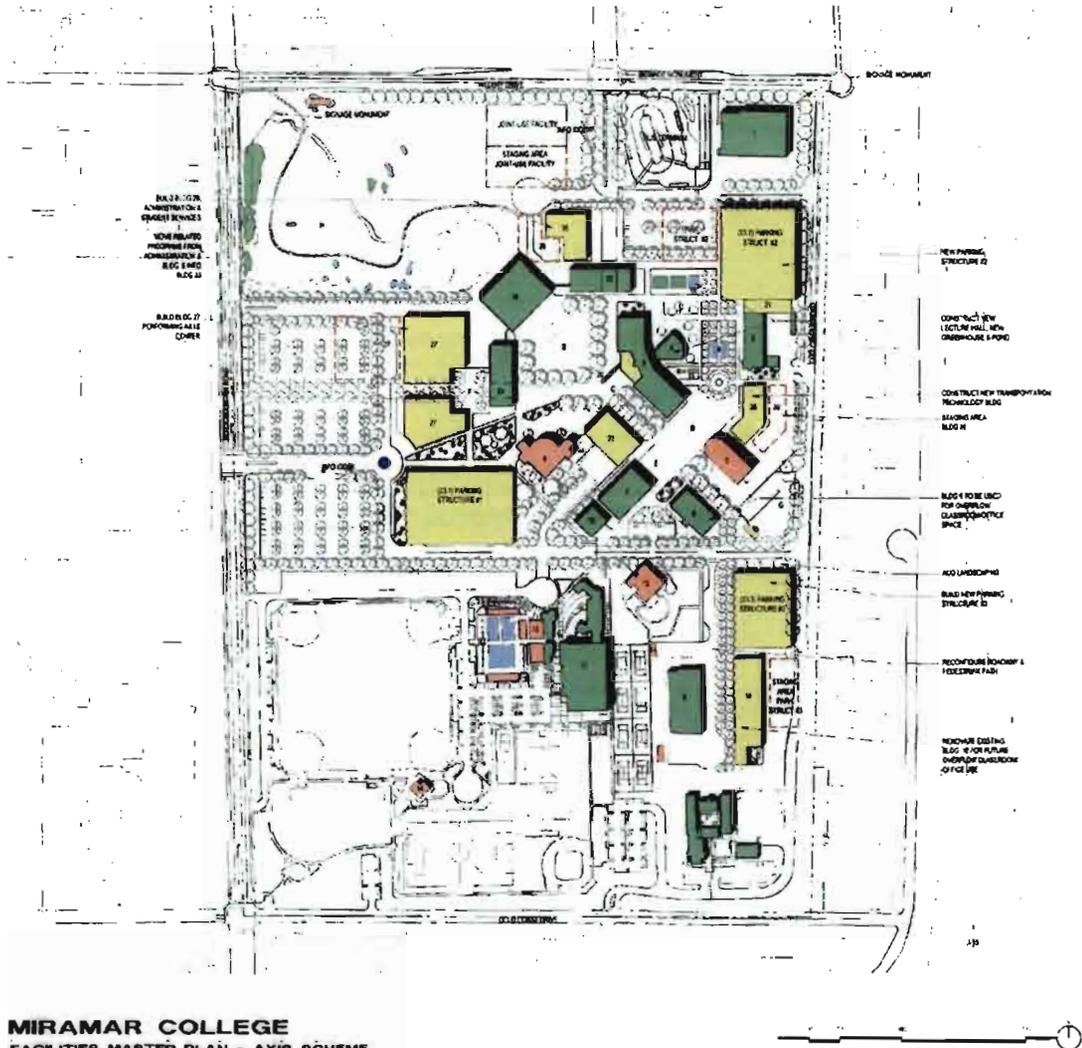
**OUTDOOR SPACE KEY**

- A LEARN-A-LEGACY PLAZA
- B CAMPUS QUADRANGLE
- C TOWER PLAZA
- D THE GREEK
- F STUDENT CENTER PLAZA
- G LANDSCAPE MAINTENANCE YARD
- H ENVIRONMENTAL PRESERVE

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
MILESTONE - PROP 8 BULDOZ  
PHASE TWO

**Phasing Sequence**

<u>Phase Three</u>		Bldg #	Funding Source	Prop-S #	Project #
Final Build-out @ 25,000 Enrollment					
3.1	Construct Administration/Admissions Building	26			
3.2	Relocate administrative & admissions, counseling, evaluations, DSPS and EOPS functions from former Administration Building & Building 6 (former Library Building) into new Administration Building	6,10,26			
3.3	Construct Parking Structure 2	23,2			
3.4	Renovate old Administration Building and use for overflow classroom/office space	10			
3.5	Construct Parking Structure 3	23,3			
3.6	Construct Performing Arts Complex	27			
3.7	Construct Transportation Technology Building for motorcycles & buses or Diesel Program and re-use existing Diesel Building for Motorcycle/Bus Technology program	28			
3.7	Finalize all landscape development				



**BUILDING KEY**  
PERMANENT STRUCTURES

- 1. DISTRICT COMPUTING DISTRIBUTION CENTER  
ASF: 40,000 SF  
GSF: 54,000 SF
- 2. AUTOMOTIVE TECHNOLOGY CAREER INSTRUCTIONAL BUILDING  
ASF: 8,000 SF  
GSF: 16,000 SF
- 3. SCIENCE & TECHNOLOGY BUILDING  
ASF: 33,300 SF  
GSF: 43,225 SF
- 4. SCIENCE & TECHNOLOGY LECTURE HALL
- 5. C-100 DIESEL TECHNOLOGY LAB
- 6. OVERFLOW CLASSROOM/OFFICES
- 7. U-100 COGEN PLANT
- 8. I-100 INSTRUCTIONAL CENTER
- 9. F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER
- 10. FACULTY OFFICES, CLASSROOMS
- 11. CET  
ASF: 10,200 SF  
GSF: 14,000 SF
- 12. CHILD DEVELOPMENT
- 13. AQUATIC CENTER
- 14. COMFORT STATION
- 15. LITUSES
- 16. COLLEGE SERVICES CENTER & POLICE/EMERGENCY SERVICES BUBBLA ON PROLIFE'S CAMPUS POLICE FACULTY'S INFORMATION COLLEGE SERVICES (2 OFFICES, 1 CLERICAL, STORAGE, CONF. ROOM, LOUNGE)  
ASF: 15,000 SF  
GSF: 20,250 SF
- 17. HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE 20,201 SF  
GSF: 42,373 SF
- 18. GREENHOUSES & BIOLOGICAL POND
- 19. LIBRARY/LRC  
ASF: 77,000 SF  
GSF: 116,000 SF
- 20. TOWER
- 21. AUTOMOTIVE BAYS  
ASF: 4,400 SF  
GSF: 8,800 SF
- 22. CAFETERIA/BOOKSTORE & STUDENT/CAMPUS CENTER BUILDING INCLUDING HEALTH FINANCIAL STUDENT AFFAIRS, HUMAN RESOURCE FACULTY CENTER, REPROGRAPHICS SUPPLY ROOM  
ASF: 45,000 SF  
GSF: 80,750 SF
- 23. 1-223 PARKING STRUCTURE
- 24. ARTS & HUMANITIES CLASSROOM BUILDING  
ASF: 20,000 SF  
GSF: 48,000 SF
- 25. TECHNOLOGY CLASSROOM BUILDING  
ASF: 20,000 SF  
GSF: 40,500 SF
- 26. ADMISSIONS, ADMINISTRATION & STUDENT SERVICES BUILDING  
ASF: 80,000 SF  
GSF: 11,000 SF
- 27. PERFORMING ARTS COMPLEX  
ASF: 80,000 SF  
GSF: 41,000 SF
- 28. TRANSPORTATION TECHNOLOGY BUILDING (MOTORCYCLES & BUSES)

**PHASING LEGEND**

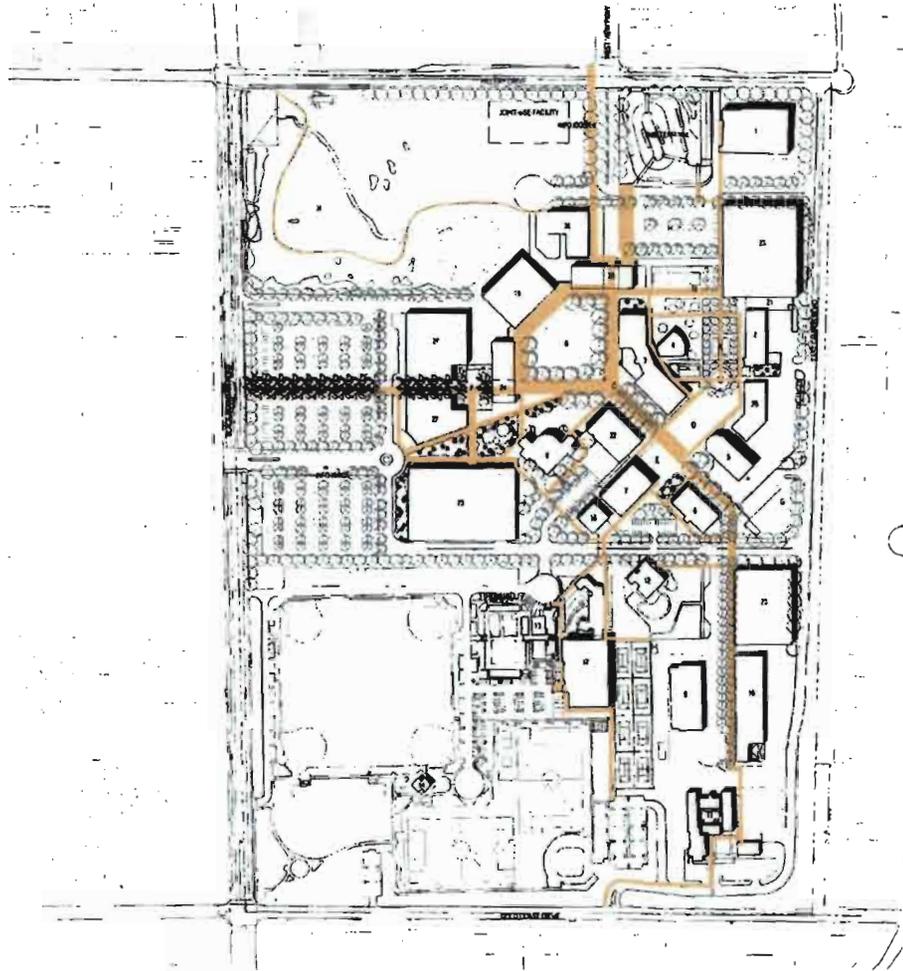
- EXISTING BUILDINGS TO REMAIN
- EXISTING PORTABLES
- EXISTING PORTABLES TO BE REMOVED
- NEW BUILDING AREAS PROPOSED AS PART OF PROPS
- FUTURE PROJECTS
- CONSTRUCTION STAGING
- VERNAL POOL
- ROAD POOL

**OUTDOOR SPACE KEY**

- A. LEAVE-A-LEGACY PLAZA
- B. CAMPUS QUADRANGLE
- C. HOMER PLAZA
- D. THE GREEN
- E. STUDENT CENTER PLAZA
- F. ARTS COURT
- G. LANDSCAPE MAINTENANCE YARD
- H. ENVIRONMENTAL PRESERVE

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
MILESTONE - CAMPUS BUILD-OUT 25,000 ENROLLMENT  
PHASE THREE

See Range Extension to College District, Miramar College Master Plan



**BUILDING KEY**  
PERMANENT STRUCTURES

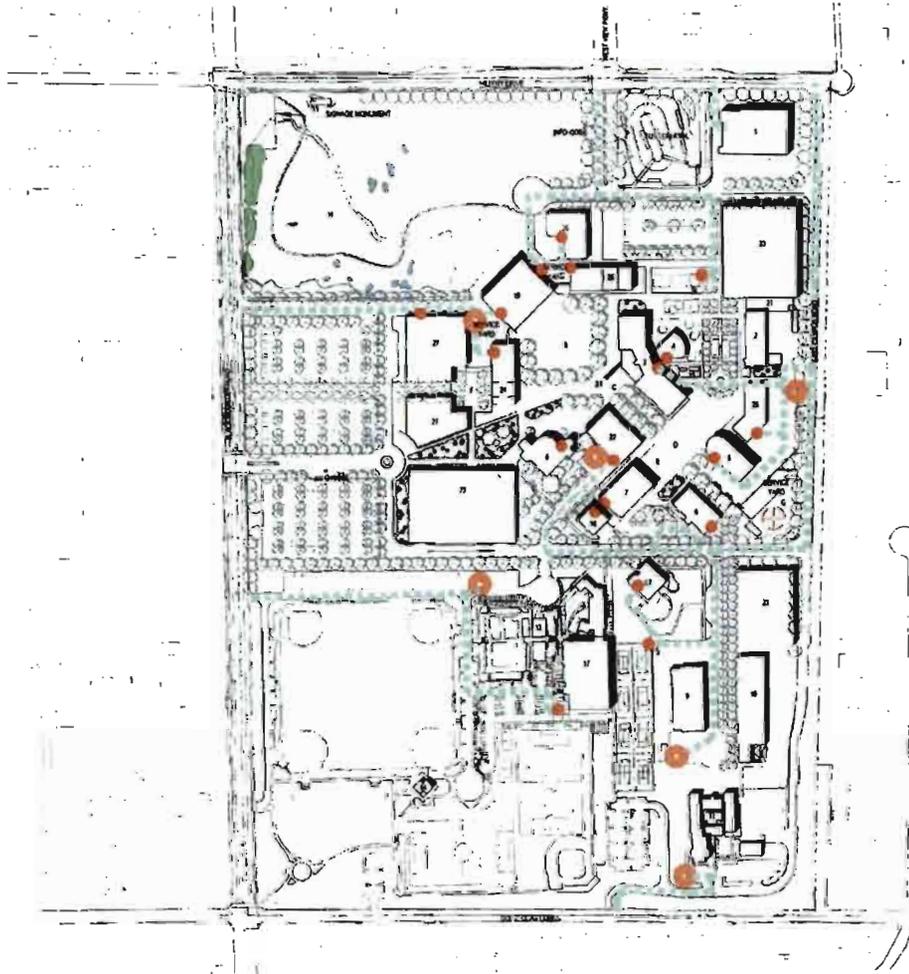
- |   |   |  |
|---|---|--|
| 1. DISTRICT COMPUTING/INSTRUCTION CENTER<br>ASF: 40,000 SF<br>GSF: 54,600 SF              | 16. COLLEGE SERVICES CENTER R & POLICE/EMERGENCY SERVICES SUBSTATION<br>INCLUDES CAMPUS POLICE FACILITIES, PROGRAMATION, COLLEGE SERVICES OFFICES, 1 OFFICIAL STORAGE, CONF. ROOM, LOUNGE<br>ASF: 11,000 SF<br>GSF: 30,250 SF | 24. ARTS & HUMANITIES CLASSROOM BUILDING<br>ASF: 50,000 SF<br>GSF: 60,500 SF                   |
| 2. AUTOMOTIVE TECHNOLOGY/CAREER INSTRUCTIONAL BUILDING<br>ASF: 8,000 SF<br>GSF: 10,800 SF | 17. HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE<br>ASF: 83,375 SF   | 25. TECHNOLOGY CLASSROOM BUILDING<br>ASF: 30,000 SF<br>GSF: 40,500 SF                          |
| 3. SCIENCE & TECHNOLOGY BUILDING<br>ASF: 33,900 SF<br>GSF: 43,225 SF                      | 18. GREENHOUSE & BIOLOGICAL POND  | 26. ADMISSIONS, ADMINISTRATION & STUDENT SERVICES BUILDING<br>ASF: 80,000 SF<br>GSF: 91,000 SF |
| 4. SCIENCE & TECHNOLOGY LECTURE HALL  | 19. LIBRARY/LRC<br>ASF: 77,000 SF<br>GSF: 103,950 SF  | 27. PERFORMING ARTS COMPLEX<br>ASF: 80,000 SF<br>GSF: 81,000 SF                                |
| 5. CIVIL/DESIGN TECHNOLOGY LAB  | 20. TOWER   | 28. TRANSPORTATION TECHNOLOGY BUILDING (MOTORCYCLES & BUSES)                                   |
| 6. CYBER/LOW CLASSROOMS/OFFICES   | 21. AUTOMOTIVE BAYS<br>ASF: 4,400 SF<br>GSF: 6,110 SF   |  |
| 7. 1/4-1/2 DOGSN PLAN*  | 22. CAFETERIA/BOOKSTORE & STUDENT/CAMPUS CENTER BUILDING INCLUDING HEALTH, FINANCE, STUDENT AFFAIRS, BANK ROOM, FACULTY CENTER, REPROGRAPHICS, SUPPLY ROOM<br>ASF: 45,000 SF<br>GSF: 60,750 SF                                |  |
| 8. >100 INSTRUCTIONAL CENTER  | 23. PAVING STRUCTURE  |  |
| 9. F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER   |   |  |
| 10. OFFICES & CLASSROOMS  |   |  |
| 11. CET<br>ASF: 10,500 SF<br>GSF: 14,000 SF   |   |  |
| 12. CHILD DEVELOPMENT   |   |  |
| 13. AQUATIC CENTER  |   |  |
| 14. COMFORT STATION   |   |  |
| 15. UTILITIES   |   |  |

**OUTDOOR SPACE KEY**

- A. "LEAVE-A-LEGACY" PLAZA
- B. CAMPUS QUADRANGLE
- C. TOWER PLAZA
- D. THE GREEN
- E. STUDENT CENTER PLAZA
- F. ARTS COURT
- G. LANDSCAPE MAINTENANCE YARD
- H. ENVIRONMENTAL PRESERVE

- PRIMARY PEDESTRIAN PATH OF TRAVEL
- SECONDARY PEDESTRIAN PATH OF TRAVEL
- MINOR PEDESTRIAN PATH OF TRAVEL
- NATURE TRAIL

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
PEDESTRIAN PATHWAYS



**BUILDING KEY**  
PERMANENT STRUCTURES

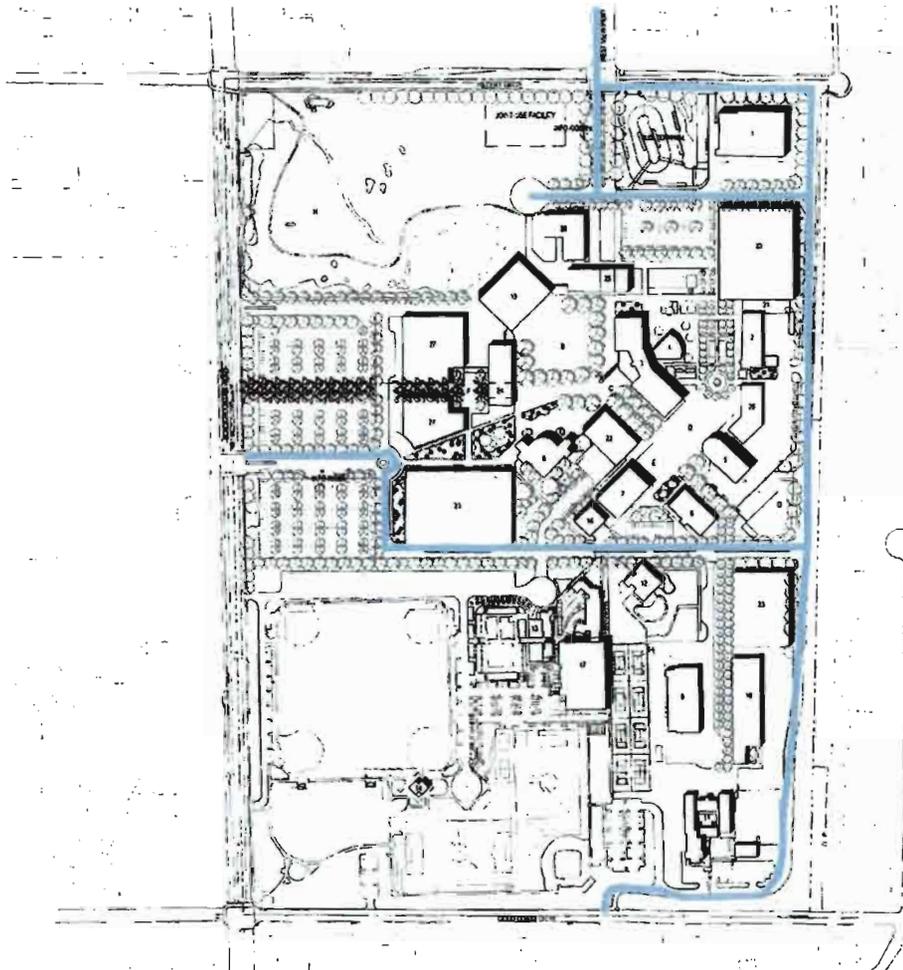
- |  |   |   |
|--|---|---|
| 1 DISTRICT COMPUTING DISTRIBUTION CENTER<br>ASF: 46,000 SF<br>GSF: 51,000 SF             | 16 COLLEGE SERVICES CENTER & POLICE/EMERGENCY SERVICES SUBSTATION INCLUDES CAMPUS POLICE FACILITIES, INFORMATION, COLLEGE SERVICES (2 OFFICES, 1 CLERICAL STORAGE, CONF ROOM, LOUNGE)<br>ASF: 15,000 SF<br>GSF: 29,200 SF | 24 ARTS & HUMANITIES CLASSROOM BUILDING<br>ASF: 30,000 SF<br>GSF: 48,500 SF   |
| 2 AUTOMOTIVE TECHNOLOGY CAREER INSTRUCTIONAL BUILDING<br>ASF: 8,000 SF<br>GSF: 19,800 SF | 17 HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE<br>ASF: 78,200 SF<br>GSF: 83,375 SF  | 25 TECHNOLOGY CLASSROOM BUILDING<br>ASF: 30,000 SF<br>GSF: 43,500 SF  |
| 3 SCIENCE & TECHNOLOGY BUILDING<br>ASF: 33,300 SF<br>GSF: 45,225 SF                      | 18 OVERFLOW GLASSROOMS/OFFICES<br>ASF: 10,320 SF<br>GSF: 14,000 SF  | 26 ADMINISTRATION, ADMINISTRATION & STUDENT SERVICES BUILDING<br>ASF: 60,200 SF<br>GSF: 81,800 SF   |
| 4 SCIENCE & TECHNOLOGY LECTURE HALL  | 7 U-100 COGEN PLANT   | 27 PERFORMING ARTS COMPLEX<br>ASF: 80,000 SF<br>GSF: 81,000 SF  |
| 5 C-100 DIESEL TECHNOLOGY LAB  | 8 F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER  | 28 TRANSPORTATION TECHNOLOGY BUILDING (MOTORCYCLES & BUSES)   |
| 6 OVERFLOW GLASSROOMS/OFFICES  | 9 F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER  | 20 TOWER  |
| 7 U-100 COGEN PLANT  | 10 OFFICES & CLASSROOMS   | 21 AUTOMOTIVE BAYS<br>ASF: 4,400 SF<br>GSF: 8,175 SF  |
| 8 F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER   | 11 CST<br>ASF: 10,320 SF<br>GSF: 14,000 SF  | 22 CAREER/BOOSTSTORE & STUDENT CAMPUS CENTER BUILDING INCLUDING HEALTH, FINANCE, STUDENT AFFAIRS, MAIL ROOM, FACULTY CENTER, REPROGRAPHICS, SUPPLY ROOM<br>ASF: 48,000 SF<br>GSF: 60,750 SF |
| 9 F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER   | 12 CHILD DEVELOPMENT  | 23 PARKING STRUCTURE  |
| 10 OFFICES & CLASSROOMS  | 13 AQUATIC CENTER   |   |
| 11 CST<br>ASF: 10,320 SF<br>GSF: 14,000 SF   | 14 COMFORT STATION<br>ASF: 18,000 SF<br>GSF: 20,750 SF  |   |
| 12 CHILD DEVELOPMENT   | 15 UTILITIES  |   |
| 13 AQUATIC CENTER  |   |   |
| 14 COMFORT STATION<br>ASF: 18,000 SF<br>GSF: 20,750 SF                                   |   |   |
| 15 UTILITIES   |   |   |
|  |   |   |

**OUTDOOR SPACE KEY**

- A "LEAVE A LEGACY" PLAZA
- B CAMPUS QUADRANGLE
- C TOWER PLAZA
- D THE GREEN
- E STUDENT CENTER PLAZA
- F ARTS COURT
- G LANDSCAPE MAINTENANCE YARD
- H ENVIRONMENTAL PRESERVE

- SERVICE ROAD
- SERVICE ENTRY
- CITY TRASH PICK UP POINT
- FUTURE RECYCLING CENTER & COMPOSTING AREA

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
SERVICE AREAS & ROAD



**BUILDING KEY**  
PERMANENT STRUCTURES

- |   |  |   |
|---|--|---|
| 1. DISTRICT COMPUTING DISTRIBUTION CENTER<br>ASF: 40,000 SF<br>GSF: 54,000 SF             | 14. COLLEGE SERVICES CENTER & POLICE/EMERGENCY SERVICES SUBSTATION INCLUDES CAMPUS POLICE FACILITIES, INFORMATION, COLLEGE SERVICES (2 OFFICES, 1 CLERICAL, STORAGE, CONF. ROOM, LOUNGE)<br>ASF: 14,000 SF<br>GSF: 20,250 SF | 24. ARTS & HUMANITIES CLASSROOM BUILDING<br>ASF: 30,000 SF<br>GSF: 40,000 SF                  |
| 2. AUTOMOTIVE TECHNOLOGY CAREER INSTRUCTIONAL BUILDING<br>ASF: 8,000 SF<br>GSF: 10,000 SF | 17. HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE: 30,301 SF<br>GSF: 43,373 SF   | 25. TECHNOLOGY CLASSROOM BUILDING<br>ASF: 30,000 SF<br>GSF: 40,000 SF                         |
| 3. SCIENCE & TECHNOLOGY BUILDING<br>ASF: 32,500 SF<br>GSF: 45,225 SF                      | 18. OPEN HOUSES & BIOLOGICAL POND  | 26. ADMISSIONS ADMINISTRATION & STUDENT SERVICES BUILDING<br>ASF: 60,000 SF<br>GSF: 81,000 SF |
| 4. SCIENCE & TECHNOLOGY LECTURE HALL  | 19. LIBRARY/ILRC<br>ASF: 77,000 SF<br>GSF: 102,000 SF  | 27. PERFORMING ARTS COMPLEX<br>ASF: 60,000 SF<br>GSF: 81,000 SF                               |
| 5. C-HR DIESEL TECHNOLOGY LAB   | 20. TOWER  | 28. TRANSPORTATION TECHNOLOGY BAY (TRNG, MOTORCYCLES & BUSES)                                 |
| 6. OVERFLOW CLASSROOMS/OFFICES  | 21. AUTOMOTIVE BAYS<br>ASF: 4,000 SF<br>GSF: 8,000 SF  |   |
| 7. U-100 COGEN PLANT  | 22. CAFETERIA/BOOKSTORE & STUDENT CENTER BUILDING INCLUDING HEALTH, FINANCE, STUDENT AFFAIRS, MAIL ROOM, FACULTY CENTER, REPROGRAPHICS, SUPPLY ROOM<br>ASF: 45,000 SF<br>GSF: 60,750 SF                                      |   |
| 8. I-100 INSTRUCTIONAL CENTER   | 23. PARKING STRUCTURE  |   |
| 9. F-100 AVIATION MAINTENANCE & TECHNOLOGY CENTER   |  |   |
| 10. OFFICES & CLASSROOMS  |  |   |
| 11. CBT<br>ASF: 18,500 SF<br>GSF: 14,000 SF   |  |   |
| 12. CHILD DEVELOPMENT   |  |   |
| 13. AQUATIC CENTER  |  |   |
| 14. COMFORT STATION   |  |   |
| 15. UTILITIES   |  |   |

**OUTDOOR SPACE KEY**

- A. LEAVE-A-LEGACY PLAZA
  - B. CAMPUS QUADRANGLE
  - C. TOWER PLAZA
  - D. THE GREEN
  - E. STUDENT CENTER PLAZA
  - F. ARTS COURT
  - G. LANDSCAPE MAINTENANCE YARD
  - H. ENVIRONMENTAL PRESERVE
- PRIMARY VEHICULAR EGRESS

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
PRIMARY VEHICULAR EGRESS



**BUILDING KEY**  
PERMANENT STRUCTURES

- |  |   |   |
|--|---|---|
| 1 DISTRICT COMPUTING DISTRIBUTION CENTER<br>ASF: 40,000 SF<br>GSF: 54,000 SF             | 16 COLLEGE SERVICES CENTER & POLICE/EMERGENCY SERVICES SUBSTATION INCLUDES CAMPUS POLICE FACILITIES, INFORMATION, COLLEGE SERVICES IT OFFICES, 1 CLERICAL STORAGE, CONF. ROOM, LOUNGE<br>ASF: 15,800 SF<br>GSF: 20,250 SF | 25 PARKING STRUCTURE  |
| 2 AUTOMOTIVE TECHNOLOGY CAREER/INSTRUCTIONAL BUILDING<br>ASF: 8,000 SF<br>GSF: 10,800 SF | 17 HEALTH EDUCATION SCIENCE & PHYSICAL CONDITIONING FACILITY FOR COLLEGE USE: 79,261 SF<br>GSF: 43,373 SF   | 26 ARTS & HUMANITIES CLASSROOM BUILDING<br>ASF: 20,628 SF<br>GSF: 48,960 SF                   |
| 3 SCIENCE & TECHNOLOGY BUILDING<br>ASF: 31,308 SF<br>GSF: 45,225 SF                      | 18 ONE-SHEDS & BIOLOGICAL POND  | 27 TECHNOLOGY CLASSROOM BUILDING<br>ASF: 32,000 SF<br>GSF: 46,000 SF                          |
| 4 SCIENCE & TECHNOLOGY LECTURE HALL  | 19 LIBRARY/LAC<br>ASF: 77,000 SF<br>GSF: 103,500 SF   | 28 ADMISSIONS, ADMINISTRATION & STUDENT SERVICES BUILDING<br>ASF: 40,000 SF<br>GSF: 81,000 SF |
| 5 CIVIL DESIGN TECHNOLOGY LAB  | 20 TOWER  | 29 TRANSPORTATION TECHNOLOGY BUILDING (MOTORCYCLES & BUSES)                                   |
| 6 OVERFLOW CLASSROOMS-OFFICES  | 21 AUTOMOTIVE BAYS<br>ASF: 4,482 SF<br>GSF: 6,912 SF  |   |
| 7 1-100 COGEN PLANT  | 22 CAMPUS BOOKSTORE & STUDENT CAMPUS CENTER BUILDING INCLUDING HEALTH, FINANCE, STUDENT AFFAIRS, MAIL ROOM, FACILITY CENTER, REPROGRAMMING SUPPLY ROOM<br>ASF: 45,028 SF<br>GSF: 61,750 SF                                |   |
| 8 1-100 INSTRUCTIONAL CENTER   |   |   |
| 9 1-100 INSTRUCTION MAINTENANCE & TECHNOLOGY CENTER                                      |   |   |
| 10 OFFICES & CLASSROOMS  |   |   |
| 11 CET<br>ASF: 16,528 SF<br>GSF: 14,022 SF   |   |   |
| 12 CHILD DEVELOPMENT   |   |   |
| 13 AQUATIC CENTER  |   |   |
| 14 COMFORT STATION   |   |   |
| 15 UTILITIES   |   |   |

**PARKING LEGEND**

- CAMPUS SURFACE PARKING
- HOUR/GLASS PARKING
- PARKING STRUCTURES

**OUTDOOR SPACE KEY**

- A 'NEAVE' AS SEAGY PLAZA
- B CAMPUS QUADRANGLE
- C TOWER PLAZA
- D THE GREEN
- E STUDENT CENTER PLAZA
- F ARTS COURT
- G LANDSCAPE MAINTENANCE YARD
- H ENVIRONMENTAL PRESERVE

**MIRAMAR COLLEGE**  
FACILITIES MASTER PLAN - AXIS SCHEME  
PARKING

**Existing Parking Count: (per Miramar College Parking Survey: 9/02)**

Campus Total:	1,546
Hourglass Park:	292
<b>Total:</b>	<b>1,838</b>

Current parking ratios at the college are 54 spaces per student.

**Projected Need at 25,000 Enrollment:**

Based on 25,000/54 parking ratio factor (4,482) + additional staff parking (450) = 4,932 spaces are required. City of San Diego municipal code allows a 15% reduction in minimum parking reducing the required number of spaces to 4,193

**Phase 1 Parking:**

Black Mountain Lots	736
Administration Lot	105
Distribution Center	80
Lot below Dist. Center	260
Existing Lot bordered by Black Mountain	755
Aviation/Admin Lot	77
C500	5
Academy Lots (43 + 28)	71
<b>Total</b>	<b>2,089</b>

**Phase 2 Parking:**

Northeast Parking Structure (4 Levels)	820
Black Mountain Lots	700
Administration Lot	105
Distribution Center	80
Lot below Dist. Center	260
Campus Center Lots (Library + Student Serv.+ Diesel Lot) (36+28+19)	83
Academy Lots (43 + 28)	71
<b>Total</b>	<b>2,119</b>

**Phase 3 Parking:**

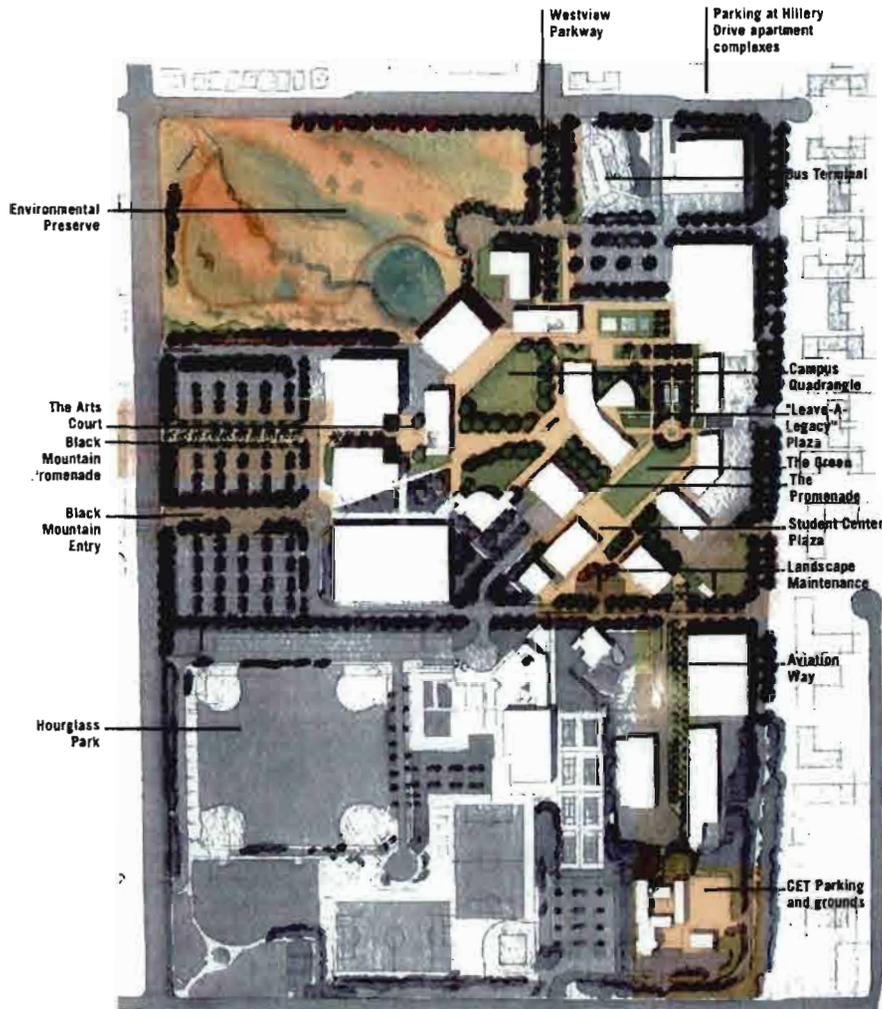
Southwest Parking Structure #1 (4 Levels)	1,000
Northeast Parking Structure #2 (4 Levels)	820
Southeast Parking Structure #3 (6 Levels)	750
Black Mountain Lots	700
Administration Lot	105
Distribution Center	80
Campus Center Lots (Library + Student Serv.+ Diesel Lot) (36+28+19)	83
Academy Lots (43 + 28)	71
<b>Total</b>	<b>3,609</b>

Required number of spaces	4,193
Less total number of spaces at end of Phase 3	3,609
<b>Shortfall:</b>	<b>(584)</b>

**Parking Options:**

to meet 584 shortfall spaces

1. Add West View Parking Structure (4 Level) 1,000 spaces  
or
2. Make Northeast & Southwest Structures 6 Levels (Add 2 levels to each Structure) 900 spaces  
or
3. Revise calculation to provide fewer stalls, encouraging more efficient and sustainable transportation alternatives such as use of public transportation, carpooling, and bicycle usage.

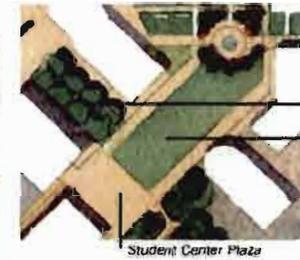
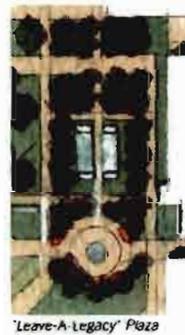


San Diego Community College District, Master College Master Plan

## Outdoor Spaces

Outdoor spaces are organized along three axial relationships, the Westview/Black Mountain view corridor, the diagonal axis connecting the center of campus with the intersection of Black Mountain Road and Hillery Drive. Adjacent to the Transit Authority Bus Terminal is the Westview Parkway/Hillery Drive entry to the north that provides the portal to the campus and accommodates both vehicular and pedestrian traffic. At the time of this writing, an HOV lane from the Interstate 15 along Hillery Drive is proposed from the east dedicated to bus lanes, to serve the bus terminal. A traffic study will be required for this intersection, to predict the actual traffic flow impact and signaling requirements for this area. Overflow parking for the Bus Terminal is proposed across Hillery Drive, adjacent to the shopping center to the north, behind the existing apartment buildings. Limited parking is also provided in front of the northern apartment complexes along Hillery Drive.

Principle outdoor areas include: the "Leave-A-Legacy" Plaza, near the Science and Technology Building, the Campus Quadrangle, the Tower Plaza, The Green, the Student Center Plaza, the Arts Court, and the Environmental Preserve. The Tower Plaza and the Campus Quadrangle work in concert to serve as the center of campus. Most view corridors and pedestrian pathways lead to or emanate from the Tower, as the central campus directory is located at the Tower. There are also several support areas proposed for maintenance including a landscape Maintenance Yard at the connector road and East Campus Road.





Environmental Preserve and Vernal Pools



Black Mountain Promenade



Black Mountain Road Entry



Aviation Way



Westview Drive Entry



CET Parking and grounds

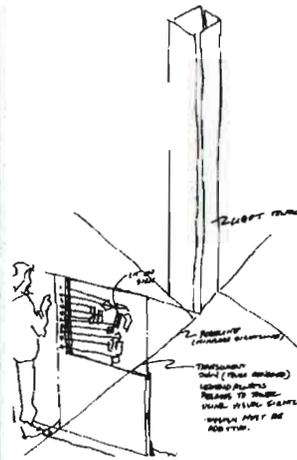


Landscape Maintenance Yards

Landscape Maintenance Shed



Principle signage types and locations



The Tower serves as a directional compass point and visual reference. Way finding signage is linked visually to the Tower along pedestrian pathways

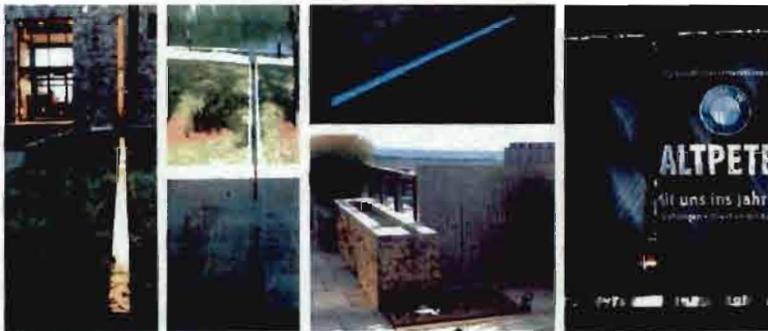
## Signage and Way Finding

Signage and campus identity function as an introduction to the campus and help define and support the campus image. Signage design is most successful when considered as part of a whole employing building materials and techniques used throughout the campus infrastructure. Two prominent points of entry are located to the north of the campus at Hillery Drive and Westview Parkway, and at the western edge of campus along Black Mountain Road. These entry points require careful consideration and redesign to service both pedestrians and vehicles and acknowledge axial view corridors and pathways prescribed by the Master Plan. Signage should also be located at all points of entry, identifying either the campus or adjacent facility (ie. Hourglass Park, Distribution Center, etc.) Parking lots should be identified in a manner that links them to their location and adjacent entry point.

Monument signage at these two principle entry points and also at other prominent corners and entries should employ a similar building language to other campus construction and materials. Consistency in lighting and landscaping design reinforce way finding and signage recognition.

The Tower is located at the intersection of the diagonal axis and the Westview Parkway corridor axis and serves as focal and destination points for pedestrian circulation. It marks the heart of campus and is bordered by the Central Quadrangle, the Promenade, and is adjacent to the Science and Technology Building, and the Student Center. All primary pedestrian egress is directed to the Tower and it serves as the campus general directory. At various intervals along these pedestrian pathways, signage markers visually referencing the Tower and the viewer's current location will be positioned to aid in way finding. These markers may be small signage monuments employing maps as guides, or may be ceramic or metal tiles cast into the hardscape akin to surveyor markers guiding the campus visitor. Signage may be designed in conjunction with pathway lighting and landscape water elements, to support landscaping and circulation systems. Way finding signage may also be employed in conjunction with building signage.

Suggested building numbering systems may be programmatic in nature, referencing building to the programs they serve, or site specific, relating buildings to adjacent outdoor spaces. Building numbering systems should be additive, allowing for new building construction in non-sequential order. Examples of programmatic numbering might be AR-100 representing the Art Classroom Building or ST-100 representing the Science and Technology Building. Examples of site specific numbering might be CQ-100 for the Science and Technology Building, identifying its relationship to the Central Quadrangle.



Light wells and waterways articulate primary axial relationships to the Tower throughout campus. Projected lighting as signage



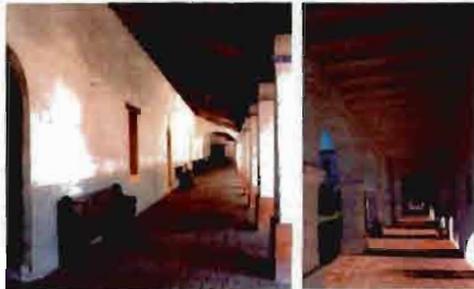
Mission San Diego de Alcalá



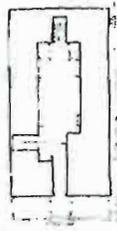
Mission San Juan Capistrano



Mission San Luis Rey



Transitional spaces are marked by materials changes, brick walkways, white plaster walls, wood rafters providing weather protection



El Greco Courtyard Apartments, plan (left) and photo (far left)



Mexican/Spanish callejon (above and left), derived from Arab dead-end streets

## Historic Context

Miramar campus is close to four historic missions, and is influenced by a multiplicity of architectural influences. Nearby missions include San Diego de Alcalá, San Luis Rey de Francia, Mission San Antonio de Pala and San Juan Capistrano. Predominant use of unadorned white paint and plaster is characteristic of mission architecture. White serves both functionally to reflect heat, and spiritually, as a symbolically sacred color. Mission walls were usually constructed of adobe or stone and structures were composed around patios and courtyards. Simple massing of form and color reflected historic building functions such as spiritual contemplation or protection against indigent uprisings.

Exterior courtyards were usually flanked by a system of corridors with deep overhangs that provided weather protection. Buttresses protected thick walls from seismic activity and resisted lateral forces from arches and domes. Red tile or flat roofs with deep overhangs protected many of the buildings and were often supported by curved gables. Lighting was usually supplied by oil or candle lamps. Bell towers called the faithful and symbolically tied the earth to the heavens.

Architect Irving Gill, a San Diego native, played an important role in exploring regional modernism in the early part of the twentieth century. He, along with other regional modernists of the period, attempted to integrate the local historic language of Spanish arches and simplified massing into a new, regional Southern California design language. Gill employed the use of "long arcades and open grassy areas that allowed indoor and outdoor spaces to interact with each other."

Other architectural influences associated with the general San Diego area include Balboa Park, an example of Spanish Baroque architecture, as well as many examples of Craftsman and Victorian architecture. Many employ the use of garden spaces, indoor/outdoor living areas, and transitional areas such as loggias or verandas for heat protection and environmental control.



Historic Images of Irving Gill's work

San Diego Historical Society, Irving Gill <http://www.sandiegohistory.org/bio/gill/gill.htm>



Aviation Building



Police Academy



Automotive Technology Center



Parking Lot at Black Mountain Road,  
Instructional Center in background



The Diesel Technology Laboratory



The Student Services Center



Arcade at the Police Academy Building

## Existing Campus Architecture

Miramar campus is composed of a number of different architectural languages. The earliest buildings are fairly minimalist, employing brick, concrete and glass in rhythmic patterning. The interiors are simple, functional and adaptive. They are one-story, and are scaled comfortably with the landscape. The older campus is well landscaped and maintained with covered eating areas, lawns and vistas, bordered by eucalyptus trees and low-growing olive. Many on campus have expressed their feeling that it is one of the "most comfortable" areas on campus.

Newer structures on campus include:

- The Police Academy, a stuccoed building with large tower housing an elevator enabling access to the steep grade change
- The Interim Library, a modular building which is very adaptive to interior reconfiguration
- The Instructional Center, housing large computer labs, classrooms, offices and lecture rooms
- The Child Development Center, a wood framed, residential-looking building, landscaped with species trees and lawn
- The Automotive Technology Career Instructional Building, a new, plastered building
- The Science and Technology Building, a white plastered, two-story structure housing classrooms and offices with an open central stair court.
- The Diesel Technology Laboratory, a plastered building, open on two-sides for truck access.
- The Health, Education, Science and Physical Conditioning Building, beginning construction at the time of this writing.

See Phasing Sequencing for Proposition "S" projects.



Child Development Center



Flagpole in front of  
Administration Building

### Campus Photo Essay

During the initial master planning process, the campus was given an assignment to visually document their needs, likes and dislikes for the future campus. Each participant was given a disposable camera and was asked to find images that could represent and help record their personal voices for the future.

The participant's comments include representations of both desirable and undesirable characteristics. Many referenced landscape images in an attempt to underscore the tremendous need and desire for landscaping on the campus. Some of the comments included requests for gazebos, trellises or overhead shading devices that could support creeping vines, shade trees, in addition to long, sweeping vistas and view corridors. Other planning considerations included the use of human-scaled architectural details, visual acknowledgement of the surrounding context in scale, color, rhythm and materials, and wider, visually recognizable entry points. The need for an inviting landscaping was a pervasive comment during this investigative process and should be acknowledged in all future building projects.



Gathering spaces



Varied paving patterns



Overhead canopies and trellis



Vine covered walkways



Water elements, textured paving, and trees



Lush landscaping and water features



Articulated thresholds, use of painting materials to soften building surfaces, mixed materials of stone and wood



Textured walls and water elements



Tree lined promenade



Outdoor seating, lawn areas, walkways with overhangs



Jade White Stone



Decomposed Granite



Blue stone



Blues from the agave plant



Color from local succulents



Structural Plastic for use as decking, trellises

## Materials and Finishes

The Master Plan recommends the prevailing use of a warm white and buff color palette throughout the campus to act as a unifying theme tying together new and old architecture. Materials using "natural" finishes may also be used to compliment white surfaces. Exterior building materials may include but are not limited to: warm white stone, plaster (rough or smooth trowelled finish), sandblasted glass, tile, concrete, concrete masonry units in warm white, and pre-patinated copper.

Suggested materials are derived from local building context, historic references and site surroundings, and conveyed programmatic meaning. For example, stone may be used to convey mass and volume, glass may convey light or transparency. Materials may reflect building structure, or may exist independent of it.

Planting materials and hardscape may be used to underscore hierarchies between outdoor spaces and can integrate building colors and materials. The use of planting materials and water features may be utilized to add interest to building facades and outdoor spaces.

Building materials and finishes should meet or exceed all code requirements including fire and off-gasing requirements, and also be durable and preferably renewable or recyclable.



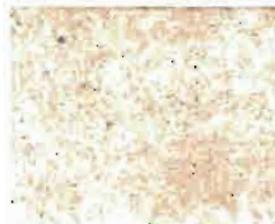
Pre-patinated copper



A range of colors from landscape and historic context



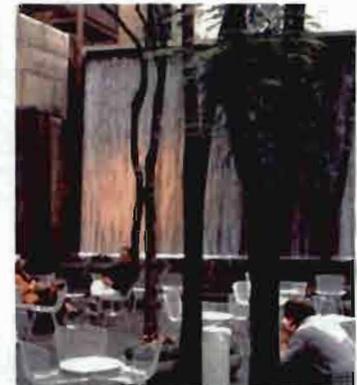
White Plaster



Buff/white color concrete masonry unit



Planting materials are easily distinguished against a white backdrop adding living color and texture



A wall of water adds texture, sound and humidity to a gathering space



*Hierarchical white masses, with prominent entry*



*White massing with controlled view corridors*

## Massing and Form

Architectural massing and form are an expression of the programmatic content of each individual building and are a response to its site location and surrounding context. Compositional interest is created by various means: between tension and transparency, by use of materiality, and by manipulation of detail and structure. Transparency in building composition is often reflected through material choices, wall cladding, glazing techniques, and reflected color. Tension can be created by juxtaposing volume and void, enclosure and opening, and traditional construction techniques counterpointed with new technology. The Campus Master Planning Committee has expressed an interest in building forms that recognize human scale and proportion. Building composition composed of a tripartite construction expressed with a base, body and cap is a preferred design strategy. Human scale can be expressed through architectural detailing, massing and material selection.



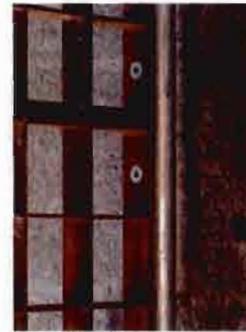
*Juxtaposition of materials and texture, rocks viewed as landscape*



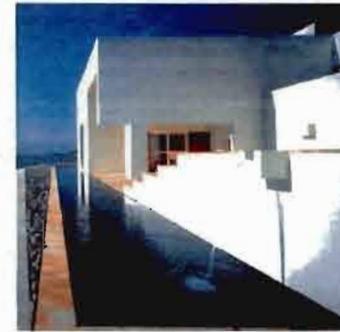
*Variety of materials creates tension*



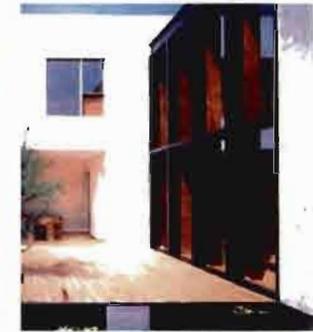
*Simple, functional massing with ground plane materiality change*



*Gate detail, metal angle sections and concrete*



*Variations in massing combine with water elements and hardscape material changes*



*Materials changes articulate programmatic changes*



*Revealed structure creates rhythm and interest*



*Simple details and materials on a human scale*



*Pivot door and threshold providing drainage and threshold transition*



*Interior lighting combined with glazing reduces need for exterior lighting*



*Combined use of traditional materials and modern technology*



*Lush landscape and water element against white building forms*



Massing used to delineate entry sequence.



Materiality changes reflect programmatic changes



Strong entry transition marked by changes in hardscape materials, narrowing tunnel leading to expansive courtyard



Structural and material rhythms delineate tripartite organization



Use of pre-patinated copper against white plaster



Interlocking grid system used differently in horizontal and vertical planes



Use of concrete (structure), brick (infill) and glass (shading and windows)



Pre-patinated copper, stone, glass and wood



Exterior lighting used to emphasize material changes



Formed concrete adds texture and human scale to large mass



Materials create massing organization



Tripartite organization (base, body, cap) reflected through material and massing



Rhythmic use of form



New blends with old through the use of material and form variety



Formed concrete massing



Interior courtyard garden

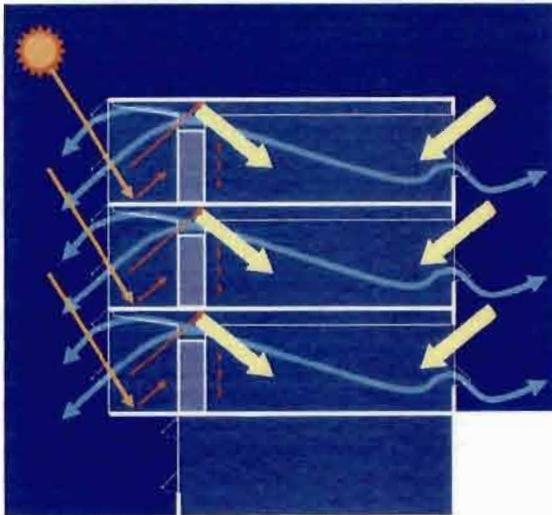


Diagram of sunlight penetration and air flow through a sustainable building.

## Sustainable Design

### Leadership in Energy & Environmental Design (LEED)

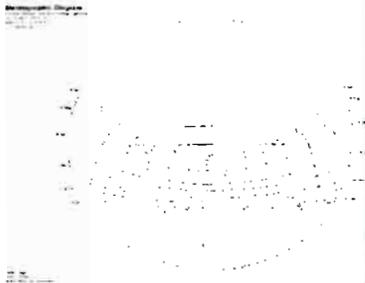
LEED is a voluntary, national standard for developing high-performance, sustainable buildings and provides a framework for assessing building performance and sustainability. The Master Plan recommends using the following checklist:

#### Checklist – Basics of Sustainable Design

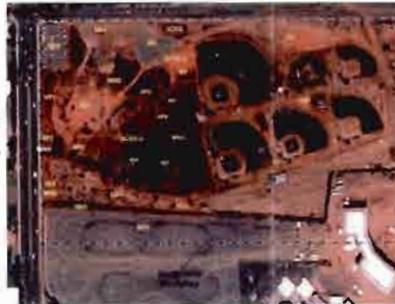
- Sustainable Sites - erosion control, environmental impact analysis, greenfield protection, brownfield redevelopment, alternative transportation sources, reduced site disturbance, stormwater management, heat island control and light pollution reduction
- Water Efficiency - water efficient landscaping, innovative water technologies, water use reduction
- Energy & Atmosphere - CFC reduction in HVAC equipment, optimize energy performance, explore renewable resource and green energy options, minimize ozone depletion
- Materials & Resources - store and collect recyclables, promote adaptive building reuse when possible, manage construction waste and reuse recyclable materials, use new products with recycled content when possible, use local/regional materials from renewable resources, encourage environmentally responsible forest management
- Indoor Environmental Quality - establish minimum indoor air quality performance, control tobacco smoke, monitor carbon dioxide in air quality, increase ventilation effectiveness, develop an indoor air quality construction plan, use materials with low VOC emissions, control indoor chemical and pollutant sources, provide occupant controls for air quality, temperature and lighting, design to maximize daylighting and view opportunities



Diagram of airflow at Universidade Agostinho Neto.



Solar diagram for Miramar College Campus site



Environmental Impact Report survey showing existing vernal and road pools

### Sustainable Sites - Site Analysis

- Isolate areas and systems requiring protection
- Identify off and on-site factors that require mitigation
- Identify soils-texture and load bearing properties
- Evaluate vegetation-endangered species, indigenous species, water tolerant species. Use vegetation to create beneficial microclimates-shaded areas in the south, control seasonable weather patterns, diurnal extremes created in hot-arid zones, vapor pressure in humid areas
- Determine slope orientation-follow natural slope to minimize grading
- Analyze solar paths to maximize daylighting and solar gain
- Test groundwater and research surface run-off. Establish watershed patterns and identify existing ground water aquifers.
- Utilize natural air movement patterns throughout buildings and landscape to provide natural climate control. Orient classrooms to southwesterly summertime breezes
- Place deciduous trees on south and east sides of buildings
- Identify adjacent development and zoning
- Identify existing climatic zones
- Examine air quality

### Support Existing Ecosystems:

- Identify potential natural hazards: flooding, seismic activity, mud slides, etc.
- Locate existing pedestrian & vehicular movement and examine possibilities for improvement
- Identify local transportation resources and infrastructure

### Alternative Transportation:

The campus should make provisions to accommodate all modes of alternative transportation and encourage ride share and other local programs. Alternative transportation may include but is not limited to public transportation, bicycles, alternative fuel vehicles, and carpools.

Black Mountain Road has been identified by SANDAG as a prime #2 collector with high traffic volume. The junction between Hillery and Westview has been designated as #3 collectors, with significant traffic flow. The Master Plan recommends that traffic and signalling studies be prepared before entries to the campus are modified, to ascertain both the street traffic flow requirements and traffic control requirements entering the campus.



Mass Transit and Bus Lines



Primary vehicular routes



A well-lit pathway using moonlighting techniques

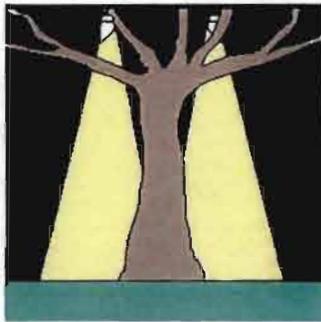


Diagram of moonlighting technique



Strip LED Lighting accents pathways and entry thresholds

## Light Pollution Reduction and Lighting Design

### Exterior Lighting:

Light pollution is generated by landscape up lighting, and a wider than necessary spread of light from exterior light sources. Light pollution is intrusive to neighbors and nearby planetary observatories and can be an unnecessary energy drain. Some communities in San Diego require that parking and other light fixtures comply with night sky or blackout regulations that may place restrictions on the type of fixture specified. Low-pressure sodium fixtures or high pressure sodium fixtures with a sharp cut-off light spread may be alternatives to standard fixtures. Safety and security should be considered in all lighting design strategies.

Suggested exterior lighting strategies include moonlighting (downlighting from trees, building overhangs, etc.) and exterior lighting that meets but does not exceed lighting requirements.

### Landscape Lighting

Suggested landscaping lighting techniques are included below. Refer to the landscaping appendix for more information.

UPLIGHTING is usually recessed lighting pointed upward to accent walls, trees, or an interesting landscape feature.

DOWNLIGHTING is a method to light pathways, parking lots and building features. Fixtures are mounted on walls or poles with reflectors. Fixture light spread and mounting height usually indicate number of fixtures required to illuminate a given area.

MOONLIGHTING, Lighting placed in trees and filtered down through tree branches to create a dappled light on a lawn, patio, or driveway.

SILHOUETTING - Lighting from behind objects or planting materials, silhouettes the object in front of the light.

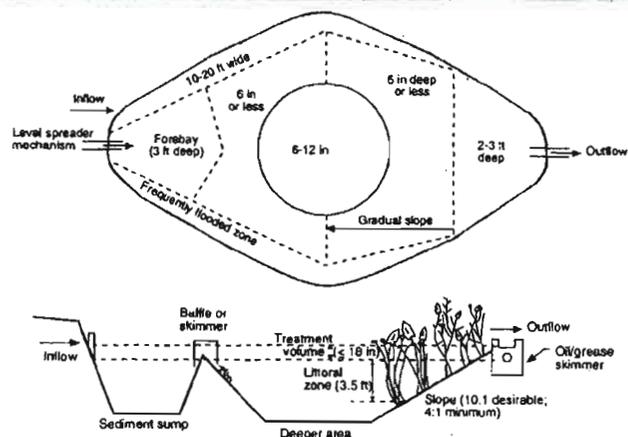
GRAZING - Lighting positioned (usually almost straight up), so that it emphasizes textured surfaces.

UNDERWATER - Lighting pool and water features. Requires special fixtures.

BORDER LIGHTS - Lighting for thresholds, transitions, to follow pathways, etc.

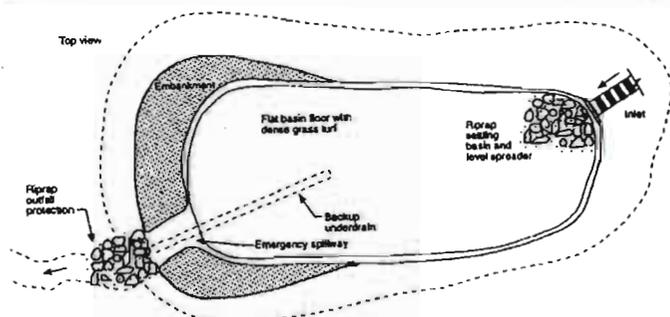
STEPLIGHTS - recessed or surface mounted lighting for steps. Light spread and placement determine number of fixtures required.

**EXAMPLE SHALLOW-CONSTRUCTED WETLAND SYSTEM FOR STORMWATER TREATMENT**



Source: Maryland Department of Natural Resources (1987), in U.S. Environmental Protection Agency, Office of Research and Development, *Urban Runoff Pollution Prevention and Control Planning*, EPA/615/R-93/004 (Washington, D.C.: GPO, 1993).

**SAMPLE INFILTRATION BASIN**



Source: U.S. Environmental Protection Agency, Office of Research and Development, *Urban Runoff Pollution Prevention and Control Planning*, EPA/615/R-93/004 (Washington, D.C.: GPO, 1993).

*Wetland systems and infiltration basin diagrams*

**Water Efficiency and Sustainability**

- Preserve mature vegetated soils
- Minimize pavement area and use porous asphalt that uses less runoff and preserves groundwater storage
- Install silt fences during construction
- Minimize irrigation, fertilizers high in nitrates, herbicides and pesticides.
- Return roof and drainage run-off to their natural runoff path.
- Construct infiltration basin to collect run-off basin should be located at lowest level of site.
- Consider graywater systems and indoor water conservation



Overhead shading and louver examples

San Diego Community College District, Miramar College Master Plan

## Energy, Atmosphere and Building Orientation

Design using passive solar heating and cooling techniques:

- Shade + airflows = summer cooling.
- Southern exposure + heat retaining material (concrete, glass) = winter heating.
- Place solar collectors for maximum solar gain.
- Locate entrances to maximize security and offer protection from elements (in this case, heat, occasional rain).
- Use sustainable materials whenever possible for furnishings, signage etc.
- Use surfaces with high albedo (surface reflectance) to reflect rather than absorb heat. Especially effective uses include hardscape, roofing, long expanses of concrete or plaster.
- Specify sustainable site construction methods. These include: eliminating unnecessary site disruption from grading, blasting and clearing and resource degradation (ground water contamination, air quality loss).
- Design the most compact building footprint possible and mass buildings together to minimize site disturbance.
- Retractable shading device with solar panels.
- Overhead shading and louver options.
- Site and orient the building to minimize the impact of climactic changes. Size and design building opening using climate as a consideration.
- Use deciduous plants, light shelves and louvers to shade southern and western building envelope.
- Choose double-paned windows with a high "R" value (measure of resistance to heat flow across a wall or window assembly) to reduce heat gain and materials fading from light exposure.
- Prevent moisture build-up within the building envelope.
- Specify building materials that reduce heat transfer. Masonry has a low rate of conductance, wood even less.
- Reduce heat islands - areas of heat gain that alter the natural climate and create an intolerable microclimate.
- Install reflective roofing materials to reduce solar gain on roof, or install solar collectors on roof.
- Utilize program partis like courtyard design to maximize interior daylighting opportunities and provide accessibility and semi-public gathering spaces.
- Examine programmatic traffic patterns to reduce waiting times for campus resources.



*Sustainable bamboo forest*



## Materials and Resources

### Building Products:

In general, choose products that are environmentally sensitive and responsible; products that are renewable and/or made from recycled products if possible, and can also be easily maintained and replaced. They should be durable and free from hazards such as raw corners, weak structural connections or unreliable materials. Use forestry products that encourage environmentally responsible, sustainable forest management. Building materials should also reflect the design intent of the campus Master Plan.

Promote efficient use of materials and provide well identified recyclable storage and collection points at each building and throughout campus.

During construction, manage construction waste by salvaging and recycling building products and land clearing waste. Establish goals for landfill diversion, balancing cut and fill areas. Designate specific, clearly marked construction recycling zones for recyclable materials.

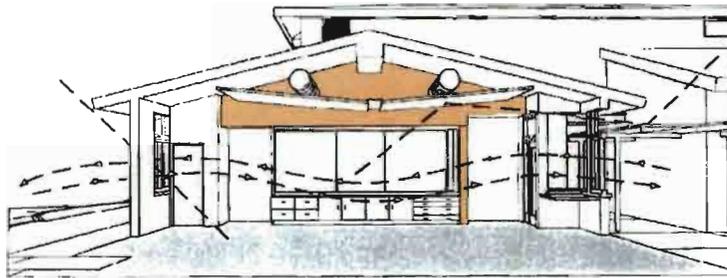
Promote adaptive reuse of existing structures and materials whenever possible. Use local/regional materials to support local economies and avoid long distance materials transportation environmental impacts and expense.



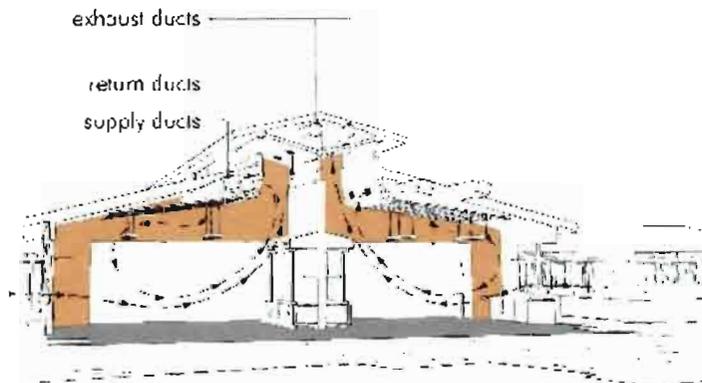
*Bamboo flooring*

*Composite wood products*

*Sustainable carpets*



Linear classroom airflow and daylight diagram



Stacked classroom airflow diagram

## Indoor Environmental Quality

### IAQ Design Guidelines and Utilities requirements:

It is recommended that new construction and remodeling projects meet the minimum requirements of ASHRE (American Society of Heating, Refrigerating and Air Conditioning Engineers) 62-2001 for indoor air quality. Mechanically ventilated spaces should meet the minimum requirements of ASHRE 55-2004 with 1995 addenda, 90.1-2001, 113-1990, and ASHRE 129-1997 for air change effectiveness. Air movement and velocity should also be calculated on a case basis for correct indoor air quality.

In general, it is important to provide individual thermal, ventilation and lighting controls in each classroom and office such as operable windows, occupancy sensors and dimming controls. Develop a maintenance program for filtration change-out.

It is also necessary to consider electric and magnetic field output in equipment selection and orientation.

### Interior Air Quality (IAQ):

Indoor air pollutants can be particularly harmful for those with allergy, asthma or airway hyper-reactivity.

Basic requirements for good IAQ should include, "avoidance of environmental tobacco smoke; avoidance of moisture/moulds in the building; avoidance of allergen sources; adequate cleaning and maintenance, practical shaping of the interior to facilitate cleaning and maintenance; good control of the maintenance of heating and ventilation to ensure a satisfactory temperature and ventilation in the classroom; adequate periodical monitoring of the IAQ parameters in schools; appropriate training of students, teachers and school staff who are responsible for management, maintenance and cleaning."<sup>2</sup>

"Controlling indoor humidity levels is a major component of good indoor air quality for an optimum-learning environment. Increased humidity levels can result in indoor microbiological growth and discomfort. Controlling indoor humidity levels while providing adequate ventilation levels can be a challenge, particularly in hot and humid climates. Methods to maintain control of indoor temperatures and humidity can dramatically differ in initial and operating costs, as well as energy usage and costs."<sup>3</sup>

## **Bibliography**

- De Haro, Fernando, and Omar Fuentes. *Mexican Architects, Space Light & Color*. 2000.
- De Moura, Eduardo. "Eduardo Souto de Moura." *Nexus 2G* (1998).
- Drain, Thomas. *A Sense of Mission, Historic Churches of the Southwest*. San Francisco: Chronicle Books, 1994.
- Fuses, Josep, and Joan Ma Viader. *Documentos de Arquitectura Series*, 53.
- Kosar, D.R., et al. 1998. *Dehumidification issues of Standard 62-1989*, ASHRAE Journal, 40: 71-75.
- Krell, Dorothy, and Paul C. Johnson. *The California Missions, A Pictorial History*. Menlo Park, CA: Sunset Books, 1979.
- Navarro Baldewig, Juan. *Juan Navarro Baldewig*. Corte Madera, CA: Ginko Press, 2001.
- Newcomb, Rexford. *Spanish-Colonial Architecture in the United States*. New York, NY: Dover Publications, 1990.
- Nierman, Daniel, and Ernesto H. Vallejo. *The Hacienda in Mexico*. Austin, TX: University of Texas Press, 2003.
- Polyzoides, Stephanos, Roger Sherwood, and James Tice. *Courtyard Housing in Los Angeles*. Princeton, NJ: Princeton Architectural Press, 1982.
- "Spanish Architecture." *El Croquis* 70 (1994).
- Young, Stanley. *The Missions of California*. San Francisco, CA: Chronicle Books, 1948.



Miramar  
Community  
College  
Facilities  
Master Plan

LANDSCAPE MASTER PLAN

San Diego Community College District

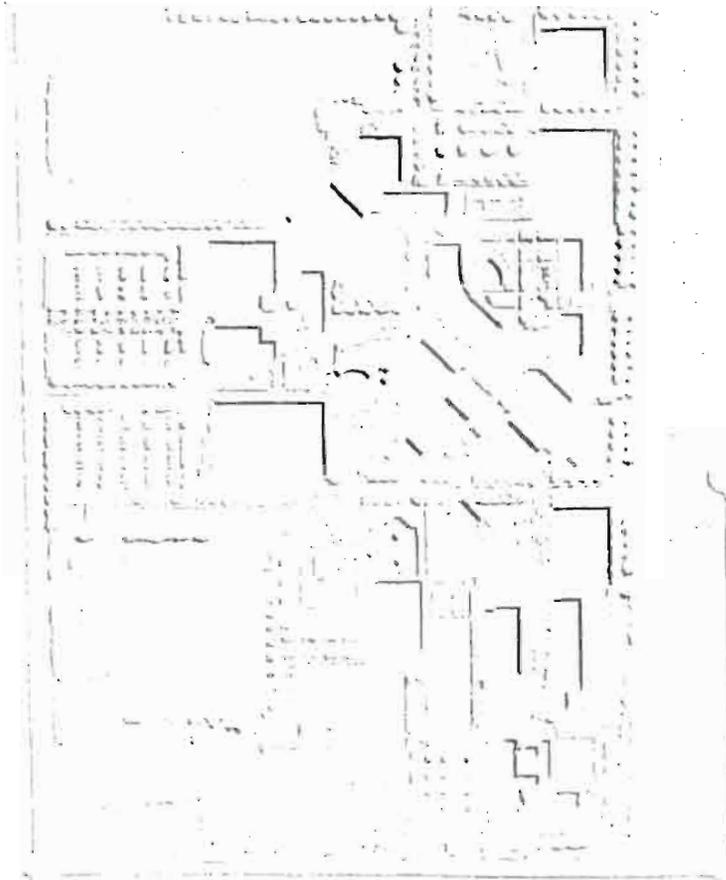
June 2005  
Updated October 2005

PERKINS  
+ WILL

**Table of Contents:**

**Landscape Master Plan**

Vision Statement .....	2
Narrative .....	3
Idea Survey Summary .....	4
Idea Survey Questionnaire .....	6
Master Plan Zone Layout .....	7
Master Plan Tree Layout .....	8
Plant Material Design Guidelines .....	9
Proposed Bio-Garden .....	11



Site Plan (Conceptual) - San Jose State University College Center Plaza

Wimmer  
Yamada  
Caughy

Wimmer Yamada and Caughy  
Landscape Architecture | Environmental Planning  
3067 Fifth Avenue  
San Diego, CA 92102  
p. 619.232.4204  
f. 619.232.0840  
http://www.wyac.com

**HELIX**  
environmental planning inc.

HELIX Environmental Planning, Inc.  
8100 La Mesa Blvd.  
La Mesa, CA 91954  
p. 619.462.1515  
f. 619.462.0952  
www.helixep.com

## MIRAMAR COLLEGE LANDSCAPE MASTER PLAN VISION STATEMENT

Based upon a thorough review of the approved campus Master Plan, the landscape architectural approach to the design of the exterior spaces of Miramar College will describe an array of options that will position the campus to carefully guide their future facility development. The intention of the Landscape Master Plan is to evolve a "kit of parts", a palette of appropriate materials which will set the standard for, but allow flexibility in, the realization of planned areas. The Landscape Master Plan is not intended to limit each individual project design as they move toward realization but rather to establish a framework to guide the planning so as to aid in creating a cohesive aesthetic over the life of the Campus. Just as the Master Plan establishes sustainable design strategies, so too will the Landscape Master Plan. Taking advantage of the pre-existing conditions in the northwestern portion of the campus to restore and subsequently protect an area with valuable ecological resources, the campus landscape will be similarly judicious in its use of natural resources elsewhere and concentrate its more resource-intensive design in areas best suited.

Correct use of the landscape elements will be a key in developing a sense of place and reinforcing the spatial arrangement of the campus as new facilities develop over time. A clear, identifiable image for the campus will be aided by a strong, definitive plant palette around the perimeter and through well articulated and aesthetically pleasing access points. Similarly, the use of a distinct species of tree for such circulation elements as the planned ring road will establish coherent wayfinding. Larger, shade trees will mitigate expanses of paving and parking. Moving from the exterior semi-public spaces of the campus into the core areas, the vegetation will be more ornamental. The scale of materials will reflect the pedestrian use of the allees and outdoor rooms. Several open areas with turf and shade trees will allow both structured and unstructured enjoyment of the favorable San Diego climate. More intimately scaled spaces will be defined with more boldly colored, finely textured materials suitable for more specific uses by the immediate buildings.

Timeless, sustainable, maintainable. These are the principles that guide the development of the landscape architectural expression at Miramar College. The campus has a unique opportunity to demonstrate a commitment to the appropriate use of new and recycled materials and to new technologies. Within the Landscape Master Plan, opportunities exist to extend the teaching/learning relationship into the exterior spaces. From outdoor classrooms to greenhouse development to the joint use of Hourglass Park with the City and the community, the College can use the exterior spaces as a full partner in their educational efforts.

## EXISTING CONDITIONS

Just slightly less than one hundred acres, the campus of Miramar College is one with a long history - from its historic origins as an airfield to the modern day development of a vibrant, growing community college. Plans for the future are ambitious - as is evidenced by the facilities proposed in the Master Plan. As with many public institutions that have evolved over time, the campus has developed without a cohesive or guiding set of criteria for its exterior spaces. The result has been that the site suffers from a distinct lack of identity in which wayfinding is difficult and the campus community discouraged by the "look" of their facility. The plant material throughout the site has been developed in an ad hoc manner and lacks the overall themes necessary to establish the various zones of the campus as a unified whole. The joint-use park in the south is green and used for active recreation. The central campus is plagued with too much asphalt and concrete and insufficient foundation planting, screening, and shade. There are no organized gathering spaces which would allow students, faculty and staff to enjoy the benefits of the temperate San Diego climate. The northern campus has a barren field currently used for a variety of activities as well as an ecologically sensitive area that has tremendous potential for use as an educational and aesthetically pleasing preserve.

## PROPOSED LANDSCAPE STATEMENT

Although no definitive individual species are proposed within the contents of the Landscape Master Plan, it is the intention of the document to help guide future development of the campus and to provide a framework for subsequent final design as each new facility is realized. The suggested materials are ones that are suitable for the climate, challenging soils conditions, and have consideration given for their longevity and maintenance needs. The general landscape concept is one in which the campus will have an identity - both in its signage, its site furnishings and its plant materials and spatial organization. The perimeter of the site will consist of larger, back-drop species, while the pedestrian alleys and ring road will have a strong, identifiable palette. The central campus will be more ornament, with the focus of the more aesthetically interesting materials clustered around building entries and gathering spaces to provide maximum impact with color and texture. Foundation plantings will reduce building scale to one more pedestrian friendly as well as provide screening for the necessary utilitarian areas. Paving materials and site furnishings will take their lead from the building architectural genre to provide a cohesive identity to the overall site. As the first building to be realized, the LLRC facility design will create and establish an appropriate landscape treatment that will set the tone for future Campus development. The materials chosen for hardscape and site furnishings, as well as the planting scheme will aid in the design of future facilities by providing a framework that will be emulated in each subsequent project.

## PROPOSED IRRIGATION/RECYCLED WATER STATEMENT

In keeping with the mandate for water conservation that is so critical to the Southwestern United States, the irrigation system for the campus facilities will employ numerous best management practices. Centrally controlled irrigation, with main and lateral line break protection, as well as appropriately design hydrozones will ensure suitable response to both plant material needs as well as consideration for drainage issues of the past. The site will be provided with a new six inch recycled water main. It will be a looped system connecting to City of San Diego recycled water mains in both Hillery Drive as well as Black Mountain Road. This recycled water main will provide adequate water and water pressure to service the existing and proposed landscape areas. The recycled water line is sized sufficiently that should the campus of the future require recycled water for industrial or building facility use, it will be adequately serviced. Complete site-by-site evaluation of each proposed building and campus area will determine the suitability for future conversion to and use of recycled water. It is understood that not every application (such as sports fields) benefits from the use and it is the intention of this Master Plan to encourage its use only when soil and horticultural conditions are appropriate.

Wimmer  
Yamada

Caughy

## IDEA SURVEY SUMMARY

In general, there is considerable consensus about the challenges facing the campus from a landscaping perspective. Similarly there is consistency of opinion about what the goals for the campus are in the long term. This information will be used to guide and prioritize future design decisions to ensure responsiveness to those items identified. More specifically:

### Primary Concerns to be Addressed:

- There is far too much hardscape - too many areas of concrete, too many expanses of asphalt and the result is an unattractive campus
- There is no unity or guiding design theme(s) present to create a sense of place for "Miramar College"
- The architecture has evolved in a "hodge-podge" manner with too little consideration given to the overall campus identity and the result is an unattractive campus that is hard to maintain
- There are no attractive, organized and functional means of circulation (paths, drives) and no green spaces for the campus community to gather in
- Access to and design of Bio-Garden is very important

### Primary Considerations to be Maintained:

- Openness of the views within/without the campus
- Green spaces such as exist in front of the T-100 building
- Accessible nature of the campus and connections with surrounding community

### Primary Visions for the Future of the Campus:

- A unique identity and strong sense of place, clear entries to campus
- A welcoming and safe environment throughout the campus
- Shady, green spaces throughout the campus to gather and congregate informally
- A landscape palette that is colorful and interesting as well as sensitive to the budget and maintenance constraints of the Campus and the District

### Considerations for Specific Campus Zones:

- Perimeter: clear identity, welcoming, formal
- Ring Road: safe, well lighted/signed, unique identity, functional for students and staff as well as maintenance vehicles
- Utility Areas: accessible but screened from sight
- Walks/Spines: wide, interesting, colorful, meandering, not asphalt
- Central Quad: open, sunny space for gathering with green perimeter
- Bio-Garden: attractive, focused on education/environmental awareness, helps establish the Campus in the community context
- Hourglass Field: integrated to rest of campus, accessible, green
- Building Perimeters: screen non-pedestrian areas with tall vegetation, blend existing and new development with consistent plant materials
- Building Entries: safe, identifiable, colorful plantings, gathering and seating places proximate

### Plant Material Characteristics Summary:

- Overwhelmingly the plant materials that were the most popular amongst all respondents were those which exhibited dramatic flowering color characteristics. Those with bright red, yellow, and purple flowers were the most favored.
- With the exception of cacti, plant form was generally a secondary concern or not mentioned.
- Cacti were not favored for any use.
- Large canopy shade trees were extremely popular with all respondents due to the strong desire for shade.
- Pine trees were not popular.

## PROPOSED LANDSCAPE THEME ZONES

Based upon the information collected in the above summarized survey conducted at the last workshop meeting, the following are the extracted ideas to be carried forward in the planning of the landscape:

### Perimeter Zone:

- Area around exterior of campus - presents image of campus to community and provides a distinct character to the campus. Perimeter should use some screening materials in utility areas, and some welcoming, distinct materials at entries to campus. Signage is critical and should be attractive and set the tone for the experience on campus and ease wayfinding.

### Bio-Garden Zone:

- Area in the northwestern corner of campus - key focal point for community. Need to balance educational/native materials/ environmental constraints with need for organized, attractive and educational space. Some limited access areas may be delineated in conjunction with some open access areas.

### Parking and Utility Zone:

- Area needs to provide larger scale tree materials to provide shade and visual mitigation from asphalt expanses. Clear wayfinding is necessary with identifiable materials. Screening of structures with large scale massings of material to provide backdrop. Distinct vehicular access with safe pedestrian links. Appropriate security lighting is critical.

### Athletics Zone:

- Integration of Hourglass Field into campus proper through key pedestrian linkages. Green park-like character to be maintained. Site soils conditions to be considered throughout campus. Wayfinding and signage and materials to help tie southern portion of site to main academic areas.

### Campus Ring Road:

- Distinct circulation route - needs identifiable tree species for ease of wayfinding. Must serve as easy vehicular corridor for campus students, staff and must provide for maintenance vehicles. Should tie in clearly with entries to campus in terms of welcoming, identifiable plant types.

### Original Campus Zone:

- As the new facilities are developed, efforts must focus on tying existing campus buildings into the new plan in a manner that encourages flow easily and directly from north to south and back. Clear, warm and wide pedestrian links must form backbone of spatial organization.

### Campus Central Zone:

- Campus quadrangle and tower plaza must function as the central core of the campus. Open grassy areas for both formal and informal gathering should be surrounded by shady congregating areas with plenty of seating and socializing areas. Brightly colored accent materials and clear directional signage shall encourage use of the central areas and should tie seamlessly into the perimeter buildings.

### Arts Zone and Technology Zone:

- Ease of wayfinding, safety and security as well as focal accents at building entries are critical. Using landscape materials against a backdrop of the building to develop themes for each area. Areas for break-out and seating will provide students and staff informal gathering areas. Shade and screening are key around buildings.

### Transportation and Admin Zone:

- Formal administrative entry to the campus from the north. Area should be very distinct and colorful with clear wayfinding. Transportation hub and visitor entry define this link to the surrounding community. Areas for shady sitting and waiting (for bus, ride, etc) critical. Formal landscaping more important than some of the more casual and relaxed areas within campus proper.

### Pedestrian Promenades:

- Key focus of wayfinding effort to draw people along a shady boulevard toward the central core of the campus. Efficient means of access and egress from parking areas to more pedestrian scale spaces. Clear articulation of paths to reach buildings shall build upon this promenade framework. Tower plaza shall form the identifiable line of sight from major pedestrian arteries. Distinct shady and colorful vegetation shall define prominent spines.

Wimmer  
Yamada

Caughney

1. **What do you think is the best/most attractive physical place/attribute of the Miramar Campus and why?**
2. **What do you think is the least attractive physical place/attribute of the Miramar Campus and why?**
3. **In your opinion, what are the three most important things for the design team to consider in developing the landscape master plan for the Campus?**
4. **What are your three greatest concerns/worries about the development of the landscape architectural master plan for the Campus?**
5. **In ten years, if someone asked you "what is the landscape of Miramar College like?", how would you like to answer them?**
6. **Please list three words or short phrases that characterize the theme/image you feel would be most appropriate for each of the following Campus zones:**

The Campus perimeter landscape: \_\_\_\_\_

The proposed Campus ring road: \_\_\_\_\_

The Campus utility areas: \_\_\_\_\_

The proposed main pedestrian spines/walks: \_\_\_\_\_

The proposed central quadrangle: \_\_\_\_\_

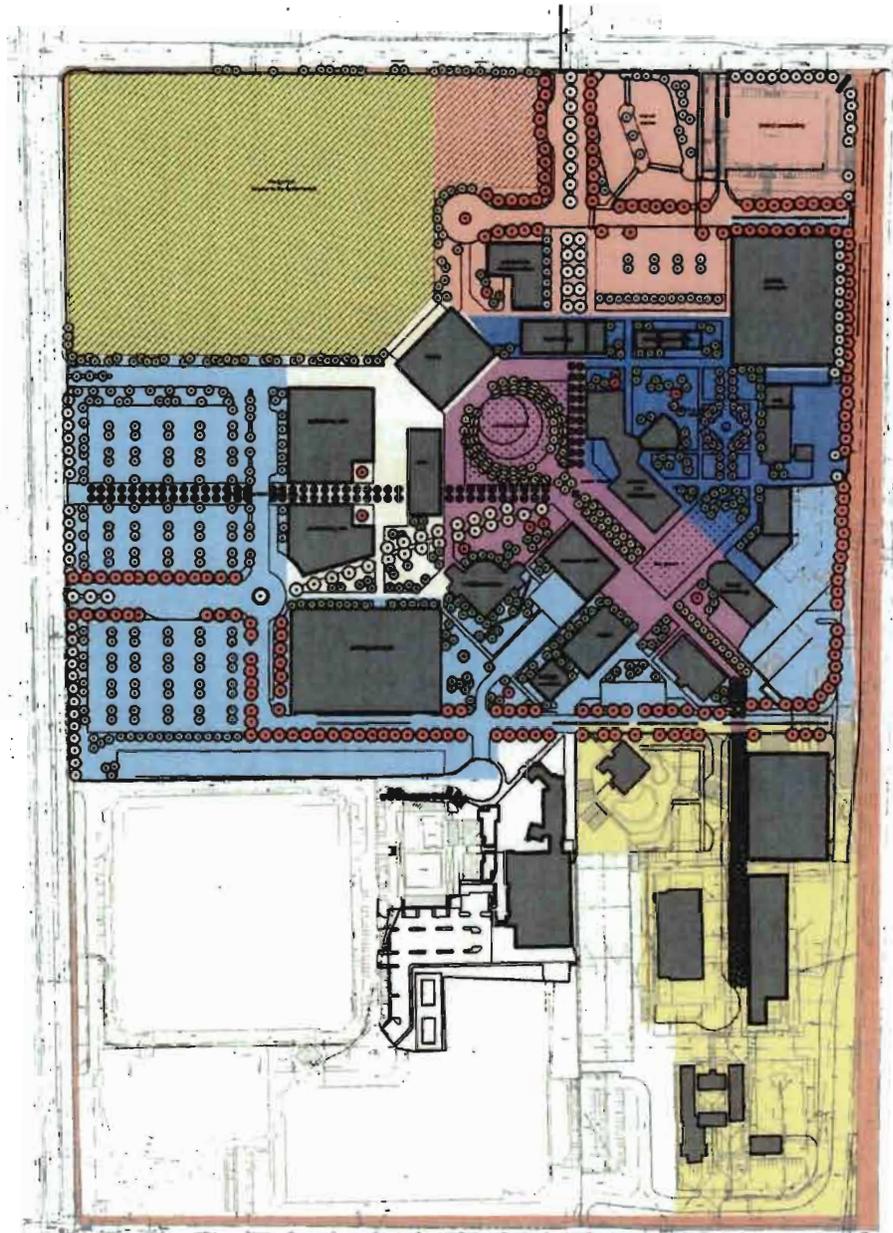
The ecological/bio-garden area: \_\_\_\_\_

The integration of Hourglass Field: \_\_\_\_\_

The building perimeters: \_\_\_\_\_

The building entry areas: \_\_\_\_\_

7. **Do you have any other thoughts or concerns you would like taken into consideration in the development of the landscape master plan?**

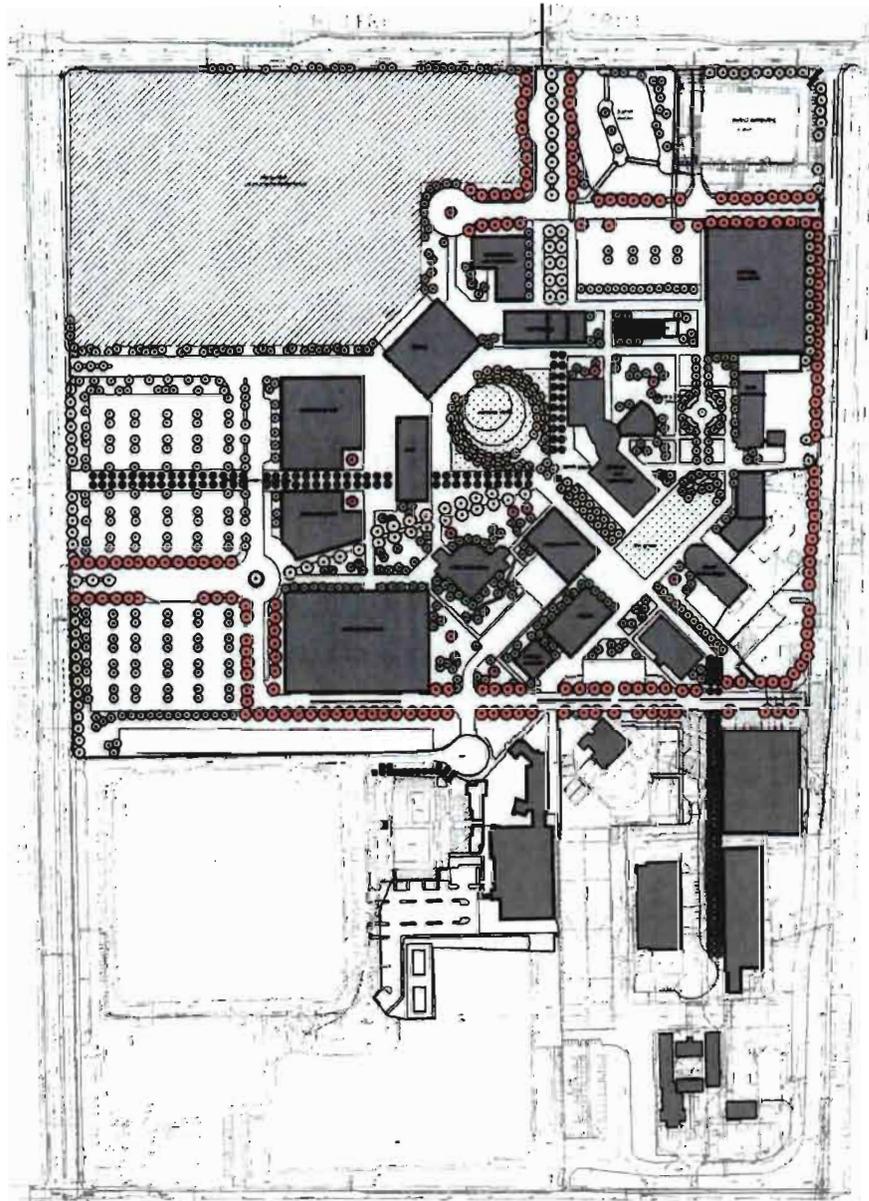


NOTE  
ZONES DEPICTED ON THIS GRAPHIC EXHIBIT ARE INTENDED AS A GUIDELINE ONLY. ALL SUBSEQUENT FACILITY DESIGN WILL BE BASED UPON PROGRAMMING UNIQUE TO EACH PROJECT. DEVELOPMENT OF THE LIRC FACILITY IS INTENDED TO ESTABLISH THE BASIS OF DESIGN OF ALL POSSIBLE ELEMENTS SUCH AS PERGOLAS, TRELLISES, SITE FURNISHINGS, LIGHTING AND ARCHITECTURALLY COMPATIBLE LANDSCAPE DESIGN.

**LEGEND:**

- |  |   |
|--|---|
|  ARTS ZONE                |  ORIGINAL CAMPUS ZONE          |
|  BIO-GARDEN ZONE          |  TRANSPORTATION AND ADMIN ZONE |
|  CENTRAL CAMPUS ZONE      |  ATHLETICS ZONE                |
|  PARKING AND UTILITY ZONE |  TECHNOLOGY ZONE               |
|  |  PERIMETER ZONE                |

Wimmer  
Yamada  
Caughy



NOTE:  
INFORMATION DEPICTED ON THIS GRAPHIC EXHIBIT ARE INTENDED AS A GUIDELINE ONLY. ALL SUBSEQUENT FACILITY DESIGN WILL BE BASED UPON PROGRAMMING UNIQUE TO EACH PROJECT. DEVELOPMENT OF THE LLRC FACILITY IS INTENDED TO ESTABLISH THE BASIS OF DESIGN OF ALL POSSIBLE ELEMENTS SUCH AS PERGOLAS, TRELLISES, SITE FURNISHINGS, LIGHTING AND ARCHITECTURALLY COMPATIBLE LANDSCAPE DESIGN.

**LEGEND:**

- |  |                      |  |                         |
|--|----------------------|--|-------------------------|
|  | RING ROAD TREES      |  | INTERIOR SHADE TREES    |
|  | ENTRY ALLEE TREES    |  | PROMENADE TREES         |
|  | QUAD/SPINE TREES     |  | PARKING LOT SHADE TREES |
|  | BIOGARDEN AREA TREES |  | SPECIALTY PLAZA TREES   |
|  | BUFFER TREES         |  | SPECIMEN TREES          |

**NOTES:**

SEE PLANTING LIST FOR DESCRIPTION OF POSSIBLE TREE SPECIES FOR EACH AREA.



**PLANT MATERIAL DESIGN GUIDELINE**

**NOTE**  
MATERIAL DEPICTED ON THIS GRAPHIC EXHIBIT ARE INTENDED AS A GUIDELINE ONLY. ALL SUBSEQUENT FACTORY DESIGN WILL BE BASED UPON PROGRAMMING UNIQUE TO EACH PROJECT. DEVELOPMENT OF THE LLRF FACILITY IS INTENDED TO ESTABLISH THE BASIS OF DESIGN OF ALL POSSIBLE ELEMENTS SUCH AS PERGOLAS, TRELLISES, SITE FURNISHINGS, LIGHTING AND ARCHITECTURALLY COMPATIBLE LANDSCAPE DESIGN.

**RING ROAD TREES**  
 ARBUTUS UNDO - STRAWBERRY TREE  
 CINCAMOMBA CAMPHORA - CAMPHOR TREE  
 EUCALYPTUS FICIFOLIA - RED FLOWERING GUM  
 LIQUIDAMBAR STYRACIFLUA PALO ALTO - PALO ALTO LIGUAMBAR  
 METROSEDIOS EXCEL SUI - NEW ZEALAND CHRISTMAS TREE  
 PLATANUS ACERIFOLIA COLUMBIA - LONDON PLANE TREE  
 TIJUANIA TIPU - TIPU TREE  
 ULMUS PARVIFOLIA - EVERGREEN ELM

**RING ROAD SHRUBS**  
**LARGE**  
 Pumbago auriculata - Cape Plumbeago  
 Rhusopaleis indica "Springtime" - Inda Hawthorn  
 Calliandra serrigata - Dwarf Powder Puff

**MEDIUM**  
 Rhusopaleis indica "Clay" - Inda Hawthorn  
 Bouganvillea "La Jolla" - Bouganvillea  
 Calliandra serrigata - Dwarf Powder Puff

**SMALL**  
 Aloe brevifolia - Red Flowering Aloe

**GROUND COVERS AND VINES**  
 Anagallis hybrid - Kangaroo Paw  
 Rosmarinus officinalis - Rosemary  
 Aeschynia calandula - Capeweed  
 Myoporum parvifolium - Myoporum  
 Cistus antarctica - Kangaroo Vine

**ENTRY ALLEE TREES**  
 BIRNIA ARGENTA - MEXICAN BLUE PALM  
 PRUNUS CERASIFERA ATROPURPUREA - PURPLE LEAF PLUM  
 SYDINGUS ROMANZOFFIANUS - OUSEN PALM  
 ULMUS PARVIFOLIA - EVERGREEN ELM

**ENTRY ALLEE SHRUBS**  
**LARGE**  
 Pumbago auriculata - Cape Plumbeago  
 Rhusopaleis indica "Springtime" - Inda Hawthorn  
 Calliandra serrigata - Dwarf Powder Puff

**MEDIUM**  
 Rhusopaleis indica "Clay" - Inda Hawthorn  
 Bouganvillea "La Jolla" - Bouganvillea  
 Paspalum tobis "Wheeler's Dwarf" - Dwarf Paspalum

**SMALL**  
 Aloe brevifolia - Red Flowering Aloe  
 Coprosma turkei - Creeping Coprosma

**GROUND COVERS AND VINES**  
 Anagallis hybrid - Kangaroo Paw  
 Rosmarinus officinalis - Rosemary  
 Aeschynia calandula - Capeweed  
 Myoporum parvifolium - Myoporum  
 Parniancinusus Involucris - Boston Ivy  
 Cistus antarctica - Kangaroo Vine  
 Ficus repens - Creeping Fig

**QUADRANGLE / PED SPINE TREES**  
 JACARANDA MIMOSIFOLIA - JACARANDA  
 KOEHLERUTERIA BIPINNATA - CHINESE FLAME TREE  
 PLATANUS ACERIFOLIA COLUMBIA - LONDON PLANE TREE  
 ULMUS PARVIFOLIA - EVERGREEN ELM  
 TIJUANIA TIPU - TIPU TREE

**QUADRANGLE / PED SPINE SHRUBS**  
**LARGE**  
 Pumbago auriculata - Cape Plumbeago  
 Rhusopaleis indica "Springtime" - Inda Hawthorn  
 Calliandra serrigata - Dwarf Powder Puff

**MEDIUM**  
 Rhusopaleis indica "Clay" - Inda Hawthorn  
 Bouganvillea "La Jolla" - Bouganvillea  
 Paspalum tobis "Wheeler's Dwarf" - Dwarf Paspalum

**SMALL**  
 Aloe brevifolia - Red Flowering Aloe  
 Nemania domestica "Gulf Stream" - Heavenly Bamboo  
 Coprosma turkei - Creeping Coprosma  
 Hebe speciosa - Red Yucca  
 Massella cernua - Nodding Hebe

**GROUND COVERS AND VINES**  
 Anagallis hybrid - Kangaroo Paw  
 Rosmarinus officinalis - Rosemary  
 Aeschynia calandula - Capeweed  
 Myoporum parvifolium - Myoporum  
 Parniancinusus Involucris - Boston Ivy  
 Cistus antarctica - Kangaroo Vine  
 Ficus repens - Creeping Fig

**SPECIMEN TREES**  
 AESCULUS CALIFORNICA - CALIFORNIA BUCKEY  
 ARBUTUS MENZIESII - MARINA STRAWBERRY TREE  
 BRANCHYDICTON ACERIFOLIA - FLAME TREE  
 BUTIA CAPITATA - PINKO PALM  
 BRYTIPHENA CAFFRA - CORAL TREE  
 FICUS RUBIGINOSA - RUSTY LEAF FIG  
 PLATANUS RACEMOSA - CALIFORNIA SYCAMORE  
 ROBIGNIA X AMBROGIA PURPUREA - PURPLE LOCUST  
 SARIRA SEPTENTRIONALIS - CHINESE TALLOW TREE  
 SPATHODRA CAMPANULATA - AFRICAN TULIP TREE  
 TABERNAEMONTANA - GOLDEN TRUMPET TREE

**SMALL**  
 Nemania domestica "Gulf Stream" - Heavenly Bamboo  
 Coprosma turkei - Creeping Coprosma

**GROUND COVERS AND VINES**  
 Anagallis hybrid - Kangaroo Paw  
 Ficus repens - Creeping Fig  
 Parniancinusus Involucris - Boston Ivy  
 Cistus antarctica - Kangaroo Vine  
 Ficus repens - Creeping Fig

**BIOGARDEN AREA TREES**  
 PLATANUS RACEMOSA - CALIFORNIA SYCAMORE  
 QUERCUS ENGLANDIANA - ENGLISH OAK  
 QUERCUS AGRIFOLIA - OAK LEAF

**BIOGARDEN AREA SHRUBS**  
**LARGE AND SMALL**  
 ENCELEA CALIFORNICA - CALIFORNIA ENCELEA  
 ERIOGONUM FASCICULATUM - CALIFORNIA BUCKWHEAT  
 MALOBA LAURINA - LAURE, SLAMAC  
 HETEROMELES ARBUTIFOLIA - TIDYON  
 OLIVIA LITTORALE - BEAVERTAIL CACTUS  
 RHUS INTEGRIFOLIA - LEMONADE BERRY  
 SALVIA APHANA - WHITE SAGE  
 SALVIA MELLEIFERA - BLACK SAGE  
 ZAUCHERIA CALIFORNICA - CALIFORNIA FUSCHIA

**GRASSES, VINES AND ANNUALS**  
 ESCHSCHOLZIA CALIFORNICA - CALIFORNIA POPPY  
 LONICERA HISPIDULA - CALIFORNIA HONEYBUCKLE  
 LUPINUS ARBORIS - LUPINE  
 NASSELLA PULCHRA - PURPLE NEEDLE GRASS

**CAMPUS BUFFER / PERIMETER TREES**  
 CALOCEDRUS DECURRENS - INCENSE CEDAR  
 CERCIS DE OODORA - OGDONIA CEDAR  
 CESTIS RETICULATA - HETLEAF HAZELBERRY  
 PINUS TORREYANA - TORREY PINE  
 PINUS MULEPENSIS - ALPINE PINE  
 PISTACHIA CHINESE - CHINESE PISTACHE  
 QUERCUS VIRGINIANA - SOUTHERN LIVE OAK  
 SPATHODRA CAMPANULATA - AFRICAN TULIP TREE

**CAMPUS BUFFER / PERIMETER SHRUBS**  
**LARGE**  
 ACACIA LONGICOMA - Sydney Outen Vriete  
 Ostrya vespa - Purple Hoopwood Bush  
 Eucalyptus canaliculata - White of Madras  
 Rhus integrifolia - Lemonade Berry  
 Hebe speciosa - Red Yucca  
 Leptospermum scoparium - New Zealand Tea Tree  
 Camellia japonica - Santa Barbara Camellia

**MEDIUM**  
 ARAUCARIA CALIFORNICA "Canyon Grey" - California Saguobush  
 ACACIA NEOLANDICA - Redback Acacia  
 CORYMBIA GONOLIA - California Elm  
 RIBES SPECIOSUM - Fuchsia Flowering Gooseberry  
 LEUCOPHYLLUM CANADENSE - Canada  
 JARDINEA CALIFORNICA - Chumbea

**SMALL**  
 EUCALYPTUS CALIFORNICA - California Escabe  
 ARAUCARIA CALIFORNICA "Canyon Grey" - California Saguobush  
 RHAMNUS CALIFORNICA "Zaner" - Coffeeberry  
 ROSE STEVENSONIUM - Chinese Plum  
 ACOCHNEA SERRATA - Capeweed  
 MYOPORUM PARVIFOLIUM - Myoporum

**GROUND COVERS AND VINES**  
 Calliandra californica - Sage Fairy Duster  
 Anagallis hybrid - Kangaroo Paw  
 Rosmarinus officinalis - Rosemary  
 Cistus antarctica - Kangaroo Vine  
 Ficus repens - Creeping Fig

**SPECIALTY PLAZA TREES**  
 CERCIS OCCIDENTALIS - WESTERN REDBUD  
 ERIOBOTRYA DEFLEXA - BROWN LOOKAT  
 JACARANDA MIMOSIFOLIA - JACARANDA  
 LAGERSTROMIA INDICA "NARCOSEE" - CHINE MYRTLE  
 LIQUIDAMBAR STYRACIFLUA PALO ALTO - PALO ALTO LIGUAMBAR  
 PRUNUS CERASIFERA "KRAUTER VESUVIUS" - PURPLE LEAF PLUM  
 PRUNUS FRILLOBA MULTIPLEX - PINK FLOWERING ALMOND

**SPECIALTY PLAZA SHRUBS**  
**LARGE**  
 Rhusopaleis indica "Springtime" - Inda Hawthorn  
 Calliandra serrigata - Dwarf Powder Puff

**MEDIUM**  
 Rhusopaleis indica "Clay" - Inda Hawthorn  
 Bouganvillea "La Jolla" - Bouganvillea  
 Paspalum tobis "Wheeler's Dwarf" - Dwarf Paspalum

**SMALL**  
 Nemania domestica "Gulf Stream" - Heavenly Bamboo  
 Coprosma turkei - Creeping Coprosma

**GROUND COVERS AND VINES**  
 Anagallis hybrid - Kangaroo Paw  
 Ficus repens - Creeping Fig  
 Parniancinusus Involucris - Boston Ivy  
 Cistus antarctica - Kangaroo Vine  
 Ficus repens - Creeping Fig



**PLANT MATERIAL DESIGN GUIDELINE**

**NOTE:** MATERIAL DEPICTED ON THIS GRAPHIC EXHIBIT ARE INTENDED AS A GUIDELINE ONLY. ALL SUBSEQUENT FACILITY DESIGN WILL BE BASED UPON PROGRAMMING UNIQUE TO EACH PROJECT. DEVELOPMENT OF THE LLRC FACILITY IS INTENDED TO ESTABLISH THE BASIS OF DESIGN OF ALL POSSIBLE ELEMENTS SUCH AS PERGOLAS, TRELISES, SITE FURNISHINGS, LIGHTING AND ARCHITECTURALLY COMPATIBLE LANDSCAPE DESIGN.

**CAMPUS INTERIOR / FOUNDATION / SCREENING TREES**

- AGONIA FLEXUOSA - PEPPERMINT TREE
- ALNUS RHAMNIFOLIA - WHITE ALDER
- ARBUTUS UNEDO - STRAWBERRY TREE
- BRACHYCHITON POPULINEUS - BOTTLETREE
- PERIODA SELLOWIANA - PINEAPPLE GUAVA
- GINKGO BILOBA - MADEIRA TREE
- MAGNOLIA GRANDIFLORA - MAGNOLIA
- MELALEUCA QUINCLENERVA - CAJUPUT TREE
- METROSIDEROS EXCELSUS - NEW ZEALAND CHRISTMAS TREE
- SYAGRUS ROMANCOFFIANA - QUEEN PALM
- TABELERA CHRYSOTRICHA - GOLDEN TRUMPET TREE



**CAMPUS INTERIOR / FOUNDATION / SCREENING SHRUBS**

- LARGE**
- Rhaphiophloeos sulcata - Cape Plumbeago
  - Rhaphiophloeos indica 'Springtime' - India Hawthorn
  - Callandera amargillata - Dwarf Powder Puff
  - Fraxinopanax californicum - California Fraxinella
- MEDIUM**
- Rhaphiophloeos indica 'Clear' - India Hawthorn
  - Bougainvillea 'La Zola' - Bougainvillea
  - Mitrasporium laeve 'Whodunnit's Dwarf' - Dwarf Philadelphium
  - Yucca schottigera - Nehava Yucca
- SMALL**
- Aloe brevifolia - Red Flowering Aloe
  - Mandevilla domestica 'Gulf Stream' - Heavenly Bananna
  - Coprosma terka - Creeping Coprosma
- GROUND COVERS AND VINES**
- Amphicarpus hybridus - Kangaroo Paw
  - Rosemarinus officinalis - Rosemary
  - Arctostaphylos californica - Capewood
  - Mycoporum bahianum - Myoporum
  - Parthenocissus Hiccupulata - Boston Ivy
  - Cissus antarctica - Kangaroo Vine
  - Ficus repens - Creeping Fig



**PROMENADE TREES**

- METROSIDEROS EXCELSUS - NEW ZEALAND CHRISTMAS TREE
- PHYLIS CALLERYANA CHANTICLEER - CHANTICLEER PEACH
- SOPHORA JAPONICA - JAPANESE PAGODA TREE
- ULMUS PARVIFLORA - CHINESE EVERGREEN ELM



**PROMENADE SHRUBS**

- LARGE**
- Rhaphiophloeos sulcata - Cape Plumbeago
  - Rhaphiophloeos indica 'Springtime' - India Hawthorn
  - Protea a Heenan 'Bermingham' - Birmingham Protea
  - Callandera amargillata - Dwarf Powder Puff
- MEDIUM**
- Rhaphiophloeos indica 'Jack Evans' - India Hawthorn
  - Bougainvillea sp. 'California Gold'
  - Dialia decor - Fairlight Lily
- SMALL**
- Aloe brevifolia - Red Flowering Aloe
  - Mandevilla domestica 'Gulf Stream' - Heavenly Bananna
  - Coprosma terka - Creeping Coprosma
- GROUND COVERS AND VINES**
- Amphicarpus hybridus - Kangaroo Paw
  - Rosemarinus officinalis - Rosemary
  - Yucca mini - Nehava Yucca
  - Mycoporum bahianum - Myoporum
  - Parthenocissus Hiccupulata - Boston Ivy
  - Cissus antarctica - Kangaroo Vine
  - Ficus repens - Creeping Fig
  - Baccharis pilularis 'Twin Peaks' - Dwarf Coyote Bush



**PARKING LOT SHADE / UTILITY AREA TREES**

- ACER SACCHARINUM - SILVER MAPLE
- ARBUTUS UNEDO - STRAWBERRY TREE
- LINDOODORON TULIPIFERA - TULIP TREE
- METROSIDEROS EXCELSUS - NEW ZEALAND CHRISTMAS TREE
- PHYLIS LANZEA - AFRICAN SUMAC
- TRISTANIA CONFERTA - BRISBANE BOX



**PARKING LOT SHADE / UTILITY AREA SHRUBS**

- LARGE**
- Bananaea hesperalis - Pink Mistflower
  - Plumbago auriculata - Cape Plumbeago
  - Rhaphiophloeos indica 'Springtime' - India Hawthorn
  - Callandera amargillata - Dwarf Powder Puff
- MEDIUM**
- Cornus latifolia - Seppel's Rockrose
  - Callandera Concha - California Lily
  - Ribes speciosum - Fuchsia Flowering Gooseberry
  - Rhaphiophloeos indica 'Clear' - India Hawthorn
- SMALL**
- Erwinia californica - California Fuchsia
  - Artemisia californica 'Canyon Gray' - California Sagebrush
  - Aloe brevifolia - Red Flowering Aloe
  - Pentstemon parryi - Parry's Penstemon
- GROUND COVERS AND VINES**
- Amphicarpus hybridus - Kangaroo Paw
  - Rosemarinus officinalis - Rosemary



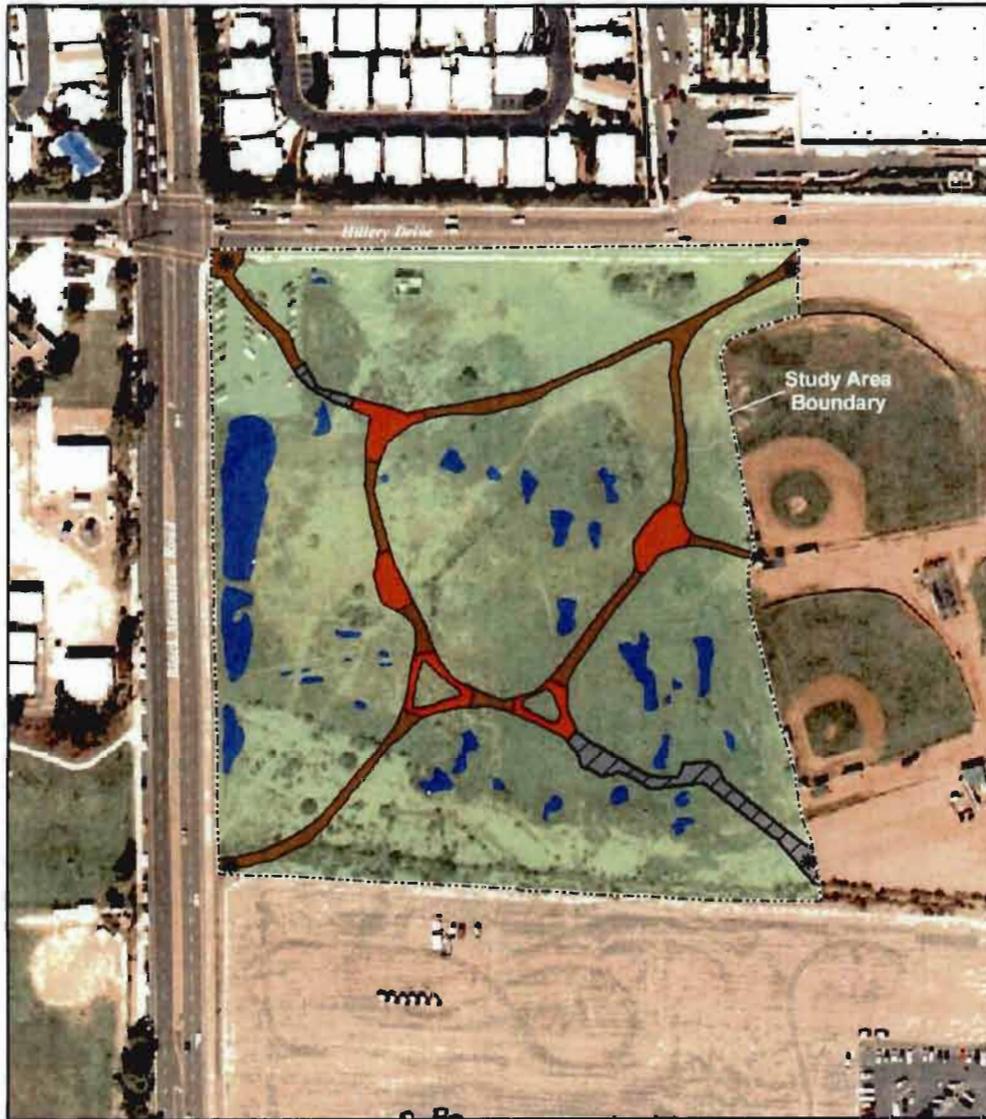
**GATHERING AREA TURF GRASS**

- AGRONO TEC BALL FIELD MIX 7-A

## BIO-GARDEN CONCEPT STATEMENT

The northwest corner of the campus is planned to become an interpretive bio-garden. The bio-garden will provide Miramar College students and the surrounding community access to some of the historic ecosystems of California including rare vernal pool and coastal sage habitats. A system of pedestrian trails and raised boardwalks will provide access through the preserve without impacting sensitive habitat areas. Trails would be primarily at-grade and constructed of decomposed granite. Elevated walkways constructed of wood or recycled plastic would be used where at-grade walks could adversely affect vernal pool watershed drainage patterns. Interpretive signage will include interesting ethno-botanical facts about the unique properties of the plant material and how Native Americans utilized them.

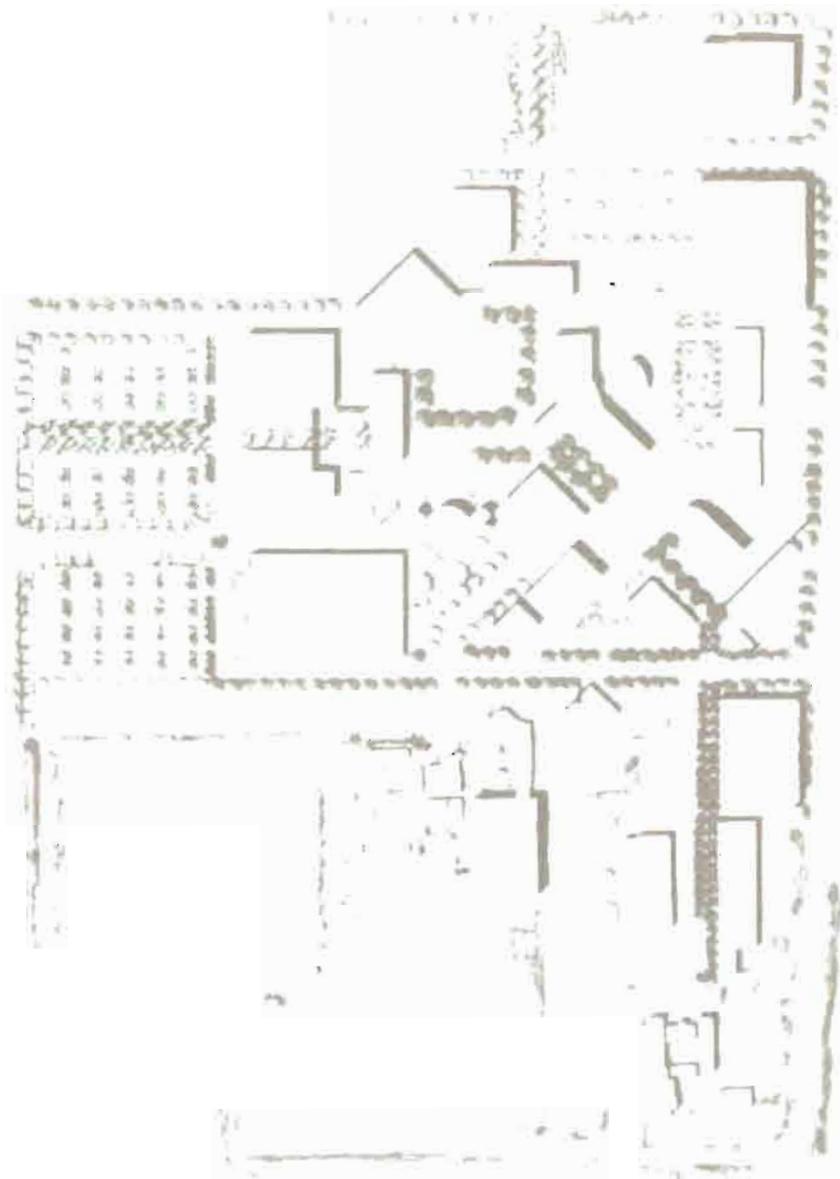
The interpretive trail alignments indicated on the concept plan are viewed as representative of many possible design solutions. While they do avoid impacts to sensitive vernal pools and associated watersheds other options are possible. Final trail alignments and location of interpretive nodes will be determined after the completion of interactive workshops with interested stakeholders.



J:\062\FPA1314\Musical College Map Package\Conc. EDC1314.rvt



-  Existing Vernal Pool
-  Elevated Boardwalk
-  Decomposed Granite Path
-  Interpretive Node
-  Ecosystem Enhancement/Education Area
-  Biological Garden Information Signage

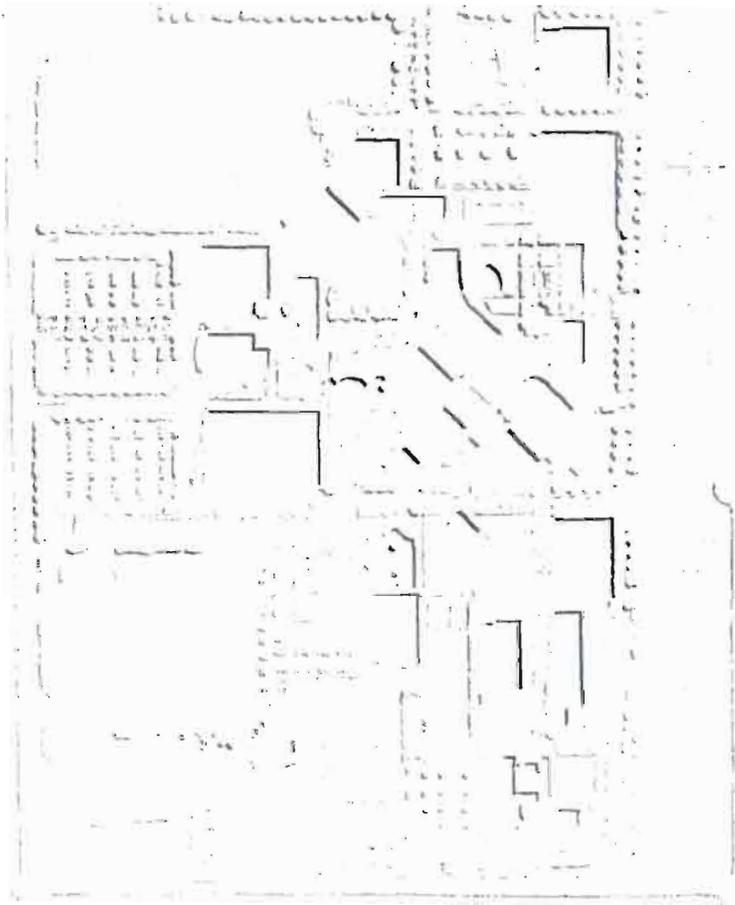


Miramar  
Community  
College  
Facilities  
Master Plan

UTILITY MASTER PLAN

San Diego Community College District  
June 2005

PERKINS  
+ WILL



**Table of Contents:**

**Civil Utilities Master Plan**

Narrative ..... 2

Storm Drain - Phase I ..... 3

Storm Drain - Phase II ..... 4

Storm Drain - Phase III ..... 5

Water - Phase I ..... 6

Water - Phase II ..... 7

Water - Phase III ..... 8

Sewer - Phase I ..... 9

Sewer - Phase II ..... 10

Sewer - Phase III ..... 11

**Electrical/Signal Utilities Master Plan**

Narrative ..... 12

Power - Phase I ..... 16

Power - Phase II ..... 17

Power - Phase III ..... 18

Signal - Phase I ..... 19

Signal - Phase II ..... 20

Signal - Phase III ..... 21

**Building Energy Utilities Master Plan**

Narrative ..... 22

Site Piping - Existing Conditions ..... 25

Site Piping - Phase I ..... 26

Site Piping - Phase II ..... 27

Site Piping - Phase III ..... 28

Central Plant - Existing Conditions ..... 29

Central Plant - Phase I ..... 30

Central Plant - Phase II ..... 31

Central Plant - Phase III ..... 32

Heating and Cooling Load Tables ..... 33



## SITE DESCRIPTION

The site approximately is 98.6 acres located on the eastern side of Black Mountain Road Between Hillery Drive to the north and Gold Coast Drive to the south. In the City of San Diego, California. The southwestern portion (Hourglass Field Community Park) is maintained as a joint-use recreation area with the City of San Diego and includes soccer fields, softball fields, and an aquatic center. The site is relatively flat with elevations generally between 494 and 530 feet above mean sea level.

## BENCH MARK

City of San Diego Brass Plug at the Northeast curb return at intersection of Hillery Drive and Black Mountain Road elevation = 493.481 M.S.L.

## SOILS CONDITIONS

According to limited Geotechnical evaluation prepared by Ninyo & Moore Geotechnical and Environmental Sciences Consultants dated May 4, 2004. The following geotechnical factors should be considered in the planning and implementation of the project:

- The Rose Canyon Fault has been mapped approximately 8 miles to the west of the site. Accordingly, the site has a potential for moderate ground motions due to an earthquake on the active Rose Canyon Fault. Therefore, the potential for moderate seismic accelerations will need to be considered in the design of proposed structures of improvements.
- Fill soils are present on the southern side of the site. The condition of these fill soils is not known and they may be subject to settlement under foundation loads. To mitigate the potential for future settlement. These soils may need to be removed and replaced as properly compacted fill if future structures are planned in these areas.
- Future buildings may be underlain by a cut/fill transition and be subject to differential settlement. In order to mitigate the potential for differential settlement. Where a cut/fill transition line extends beneath a proposed building location, the cut portion of the pad should be undercut an amount equal to one-third or more of the deepest fill depth beneath the structure or 3 feet. Whichever is greater, and replaced with compacted fill.

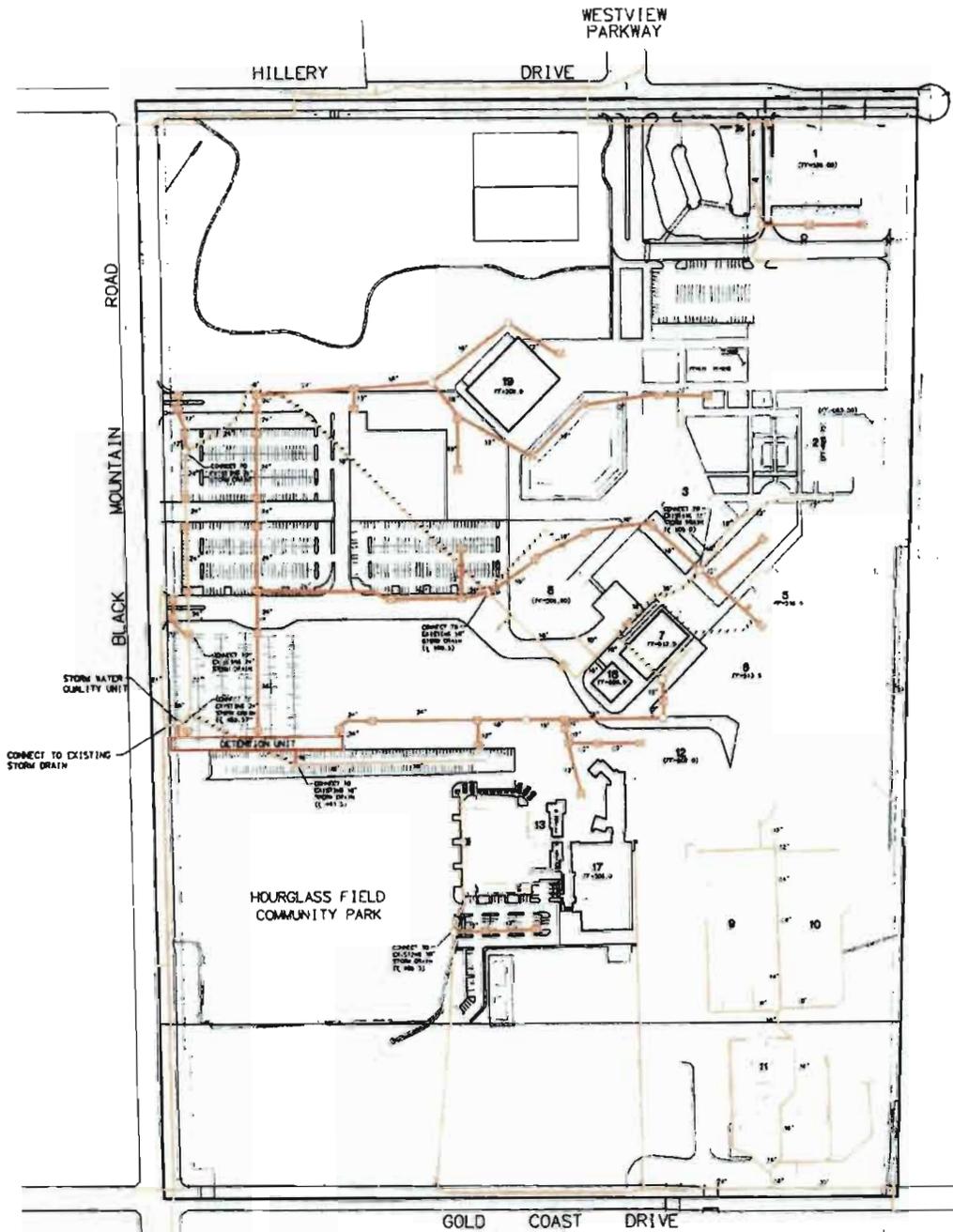
## SITE GRADING AND DRAINAGE

Currently most of the site is graded and drains toward Black Mountain Road. The new site Grading and Storm Drain System will continue to drain to the same location. This includes all new catch basins and roof drain connections for new buildings. The proposed finished floor building elevations will tie in with the existing terrain and will include ADA path of travel from public streets, from building to building and from disabled parking stalls to main entrances of buildings. The area of inadequate drainage north of Building 9 will be addressed during Phase II. The City of San Diego Requires Storm Water Detention to restrict the Storm Drain Runoff quantity to current conditions and also requires a Storm Water Quality Unit to treat the storm water before it enters the Public System. The new storm drain system design will meet the City of San Diego's Standard Urbanized Stormwater Management Plan (SUSMP) requirements.

## WATER AND SEWER

The new 10" water loop is a separate water system to be connected to an existing water service located on the East side of the site and a new connection on Hillery Drive. The new loop includes water and fire services to each of the new buildings. The existing loop will remain in-place where possible. In locations where the existing loop is in conflict with new buildings the water line will be removed and will be re-routed to re-connect to the existing line.

The new 8" sewer main point of connection is located on the western portion of the site. The existing sewer line will remain in-place where possible. In locations where the existing loop is in conflict with new buildings the sewer line will be removed and will be re-routed to re-connect to the existing or new line.

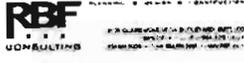


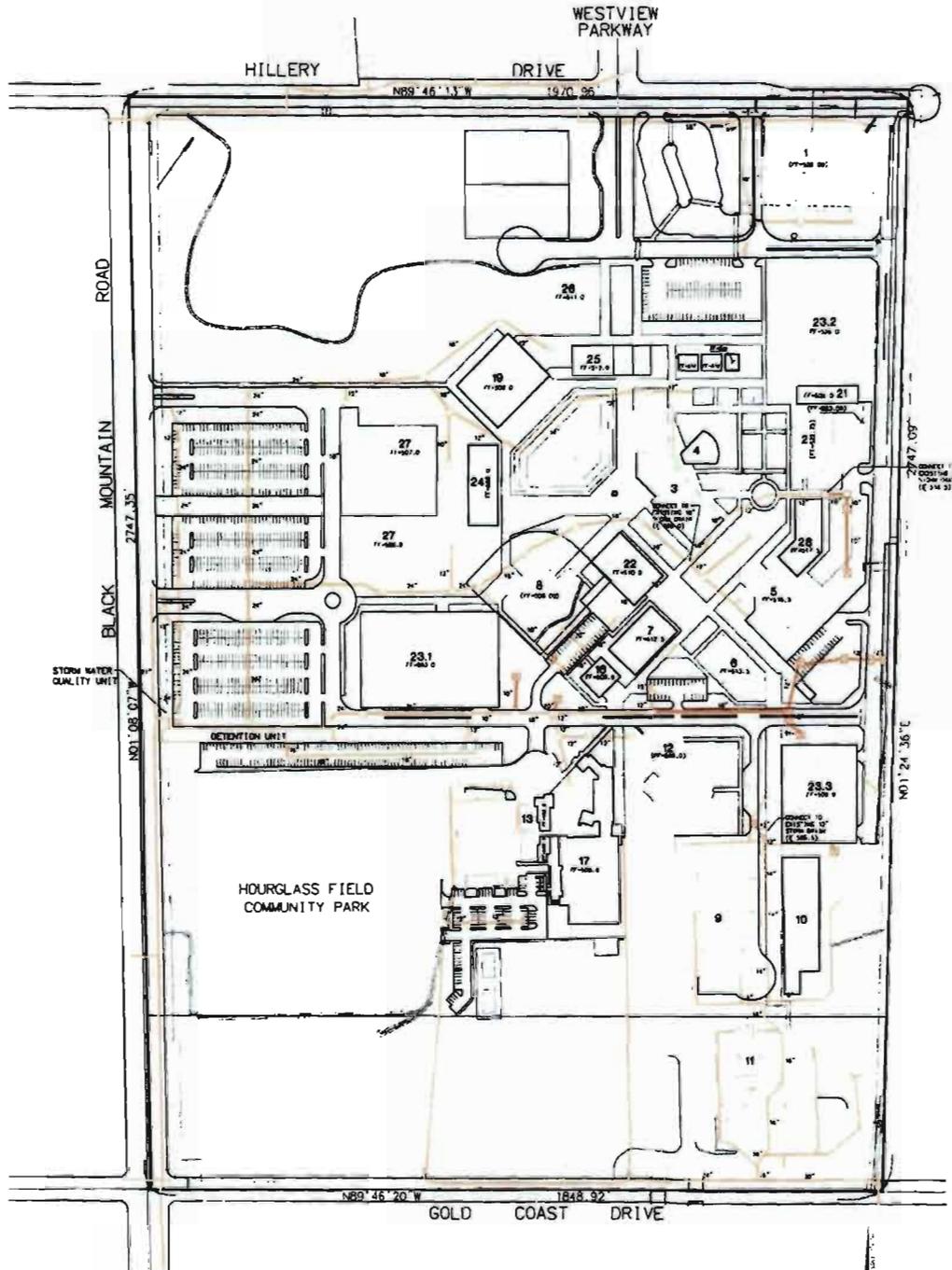
**LEGEND:**

- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PIPE IMAGE SHEET
- CLEAN OUT
- EXISTING STORM DRAIN TO BE REMOVED OR ABANDONED

**NOTES:**

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.
2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.





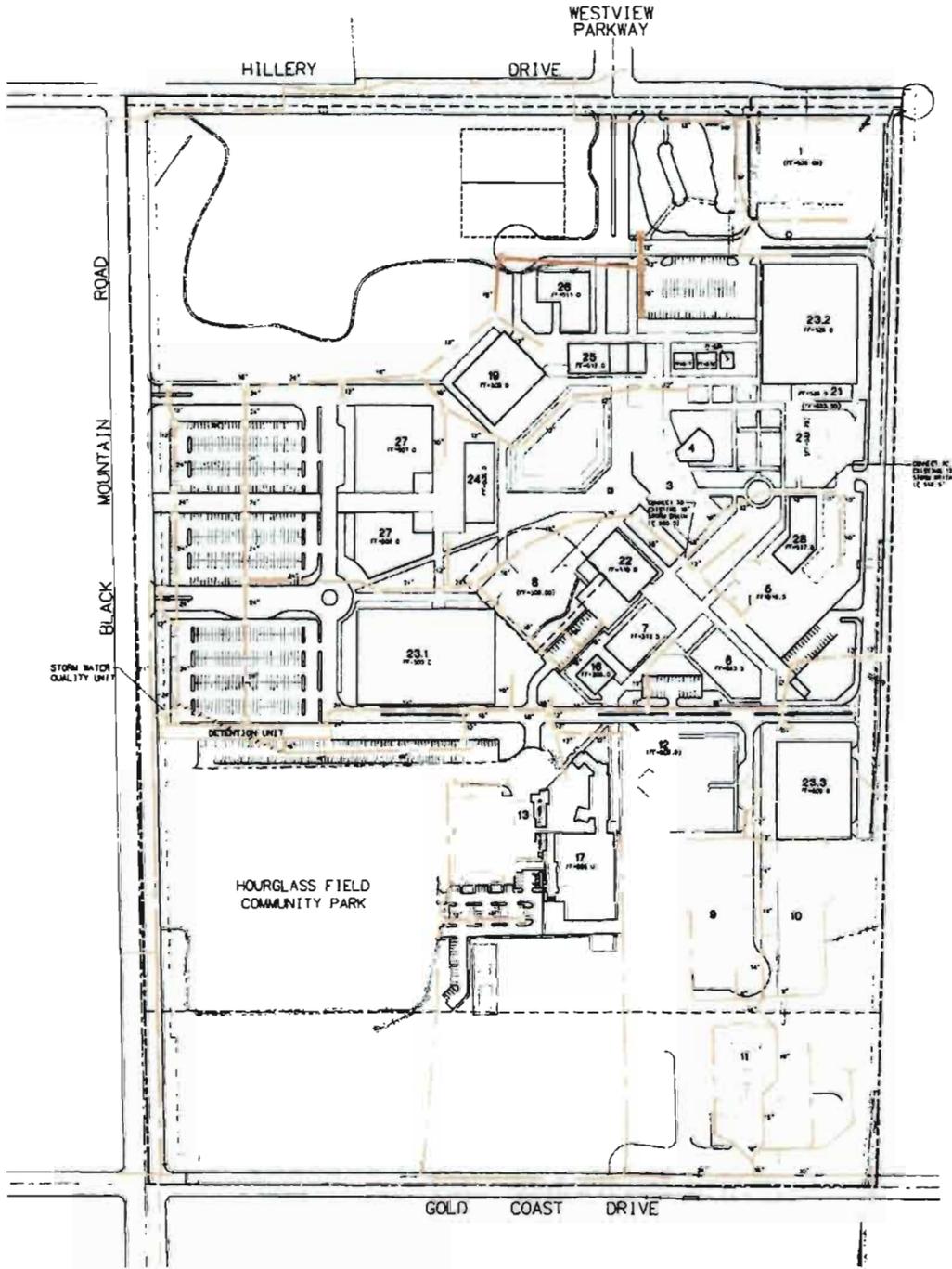
**LEGEND:**

- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- DRAINAGE INLET
- CLEAN OUT
- EXISTING STORM DRAIN TO BE REMOVED OR ABANDONED

**NOTES:**

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.
2. ALL PROPOSED PIPES SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.





**LEGEND:**

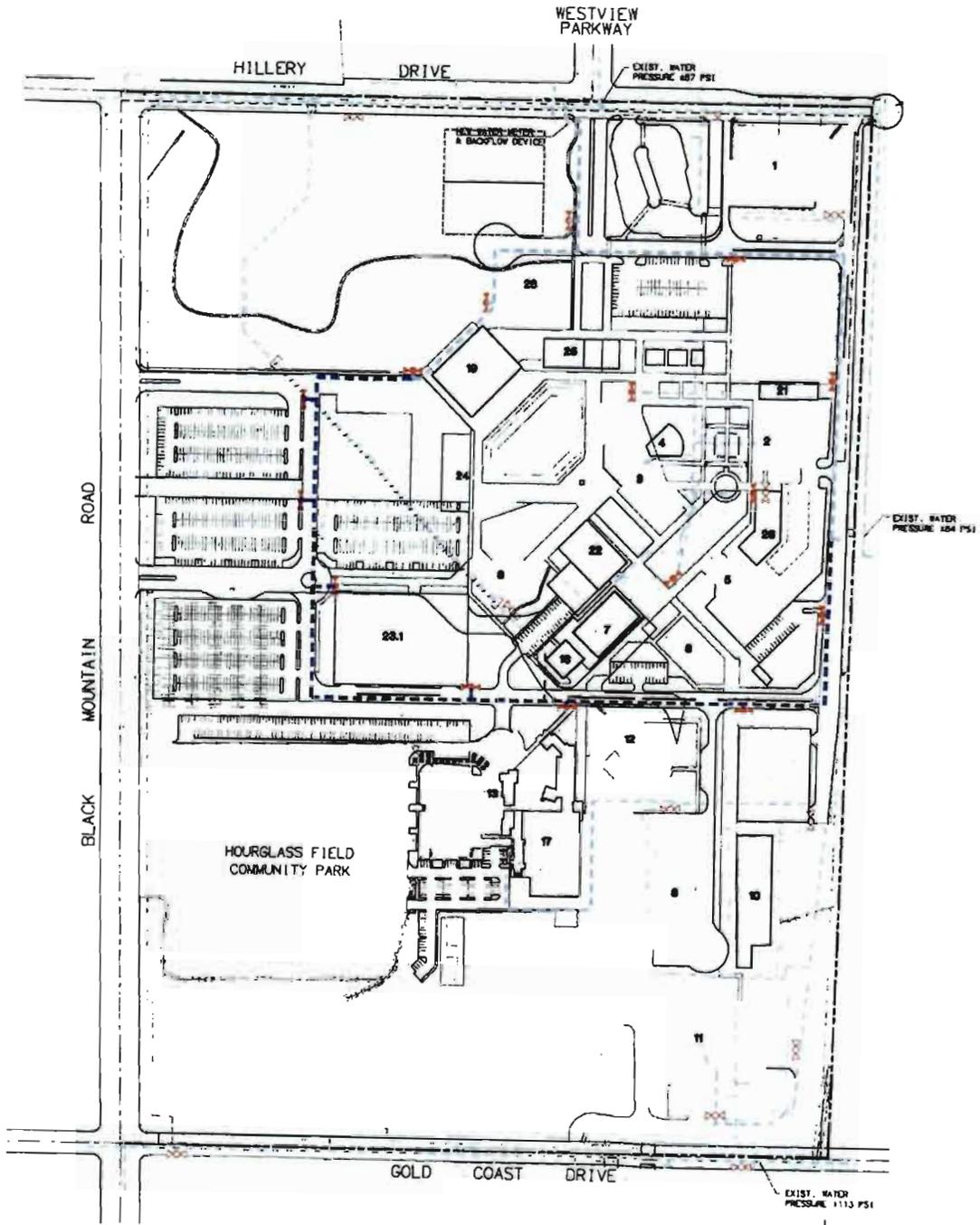
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- DRAINAGE INLET
- CLEAN OUT
- EXISTING STORM DRAIN TO BE REMOVED OR ABANDONED

**NOTES:**

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.
2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.





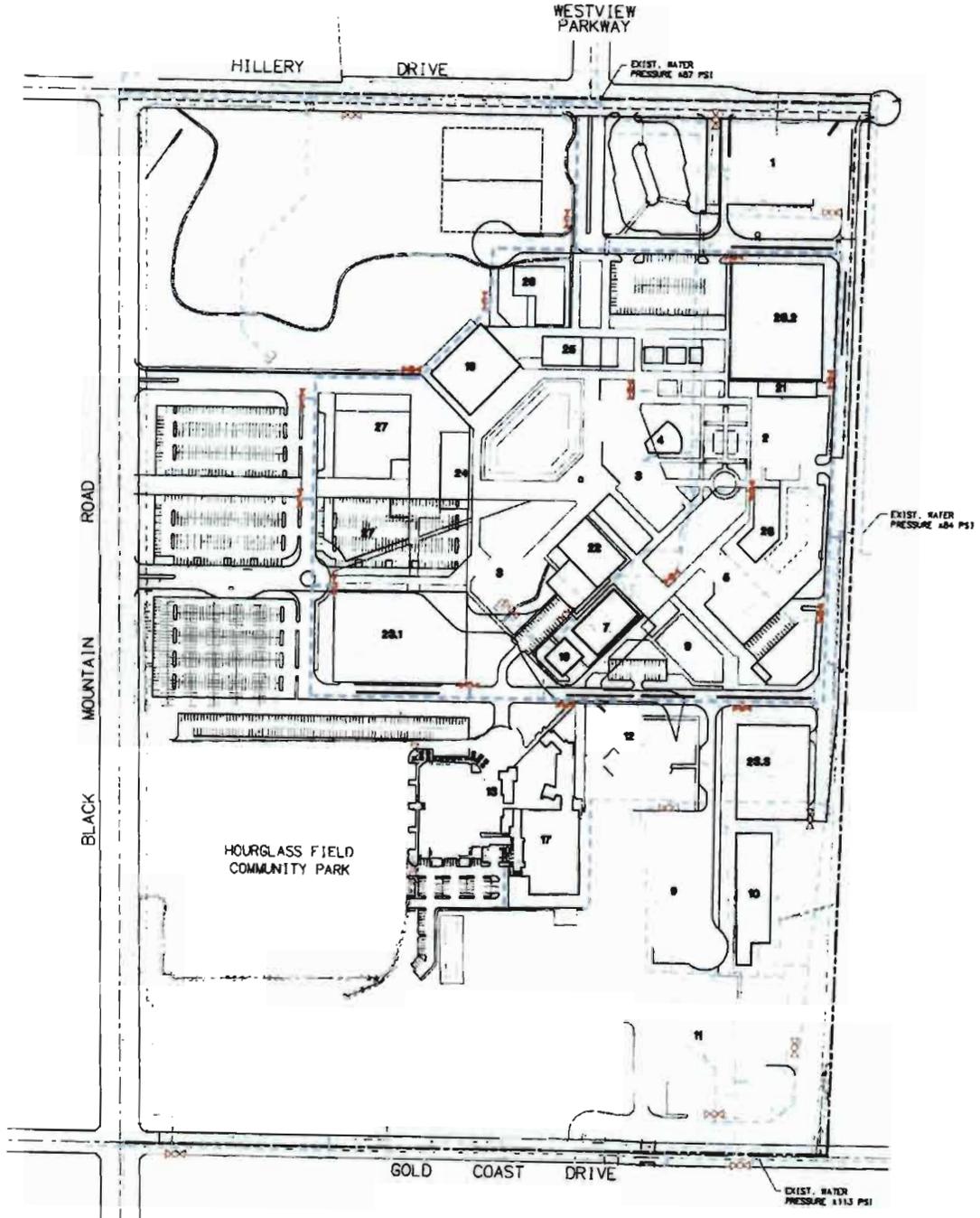


**LEGEND:**  
 PROPOSED 10" WATER MAIN [Blue dashed line]  
 EXISTING WATER [Black solid line]  
 PROP. FIRE HYDRANT [Red solid line]  
 EXIST. FIRE HYDRANT [Green solid line]  
 EXISTING WATER TO BE REMOVED OR ABANDONED [Red dashed line]

**NOTES:**  
 1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.  
 2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.



**RBF**  
 CONSULTING  
 ENGINEERING & ARCHITECTURE  
 1000 WEST 10TH AVENUE, SUITE 100  
 DENVER, COLORADO 80202  
 PHONE: 303.733.8888  
 WWW.RBFCONSULTING.COM



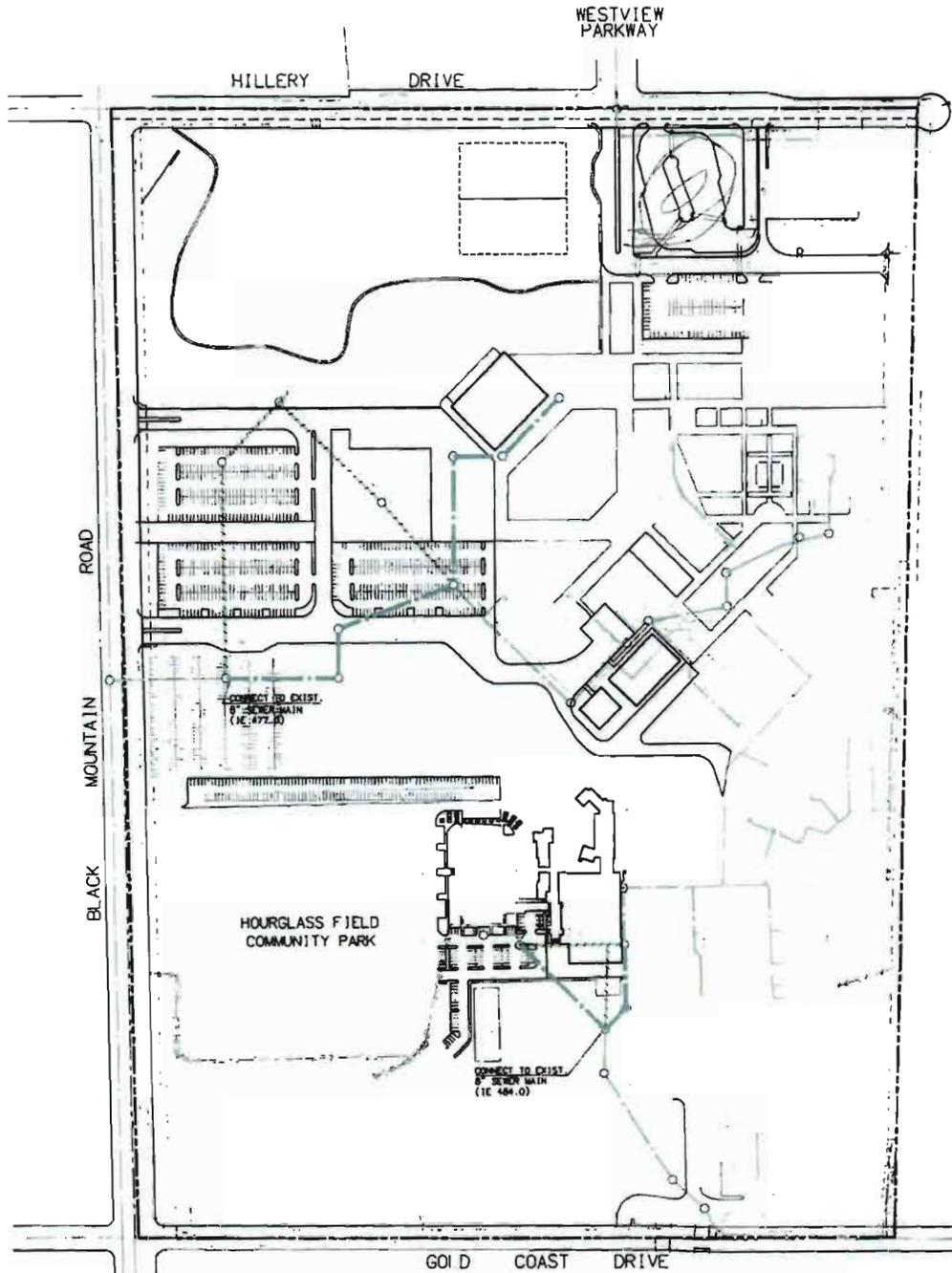
LEGEND:

- EXISTING WATER
- STOP FIRE HYDRANT
- EXIST FIRE HYDRANT

NOTES:

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.
2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.



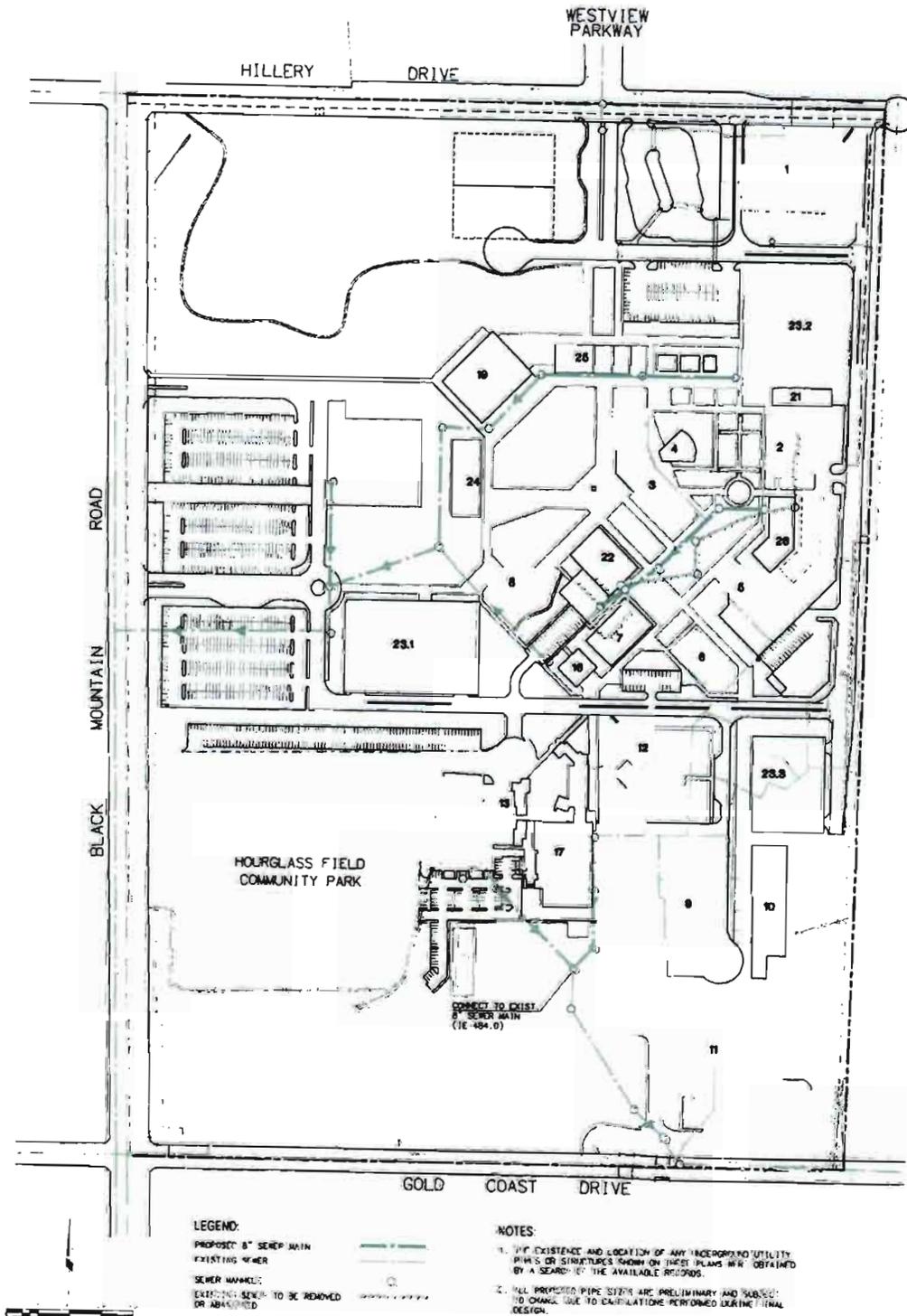


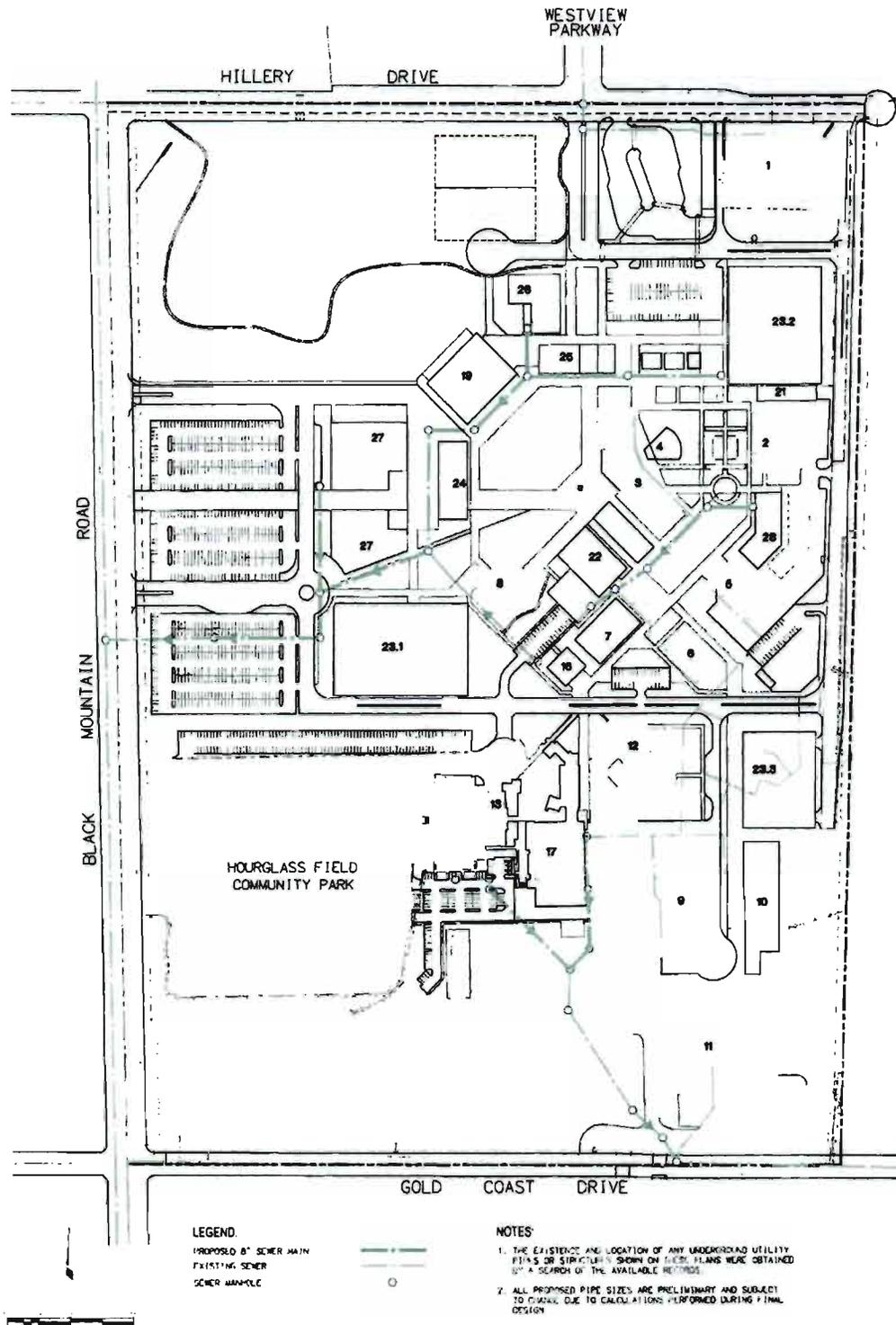
**LEGEND:**  
 PROPOSED 8" SEWER MAIN  
 EXISTING SEWER  
 SEWER MANHOLE  
 EXISTING SLURR TO BE REMOVED OR ABANDONED



**NOTES:**  
 1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.  
 2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.







**LEGEND**

- PROPOSED 8" SEWER MAIN
- EXISTING SEWER
- SEWER MANHOLE



**NOTES**

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY LINES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS.
2. ALL PROPOSED PIPE SIZES ARE PRELIMINARY AND SUBJECT TO CHANGE DUE TO CALCULATIONS PERFORMED DURING FINAL DESIGN.

## SCOPE OF WORK

The scope of work shall generally include all power, lighting, lighting controls, optional standby power, fire alarm, telephone, data network, and low voltage systems associated with the construction of new structures at the Miramar College located in San Diego, California.

## BASIS OF DESIGN

### 1. Codes, Standards and Regulations

- a. The facility will comply with the requirements of the 1999 Edition Uniform Building Code (UBC), 1999 Edition National Electrical Code (NEC), California State Administrative Code (Title 24), City of San Diego Municipal Code, Local Fire Department Regulations and all other jurisdictions having authority.
- b. The design, products, and installation shall comply with the following electrical industry standards:
  - Electronic Industries Association (EIA) Standard 568, 569, 607
  - Illumination Engineering Society of North America (IES) Lighting Standards
  - Institute of Electrical and Electronic Engineers (IEEE) Standards
  - National Electrical Manufacturers' Association (NEMA)
  - Insulated Power Cable Engineers' Association (IPCEA)
  - Certified Ballast Manufacturers' Association (CBMA)
  - Underwriters Laboratories, Inc. (UL)
  - National Fire Protection Association (NFPA)
  - National Electrical Code (NEC)
  - CAC Title 24 Energy Standards
  - City of San Diego Fire Department Regulations
  - City of San Diego Requirements
  - Air Pollution Control District (APCD)
  - American National Standards Institute (ANSI)
  - All other Authorities Having Jurisdiction (AHJ)
- c. Existing power utilities and distribution on site, that is to be retained, shall be protected in place and shall remain in operation unless specifically noted otherwise.

### 2. System Summary

- a. Power service entrance
- b. Power distribution
- c. Interior lighting
- d. Exterior lighting
- e. Lighting control
- f. Emergency lighting and power systems
- g. Structured wiring systems
- h. Telephone wiring systems
- i. Data wiring systems
- j. Fire alarm systems
- k. Security systems
- l. Audio/Video systems
- m. Green design

### 3. Power Service Entrance

- a. The main electrical service entrance primary 12kV feeders shall be from the SDG&E pole located at the northwest corner of the campus. The underground 12kV services shall be routed in below grade ductbanks, consisting of (4) 4" conduits, to pad-mounted transformers and SF6 switches adjacent to the buildings.
- b. The ductbank system is roughly composed of a north loop, central loop, and south loop.
- c. Ductbank conduit sizing allows for sectionalization of the campus into the (3) adjacent loops. The quantity of conduits in the ductbank is sufficient for the (3) loops and includes a spare conduit.
- d. A single main 12kV meter and disconnect is provided at this SDG&E service entrance.
- e. All metering switchgear is located indoors and is rated NEMA 1.

### 4. Power Distribution

- a. Main distribution boards are intended to serve HVAC, lighting, convenience, dedicated, and miscellaneous motor loads in each building.
- b. Power distribution to the central plant, through the ductbank system, may be increased as the central plant is expanded.



- c. Vertical distribution will consist of riser conduits to panelboards located on each floor.
- d. Digital metering is provided to monitor demand loads and power quality throughout the distribution system.
- e. All conductors, bussing, and transformer windings are copper, unless noted otherwise.
- f. All feeder and branch circuit wiring in interior concealed spaces shall be Type THW or THHN conductors in EMT conduit.
- g. HVAC fan loads and miscellaneous motor loads shall be served independently from other building systems and are estimated at 8 watts per SF.
- h. Window washing power will be provided at the roof.
- i. Furniture systems shall be fed through the floor (using fire-rated poke-throughs) or walls; no power poles shall be designed.
- j. Convenience power will be provided with a minimum of four receptacles per office and is estimated at 5 watts per SF.
- k. Lighting will be provided throughout the building and is estimated at 1.25 watts per SF.

**5. Interior lighting**

- a. Open Office Areas shall utilize indirect/direct low glare lighting fixtures with a spacing and density to supply appropriate light levels for the tasks being performed while minimizing watts per square foot. These fluorescent fixtures shall be equipped with energy efficient electronic ballasts and T5 or T8 lamps. Compact fluorescent lighting with electronic ballasts will be used in special areas. The color temperature of the lamps will be 3500K.
- b. Private offices shall utilize recessed 2' x 4' low-glare parabolic fluorescent fixtures. These fixtures shall be equipped with T8 lamps and energy efficient electronic ballasts. They will be configured to allow for in-board/out-board bi-level control to maximize potential energy savings while allowing for optimal user control. The color temperature of the lamps will be 3500K.
- c. All lighting shall be designed to exceed the latest California Title 24 requirements.

**6. Exterior lighting**

- a. Exterior lighting shall utilize high intensity discharge sources.
- b. Fixtures shall use optical systems and sources that are in compliance with local lighting ordinances.
- c. Light levels shall be in accordance with program documents and as recommended by the Illuminating Engineering Society of North America.
- d. All exterior fixtures shall be controlled by the facility lighting control system using a time-clock on/time-clock off/ photocell control strategy.

**7. Lighting control**

- a. Lighting control systems shall use a combination of control relay control panels (with timeclock and photocell functions) and local motion sensors (ultrasonic/infrared type). All lighting controls shall integrate directly to the building automation system (BAS).

**8. Emergency lighting and power systems**

- a. Code requirements
  - 1. Egress lighting will be provided as required by code in interior and exterior areas. The code-required alternate power source shall be batteries.
  - 2. No other code-required standby power systems are known at this time; however, if necessary, standby power shall be provided for any systems as designated by code.
- b. Optional systems
  - 1. If required, a standby diesel generator capable of providing all optional standby power requirements, as well as providing backup to the code-required battery systems used for egress lighting, shall be provided. Standby power generation shall have a minimum of eight (8) hours of fuel supply.
  - 2. Remote alarms and annunciation will be required and shall be transmitted to a central location designated by the Client.
- a. The following are typical areas and systems that require optional standby power:
  - i. Executive offices;
  - ii. Facilities management offices;
  - iii. Server Room;
  - iv. MC/IC facilities;
  - v. Telephone systems;
  - vi. Building automation systems;
  - vii. Building management and support systems;
  - viii. Video conferencing facility;
  - ix. Chillers, pumps, and fans required to support the above loads on a 24-hour 7-day basis.
  - x. Uninterruptible Power Supply systems (UPS) designed to support data processing, MC, IC and other critical loads.

**9. Structured Wiring (Proposed criteria only)**

- a. A new structured wiring system will be installed for this project. The system shall comply with ANSI/EIA/TIA (except as noted below), NFPA, and NEC requirements and shall consist of intrabuilding fiber optic backbone cabling, horizontal Cat 6 cabling, cross connects, racks, patch panels, wall outlets and other devices.



- b. The data backbone system will utilize multimode, fiber optic cables from the main crossconnect (MC) to each intermediate crossconnect (IC) as required. An IC will be provided for each floor such that the horizontal cable runs do not exceed 90 meters. The backbone cables will terminate on fiber optic patch panels installed in freestanding racks (7' X 19"). The horizontal Cat 6 cabling will run from each workstation outlet to data patch panels mounted in freestanding racks located in the IC.
- c. The telephone backbone system will consist of Cat 3, multipair riser cable run from the MC to each IC as required. These multipair cables will terminate on voice patch panels in both the MC and the IC. The horizontal Cat 3 cabling will run from the workstation outlet to the voice patch panels in the IC. A four-pair cross connect will be made from each station cable to the backbone system. This will result in each workstation having all four pairs extended all the way to the MC for final cross connect by SBC.
- d. ANSI/EIA/TIA 569 requires a 110 sq. ft. IC room for every 10,000 sq. ft. of gross floor space. This requirement is geared toward a multi tenant situation, where the actual occupancy is unknown. In general, the IC rooms will be approximately 100 sq. ft. in size, rectangular in shape and maintain an aspect ratio of no less than 3 to 4.
- e. Cable Runway will be used for wire management in the MC and IC rooms where freestanding racks are used.
- f. Conduit pathways will be provided between all IC's and the MC.
- g. All horizontal cabling will be plenum rated cable concealed in the ceiling and wall spaces
- h. All conduits, racks, equipment and other required items will be bonded together as well as grounded to the main grounding electrode in each building per ANSI/EIA/TIA 607.
- i. A typical tele/data outlet location will contain two RJ45, Cat 6, data jacks and two RJ11, Cat 3 voice jacks.

**10. Telephone Wiring System (Proposed criteria only)**

- a. The telephone system will be made up of dedicated fiber optic cables from SBC to the onsite telephone switch.
- b. The telephone backbone cabling will be Cat 3 multipair cable terminated on voice patch panels.
- c. The telephone horizontal cabling will be plenum rated, 4-pair, Cat 3 wiring, terminated on voice patch panels in the IC's and on RJ11 jacks at the workstation outlet.
- d. All required cross connects in the MC and IC rooms will be made by the telecommunications contractor.
- e. SBC will provide and install all incoming telephone lines at the MC and will establish a minimum point of entry (MPOE). They will also provide and install all equipment and panels relating to the circuit protection of each incoming line.

**11. Data Wiring System (Proposed criteria only)**

- a. Each workstation outlet will have two Cat 6 data jacks. The horizontal Cat 6 data cabling will run from each workstation outlet to data patch panels in the IC.
- b. In general, the horizontal wiring for both the telephone and data systems will be open wiring in the plenum ceiling spaces (no cable tray or conduit will be provided), while the backbone cabling will be run in conduit.

**12. Fire Alarm System**

- a. A new complete fire alarm system will be installed for this project. The fire alarm system shall comply with NFPA, NEC and ADA requirements and shall consist of manual pull stations, combination audio/visual alarms, strobes, water flow / lamper switch connections, and single station detectors. Heat detectors, smoke detectors and duct detectors will be provided as necessary. Audible devices will be installed as required. Interfaces to the elevators (elevator recall), sound systems, and other required systems shall be provided. A new, addressable, Class "B" fire alarm control panel will be provided and installed
- b. The entire fire alarm system is to be installed in raceway. The design of the fire alarm system will be coordinated with the local AHJ and the State Fire Marshal's Office. Approval for the design will be obtained and presented to the owner prior to procurement and installation.
- c. The fire alarm system shall be a Class "B" fully addressable, voice system.
- d. The fire alarm system will be completely interfaced to the other systems (i.e. lighting control, HVAC controls, security, etc.).
- e. Smoke detection shall be provided as required by the State Fire Marshal.
- f. Elevator recall and shunt trip activation to be provided.
- g. No hazardous chemicals will be stored inside of the building.
- h. No smoke control will be provided.

**13. Security System (Proposed criteria only)**

- a. A new and complete security system will be installed for this project. The security system shall comply with NFPA, NEC and ADA requirements and shall consist of electric door lock controllers (electric locks to be provided under the hardware specifications), proximity card readers, door contacts, glass break detectors, motion detectors, panic buttons, and other detection devices. Fixed surveillance cameras will be used at all exterior doors as well as the main computer room and other areas as identified by the owner. A new security control panel with central station communication will be provided and installed.
- b. The security system is to be installed with plenum rated cable in concealed areas and in raceway when exposed. Approval for the proposed system will be obtained from the owner prior to procurement and installation.



- c. The security system will be a Class "B" non-addressable, general perimeter protection system completely interfaced to the other systems (i.e. lighting control, HVAC controls, fire alarm, etc.).
- d. Remote panels will all report to one master remote monitor at the front reception desk.
- e. Digital storage, a 21" monitor, and the computer for the security system will reside at the front reception desk.
- f. The security system will be armed continuously.
- g. Bypass switches for selected doors will be provided at the front reception desk.
- h. The access and CCTV systems will be fully integrated with the security system.
- i. The IC rooms, MC room, and all exterior and stairwell doors will have card access control.
- j. The elevators will have access control for each floor. The car readers will be provided under this section and installed under the elevator section (including trolley cable).
- k. Except as noted, exit from protected spaces will be provided via request-to-exit motion sensors.
- l. Panic override hardware for all fire exit doors will be provided under a separate section. Use of this hardware will cause an alarm to be transmitted to the front desk and the central station.
- m. Cameras will be provided at all exterior doors.
- n. Protected doors will transmit an alarm should they be forced open (opened without the use of the card access system) or held open for longer than the allowed time. However, any or all of these doors may be bypassed from the system by activating switches at the front reception computer.

**14. Audio/Visual System (Proposed criteria only)**

- a. Provide cabling and network connectivity for owner furnished and installed (OFOI) tele/video conferencing units (TCU's), video projectors, monitors and other associated equipment. Provide and install motorized projection screens, sound systems and public address systems as follows:
  - b. In larger conference rooms (occupancy of more than 25 individuals) provide wiring and outlets for a ceiling mounted projector (OFOI), TCU (OFOI), a motorized projection screen, equipment and speakers for a sound system.
  - c. In mid-sized conference rooms (capacity of less than 25 but greater than 10), provide wiring and outlets for a TCU (OFOI) and a motorized projection screen.
  - d. The TCU's will have dedicated data lines provided back to the shared T1 lines.
  - e. Both RF video (CATV) and D15 type (XGA) wiring will be provided to each video projector location. The cables will end in a junction box located within the conference room on a flush mounted plate. The stainless steel plate will have a D15 and "F" type video connectors mounted on it for connection to a local computer, DVD, or DVR.
  - f. Data and power outlets will be located next to the wall plate described above.
  - g. The motorized projection screens will be flush mounted in the ceiling and have a wall plate type control.
  - h. 8" round, flush mounted ceiling speakers will be used as required for larger rooms.
  - i. The OFOI video projectors will be fixed mounted below the ceiling.
  - j. Wireless assisted listening devices will be provided and installed by the owner as needed.

**15. Green Design**

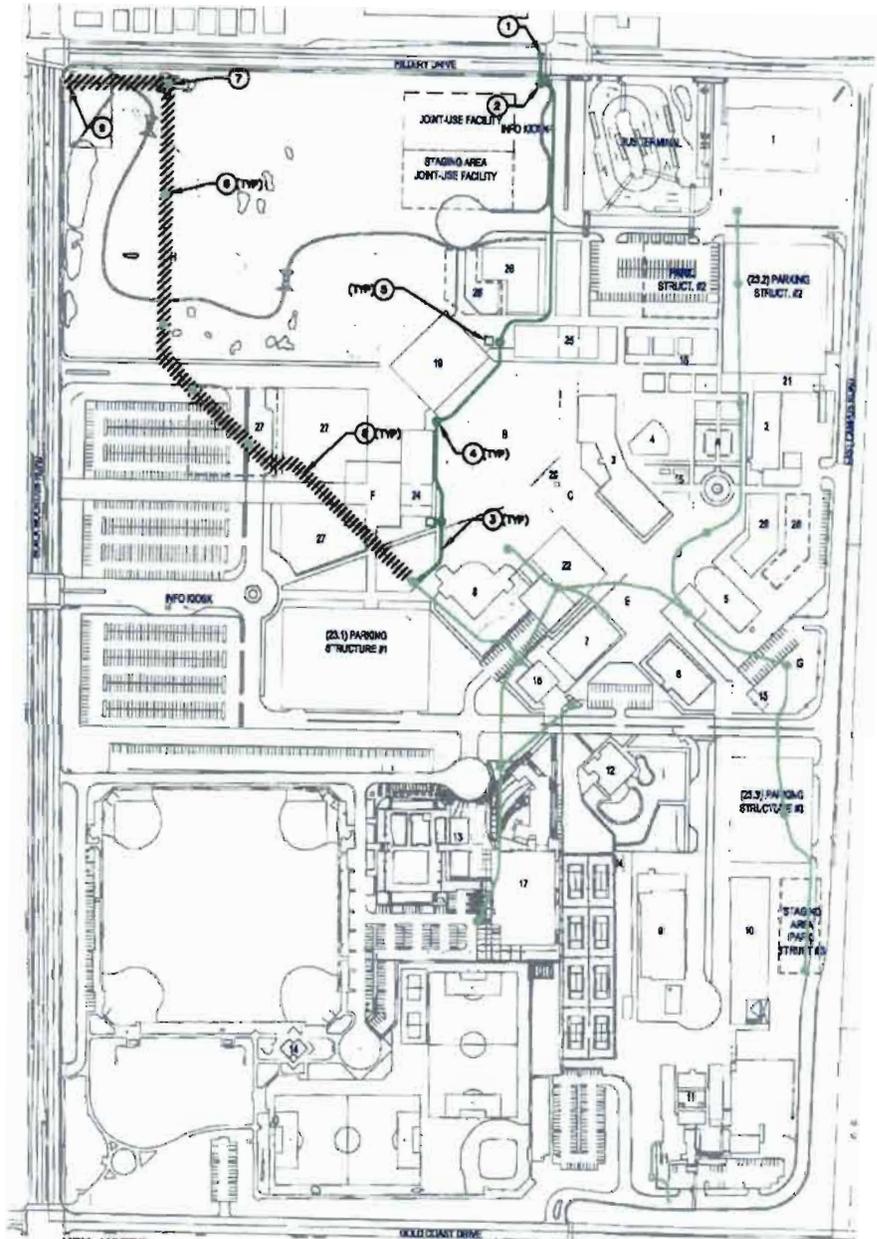
The electrical system will include the following "Green Design" systems, products, and features:

- a. Fluorescent lamps are either T5 or T8, energy efficient type
- b. Compact Fluorescent lamps are used in lieu of incandescent lamps
- c. LED exit signs are specified
- d. Task lighting is specified as part of the systems furniture
- e. Central lighting relay control panels utilizing timeclock and/or photocontrol is specified
- f. Motion sensors are specified for local control in small offices and equipment rooms;
- g. Electronic ballasts are specified
- h. Tandem wiring is specified for recessed 2'x4' fluorescent fixtures
- i. Indirect lighting is used for ambient illumination of open office spaces
- j. Selective switching is specified to isolate day lit areas
- k. High intensity discharge (HID) lamps, primarily low pressure sodium, are used for parking and area lighting on the exterior
- l. Exterior lighting is sharp cut-off, low glare, design
- m. All lighting is designed to comply with latest IESNA recommendations
- n. All lighting is designed to exceed Title 24 requirements

**CONCLUSION**

The electrical system shall comply with all San Diego Gas & Electric requirements and with the client program needs. The electrical system shall be flexible and of sufficient capacity to provide ongoing service to the proposed buildings to be built on the campus. The system shall be energy-efficient and of the most current available technology while maintaining a cost-effective initial construction. Power quality and reliability shall be preserved in critical load areas. The electrical system shall comply with all known and applicable codes and standards.





**KEY NOTES:**

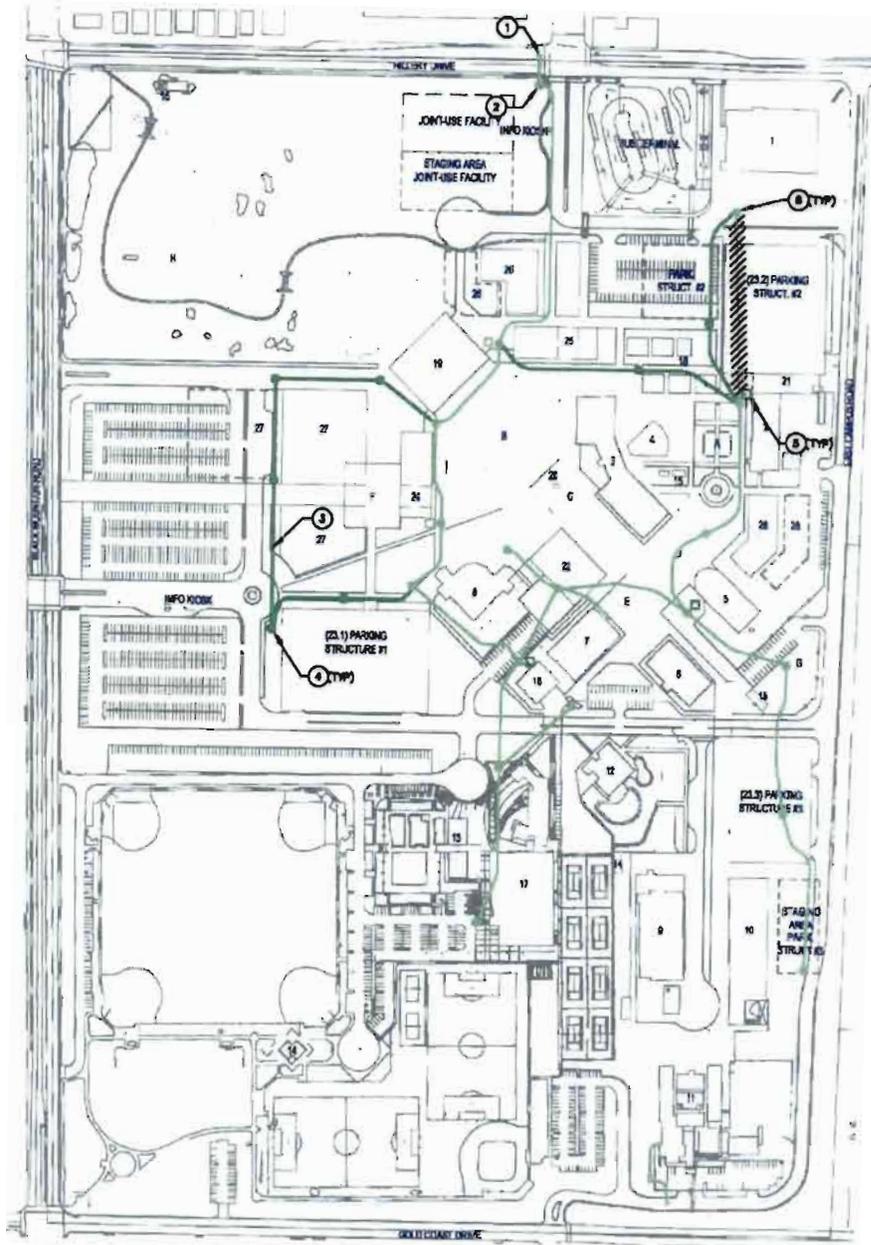
- ① NEW 500K SERVICE ENTRANCE POINT.
- ② NEW 1200A 18KV MAIN SERVICE SWITCHGEAR.
- ③ NEW (4)" CONDUIT ONLY DUCT BANK SYSTEM.
- ④ NEW ELECTRICAL MANHOLE.
- ⑤ NEW GAS SWITCH.
- ⑥ EXISTING ELECTRICAL MANHOLE.
- ⑦ EXISTING MAIN SERVICE SWITCHGEAR TO BE REPLACED WITH NEW.
- ⑧ EXISTING ELECTRICAL DUCTBANK SYSTEM.
- ⑨ EXISTING 500K SERVICE ENTRANCE POINT.

**LEGEND:**

- EXISTING CONDUIT.
- NEW CONDUIT PHASE I.
- EXISTING ELECTRICAL MANHOLE.
- NEW ELECTRICAL MANHOLE.
- NEW ABOVE GRADE GAS SWITCH.
- EXISTING UTILITY TRANSFORMER TO REMAIN.
- ▨ DEMOLITION PHASE I.



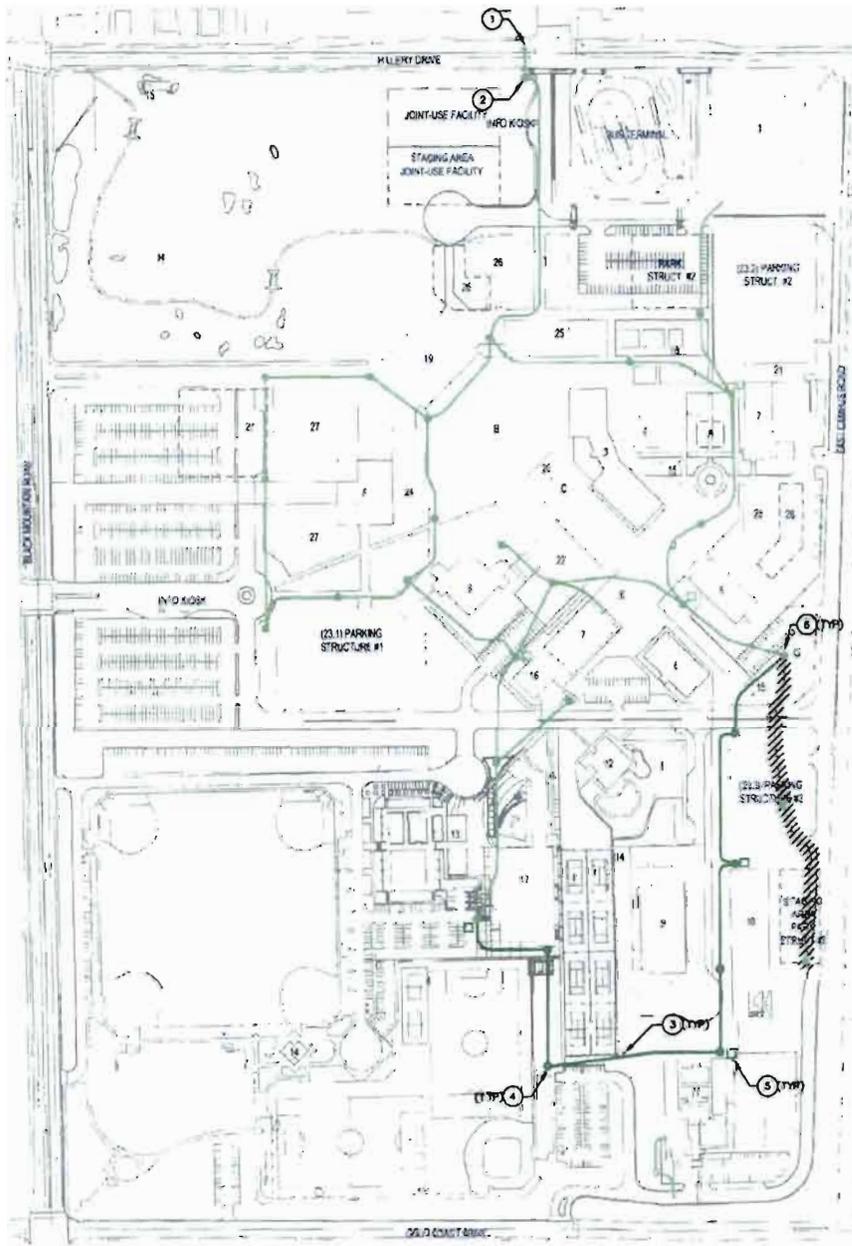
**MICHAEL WALL ENGINEERING**  
 850 218 1100  
 400 W. 10TH ST.  
 4TH FLOOR  
 DENVER, CO 80202



- KEY NOTES:**
- ① 800V SERVICE ENTRANCE POINT.
  - ② 1200A 10KV MAIN SERVICE SWITCHGEAR.
  - ③ NEW (4X4) CONDUIT ONLY DUCT BANK SYSTEM.
  - ④ NEW ELECTRICAL MANHOLE.
  - ⑤ NEW GAS SWITCH.
  - ⑥ EXISTING ELECTRICAL MANHOLE.

- LEGEND:**
- EXISTING CONDUIT.
  - NEW CONDUIT PHASE II.
  - EXISTING ELECTRICAL MANHOLE.
  - NEW ELECTRICAL MANHOLE.
  - EXISTING ABOVE GRADE GAS SWITCH.
  - NEW ABOVE GRADE GAS SWITCH.
  - ⊙ EXISTING UTILITY TRANSFORMER TO REMAIN.
  - ▨ DEMOLITION PHASE I.





**KEY NOTES:**

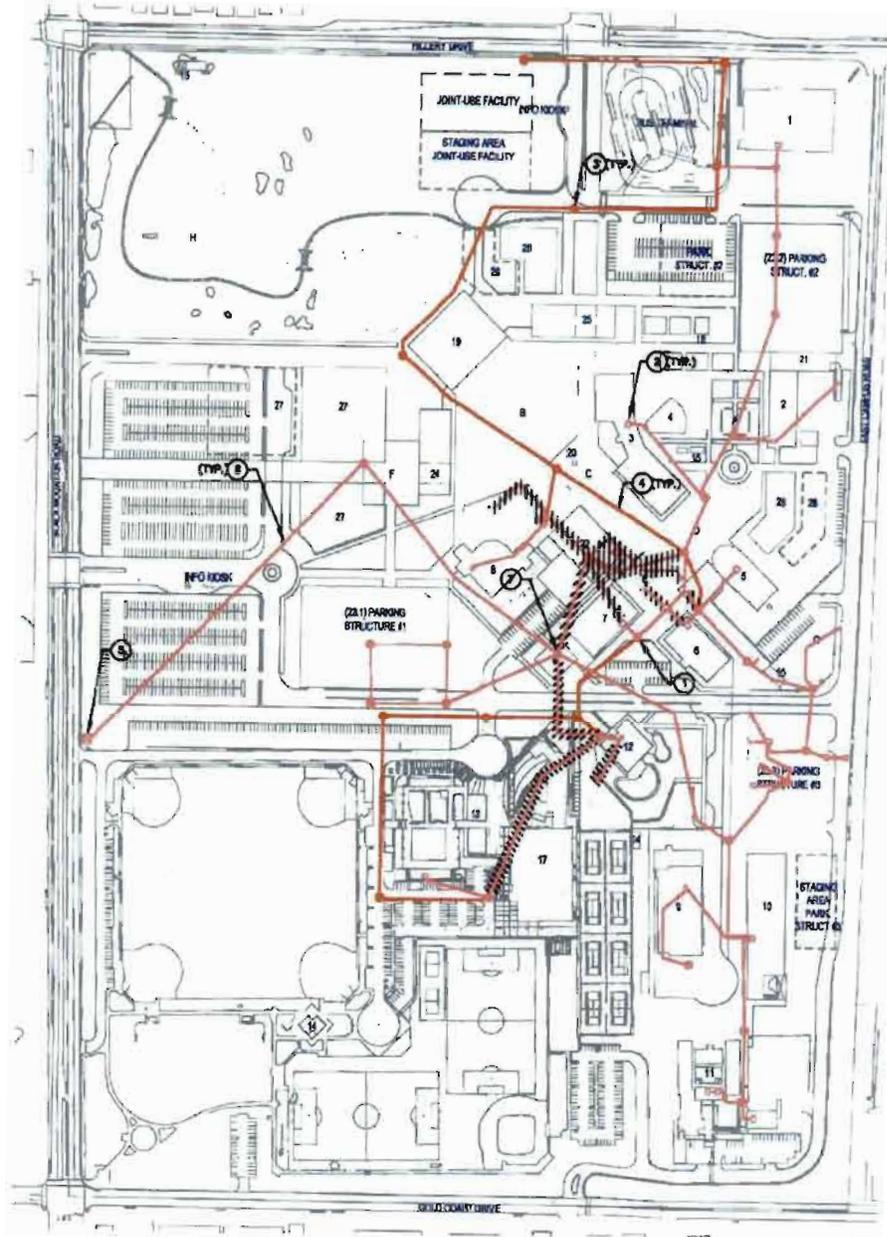
- ① 300A SERVICE ENTRANCE POINT.
- ② 1200A 15KV MAIN SERVICE SWITCHGEAR.
- ③ NEW (4)" CONDUIT ONLY DUCT BANK SYSTEM.
- ④ NEW ELECTRICAL MANHOLE.
- ⑤ NEW GAS SWITCH.
- ⑥ EXISTING ELECTRICAL MANHOLE.

**LEGEND:**

- EXISTING CONDUIT.
- NEW CONDUIT PHASE III.
- EXISTING ELECTRICAL MANHOLE.
- NEW ELECTRICAL MANHOLE.
- EXISTING ABOVE GRADE GAS SWITCH.
- NEW ABOVE GRADE GAS SWITCH.
- EXISTING UTILITY TRANSFORMER TO REMAIN.
- ////// DEMOLITION PHASE II.



**MICHAEL WALL ENGINEERING**  
 800 S. 10th Street  
 Suite 100  
 Lincoln, NE 68502  
 Phone: (402) 441-1111  
 Fax: (402) 441-1112



**KEY NOTES:**

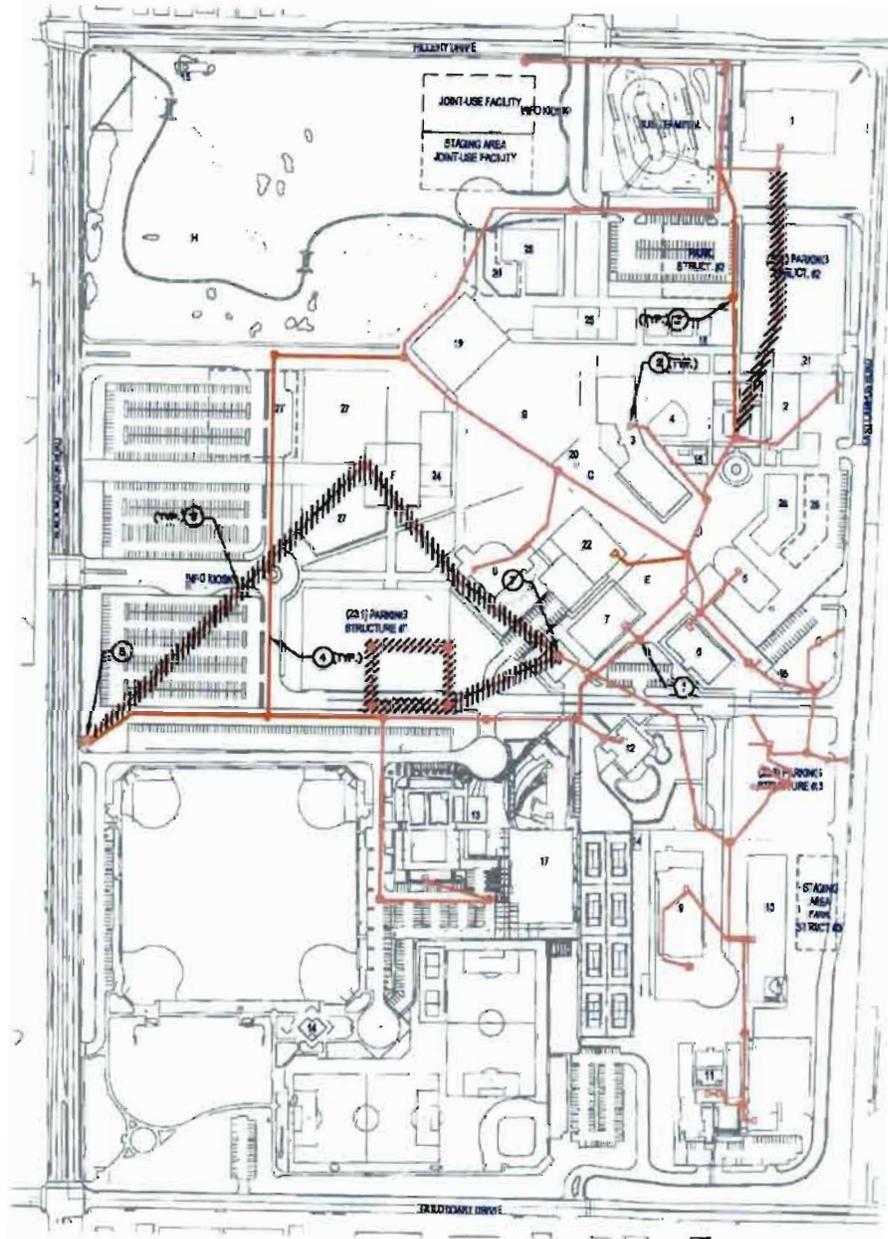
- ① NEW RELOCATED SBC TELEPHONE SERVICE ENTRANCE.
- ② EXISTING TELEPHONE SERVICE TO REMAIN.
- ③ NEW TELEPHONE MANHOLE.
- ④ NEW (4)" CONDUIT ONLY DUCT BANK SYSTEM.
- ⑤ EXISTING SBC TELEPHONE SERVICE ENTRANCE.
- ⑥ EXISTING TELEPHONE DUCTBANK SYSTEM.
- ⑦ EXISTING MAIN TELEPHONE SERVICE TO BE RELOCATED.

**LEGEND:**

- EXISTING CONDUIT.
- NEW CONDUIT, PHASE I.
- EXISTING TELEPHONE ROOM.
- EXISTING TELEPHONE MANHOLE.
- NEW TELEPHONE MANHOLE.
- ////// DEMOLITION PHASE I.



**MORSE WALL ENGINEERING**  
 814-328-0000  
 855-613-0140  
 www.morsetw.com  
 2400 Foxglove Valley Blvd  
 San Diego, CA 92108  
 10/16/16/CD/04/000000



**KEY NOTES:**

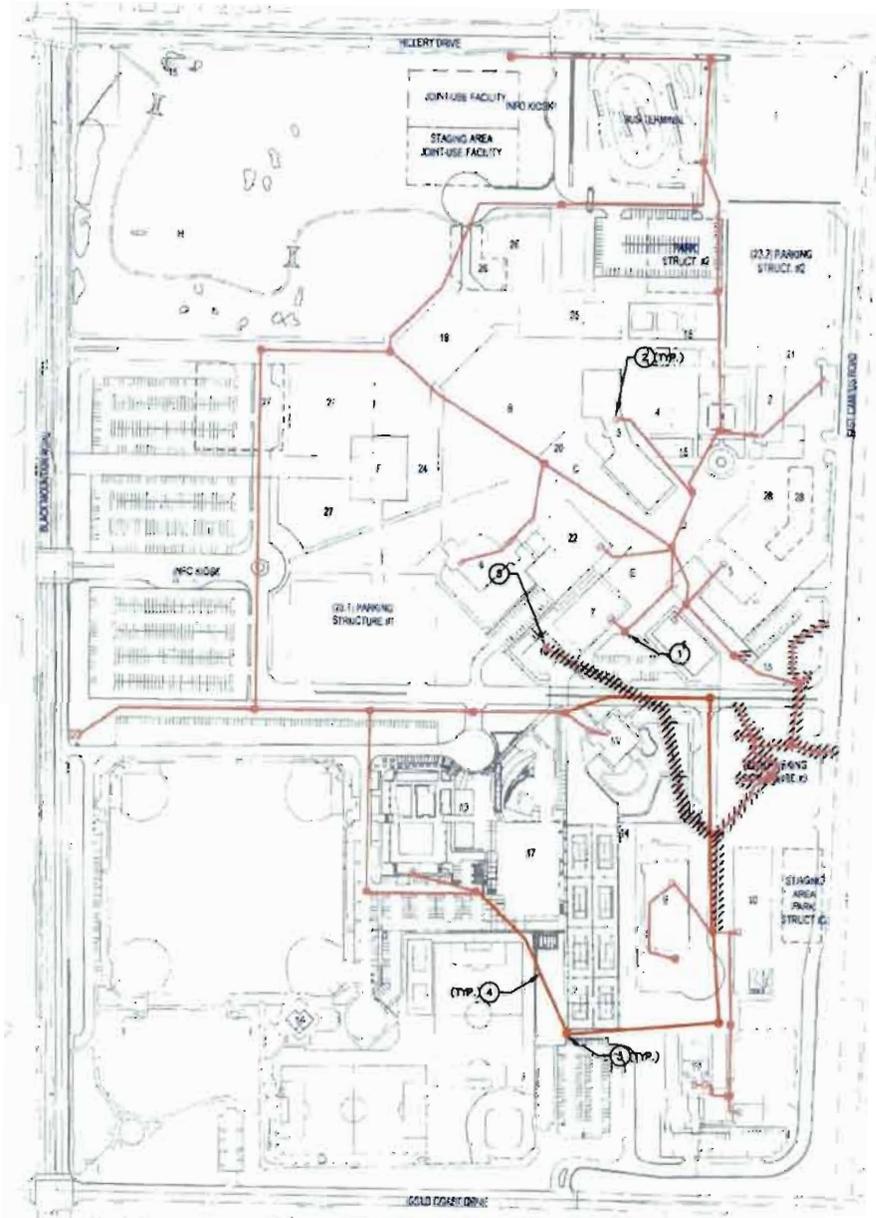
- ① 300 TELEPHONE SERVICE ENTRANCE.
- ② EXISTING TELEPHONE SERVICE TO REMAIN.
- ③ NEW TELEPHONE MANHOLE.
- ④ NEW 4" CONDUIT ONLY DUCT BANK SYSTEM.
- ⑤ EXISTING 300 TELEPHONE SERVICE ENTRANCE.
- ⑥ EXISTING TELEPHONE DUCTBANK SYSTEM.
- ⑦ EXISTING MARK TELEPHONE SERVICE TO BE RELOCATED.

**LEGEND:**

- EXISTING CONDUIT.
- NEW CONDUIT, PHASE I.
- EXISTING TELEPHONE ROOM.
- EXISTING TELEPHONE MANHOLE.
- NEW TELEPHONE ROOM.
- NEW TELEPHONE MANHOLE.
- /// DEMOLITION PHASE I.



**Michael Baker Engineering**  
 800.521.6200  
 10000 Woodloch Forest Drive  
 Suite 1000  
 Houston, Texas 77055  
 www.michaelbaker.com



**KEY NOTES:**

- ① SIG TELEPHONE SERVICE ENTRANCE.
- ② EXISTING TELEPHONE SERVICE TO REMAIN.
- ③ NEW TELEPHONE MANHOLE.
- ④ NEW (4)" CONDUIT ONLY DUCT BANK SYSTEM
- ⑤ EXISTING MAIN TELEPHONE SERVICE TO BE RELOCATED.

**LEGEND:**

- EXISTING CONDUIT.
- NEW CONDUIT, PHASE III.
- EXISTING TELEPHONE ROOM.
- EXISTING TELEPHONE MANHOLE.
- NEW TELEPHONE MANHOLE.
- ////// DEMOLITION PHASE II.



**MICHAEL WALL ENGINEERING**  
314-938-1600  
274-622-8800 (fax)  
Newport, Rhode Island  
1000 State Street, Suite 200  
Newport, Rhode Island 02841

## OVERVIEW

### General

The purpose of this report/study is to evaluate the existing heating and cooling production system (central plant) and site infrastructure to determine what upgrades and modifications are required to support the Architectural Master Plan (AMP). The AMP consists of the addition of several building and support structures throughout the expanded campus which will be constructed in phases over the course of a 10 year period. Keeping the construction time period in mind, the mechanical master plan is conceptual and its purpose is to serve as a general "road map". Given this - minor deviations are expected in terms of exact piping and equipment sizes and locations.

The underlying goal of the campus' mechanical master plan is to move away from packaged cooling/heating equipment and individual building chillers/boilers and shift towards a central plant heating/cooling concept. Among other things, the central plant cooling/heating concept not only reduces overall equipment capital cost by allowing for diversity factors but increases operating efficiencies and equipment redundancy while reducing general maintenance. However a detailed discussion outlining the benefits of the central plant concept is beyond the scope of this exercise. With the above in mind the mechanical master plans aims to provide a means to expand the existing central plant and modify/increase the site piping to provide cooling and heating as the new buildings become occupied. However based on certain physical locations, operating conditions and cooling/heating requirements, not all buildings will be connected to the central plant. The following tables (Table 1 "Existing and Future Heating Hot Water Loads" and Table 2 "Existing and Future Chilled Water Loads") list the buildings which will be connected to the central plant as well as the phase and construction sequence.

In determining the building loads, the tables listed above use industry standards for determining building cooling/heating loads on a square foot basis and use building and campus diversity factors in order to project the future central plant and utility requirements. As more detailed information becomes available during the development and construction of the buildings, the load tables should be adjusted accordingly.

### Design Guidelines

In order to maintain a consistent campus mechanical design methodology and to have the central plant operate efficiently a few key design guidelines must be adhered to.

**Chilled Water Temperatures** -The central plant produces 42 degree F chilled water and operates with a temperature differential between the chilled water supply and chilled water return of 12 degrees F. Building cooling coils/equipment should be selected with this in mind.

**Heating Hot Water Temperatures** -The central plant produces 180 degree F heating hot water and operates with a temperature differential between the heating hot water supply and heating hot water return of 30degrees F. Building heating coils/equipment should be selected with this in mind.

**Control Valves** - The chilled water and heating hot water systems are designed for variable flow. Two-way control valves should be used to regulate flow for heating/cooling coils.

This report does not attempt to set guidelines for individual building operating parameters. Design values such as interior and exterior temperature and humidity, interior occupancy loading and subsequent ventilation rates, etc should be evaluated during detailed building design. Additionally materials of construction and equipment/system types should be selected based on building usage.

## EXISTING CONDITIONS

### Central Plant

The existing central plant (Building U-100) currently produces and distributes chilled water and heating hot water for several existing campus buildings and has the ability to provide cooling for future buildings but has limited capacity to provide heating for future buildings. The chilled water system is a hybrid system consisting of one electric chiller and one absorption chiller which is driven by heating hot water produced from a gas powered generator. The chilled water system is installed and operates in a primary/secondary pumping/piping arrangement and can produce 600 tons of cooling and distribute 1,200 gallons per minute of chilled water. The secondary chilled water pumps and piping serve both the north and south campuses. The heating hot water system is installed in a primary/secondary pumping/piping arrangement and has a capacity of 5,800 MBH. A heat exchanger connected to the generator hot water loop preheats campus heating hot water before entering the boilers. The north and south campuses each have dedicated secondary heating hot water pumps and piping.



The heating system in its condition (March 2005) is slightly undersized for peak loads. The total heating load is slightly greater than the total boiler capacity and required heating hot water flow from the north campus is more than the capacity of the north campus heating hot water pumps. The south campus pumps are new and sized for the future load.

Before the final build-out of the campus the limits of the central plant will have to be increased to accommodate the campus cooling and heating loads.

#### **Cogeneration System**

A 555 kW cogeneration system operates in parallel to the utility, SDG&E, and is designed to operate 24 hours a day, seven days a week. The system is not designed for emergency power or back up power if the utility is down. The Caterpillar engine based unit burns natural gas, generates electricity and the waste heat is reclaimed for heating hot water and charging the absorption chiller. The electrical systems, dedicated natural gas service and heat recovery hot water pump and piping systems have been sized for expansion to accommodate an identical unit.

#### **Site Piping**

##### *Chilled Water / Heating Hot Water*

Existing service piping is directly buried and routed individually to campus buildings as illustrated in the accompanying drawings. Two of the five buildings currently connected to the central plant have tertiary, building pumps hydraulically isolating them from the central plant while the remaining buildings have distribution piping directly connected from the central plant to heat transfer equipment. There is a mixture of two and three way control valves within the campus.

##### *Gas Piping*

Medium pressure gas enters the site at two different locations and serves both the north and south campuses. A dedicated 60 psig, high pressure gas line enters the site at black mountain road and serves a cogeneration unit at the central plant.

#### **Existing and Future Loads**

Tables 1 and 2 consolidate the existing and future campus loads and are organized in conjunction with the campus construction periods (phases) as well as individual building construction sequences. The tables are a guideline to be used to help make decisions concerning central plant heating and cooling upgrades. Actions required to take place within each construction phase are listing in the far right hand column.

## **PHASE ONE**

#### **Central Plant**

##### *Heating Hot Water*

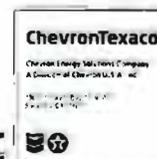
All modifications to the heating hot water system will need to take place during phase one, but can be divided into sub phases depending on the specific building construction sequence.

In or around the time Building 17 becomes occupied and operational, the heating hot water production system (boilers) will begin to fall short of capacity. Based on table 1 data, the heating hot water adjusted campus load will rise to above 7,000 MBH. The limits of the central plant will need to be expanded to accommodate the installation of new 6,000 MBH boiler and primary circulation pump. No modifications to the south distribution pumps will be required.

In or around the time Building 19 becomes occupied and operational, the heating hot water distribution system (north distribution pumps) will begin to fall short of capacity as they are currently strained. The existing 1,800 MBH boiler and north distribution pumps will need to be removed. New north variable speed, distribution pumps sized to accommodate the requirements for the entire campus build out will be installed in the location of the removed 1,800 MBH boiler. During the installation of the new distribution pumps a new 6,000 MBH boiler should be installed to complete the build-out of the heating hot water system. The installation of the new distribution pumps will require piping modifications within the central plant and the connection of new site piping to the existing system. New differential pressure sensors will need to be added at the site to control distribution pump speed.

##### *Chilled Water*

The installation of one (1) new 420 ton chiller and associated cooling tower will be required before the end of phase 1. The existing chilled water and condenser water pumping system have reserve capacity to handle the added demand, but redundancy will be reduced. Pipe sizes within the central plant are adequate for the added demand, but minor modifications will be required to connect new distribution piping from the site to the central plant piping. New differential pressure sensors will need to be added at the site to control distribution pump speed.



### Site Piping/Work

#### *Chilled Water / Heating Hot Water*

New direct buried chilled water and heating hot water piping adequately sized to accommodate flow rates required for the complete campus building out will be installed from the central plant to Building 19. Branch lines terminated with isolation valves accessed through valve boxes will be provided at each future building location for future connection. Branch piping will be brought close to individual buildings to insure landscaping will not be disrupted during future connection. The existing piping serving existing buildings will remain in service during the installation of the new piping and will be abandoned in place after the existing buildings are connected to the new distribution piping.

The use and value of chilled water / heating hot water tertiary pumps and ancillary equipment at Building 8 and Building 6 should be evaluated and addressed. Given the location of these buildings with respect to the central plant and the location of Building 19 with respect to the central plant, thought should be given to removing this equipment and directly connecting each building's heat transfer equipment to the central plant piping. Additionally, the removal of all three-way control valves and their replacement with two-way control valves should be evaluated and addressed. The three way control valves do not give the central plant pumping system the full value of campus diversity and can cause it to operate in-efficiently.

#### *Gas*

New direct buried medium pressure gas will be intercepted at the central plant and installed to building 19.

## PHASE TWO

### Central Plant

#### *Heating Hot Water*

No upgrades required.

#### *Chilled Water*

A major overhaul of the chilled water system will be required during phase two. A new chiller will need to be installed in the space made available from the extension of the central plant walls. A new cooling tower will need to be installed in the cooling tower yard. The existing cooling towers will need to be retrofitted and re-positioned to accommodate this addition. The majority of the main piping within the central plant will have to be removed and replaced with larger pipe. Branch piping to equipment including pumps and trim will likely be satisfactory for reuse.

### Cogeneration System

During development of Building 22, the opportunity to add another 555 kW cogeneration unit should be investigated. At this point in the campus expansion, it is estimated that the electrical load and the thermal loads could warrant the analysis effort. Other influential factors such as commodity price, rate structures, incentives and emission regulations, to name a few, should be considered.

### Site Piping

The existing chilled water and heating hot water piping serving Building 8 is located under the proposed future location of Building 22. This piping will have to be removed. New branch piping will need to be connected to the main distribution piping installed in phase one, routed around the limits of building 22 and reconnected to the existing piping serving Building 8. Other buildings being constructed will need to be connected to the main distribution piping installed during phase one.

## PHASE THREE

### Central Plant

#### *Heating Hot Water*

No upgrades required.

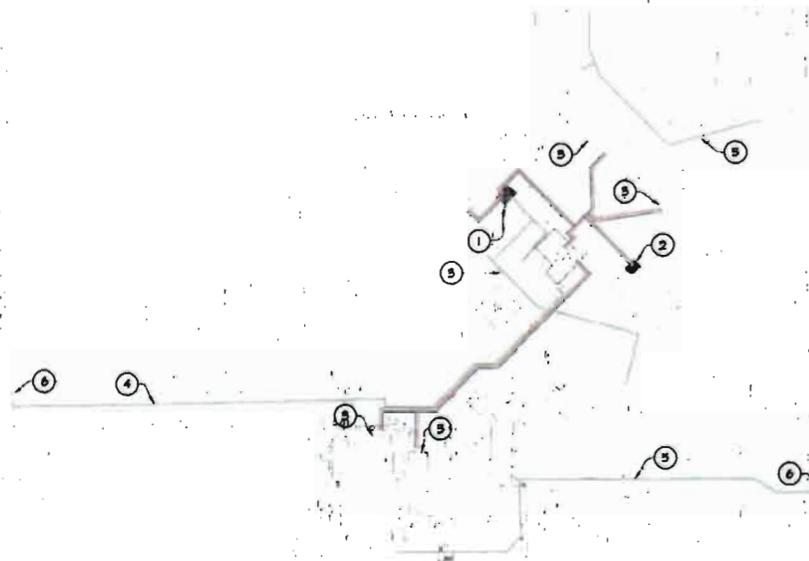
#### *Chilled Water*

No upgrades required.

### Site Piping

Buildings being constructed will need to be connected to the main distribution piping installed during phase one.





**SITE PIPING**

- ① EXISTING EMERGENCY CHILLER AND BOILER HOUSED IN EQUIPMENT YARD WITH TERTIARY CHILLED WATER AND HEATING HOT WATER PUMPS.
- ② EXISTING BUILDING MECHANICAL ROOM WITH TERTIARY CHILLED WATER AND HEATING HOT WATER PUMPS
- ③ BUILDING HAS CHILLED WATER AND/OR HEATING HOT WATER PIPED DIRECTLY TO COILS/HEAT EXCHANGERS
- ④ EXISTING DEDICATED 6" PSIG 4"PG FROM STREET TO COGENERATION UNIT.
- ⑤ EXISTING PPG
- ⑥ EXISTING GAS METER TO REMAIN.

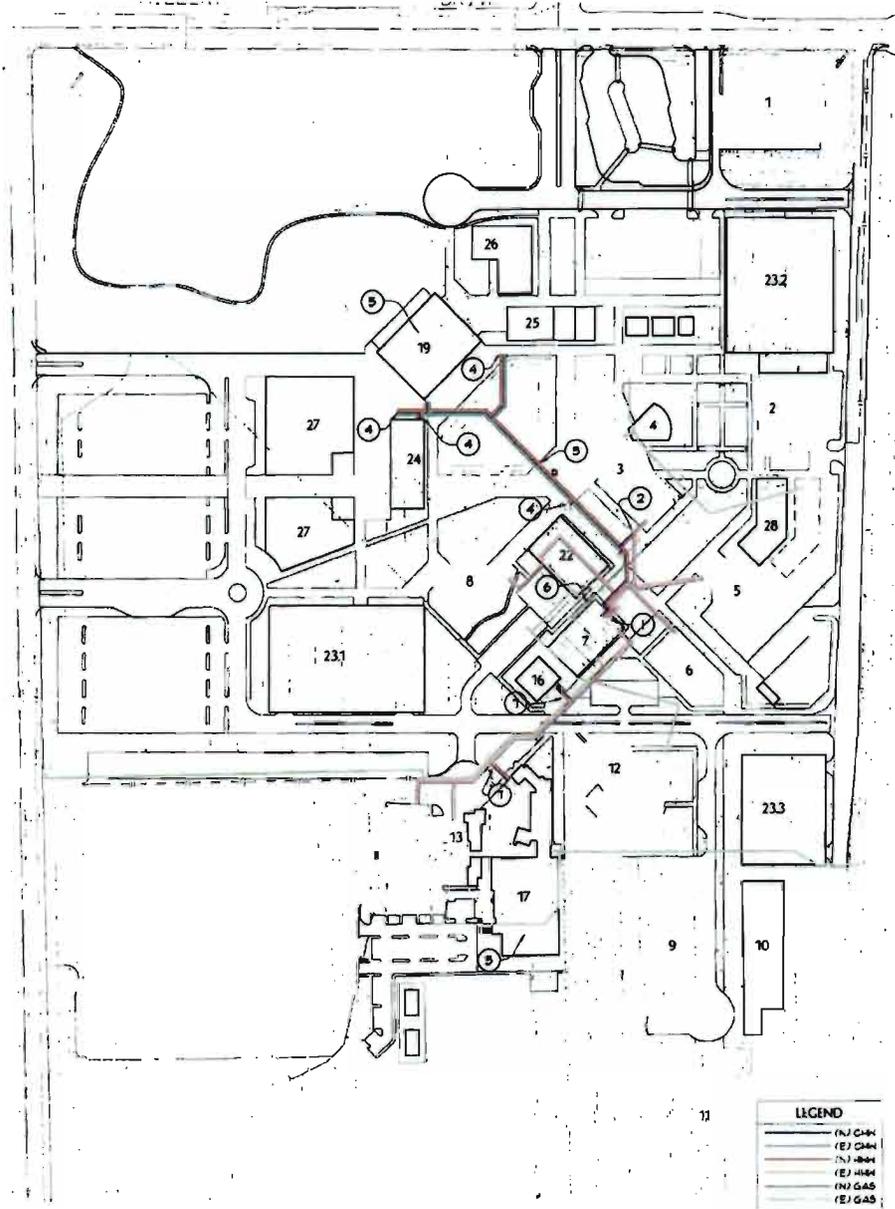


LEGEND	
(E) 0.344	
(E) 1.884	
(E) 0.445	

**ChevronTexaco**

Chevron Energy Services Company  
A Division of Chevron U.S.A. Inc.  
100 OFFSHORE DRIVE  
FARMERSVILLE, TEXAS 77834





**SITE PIPING**

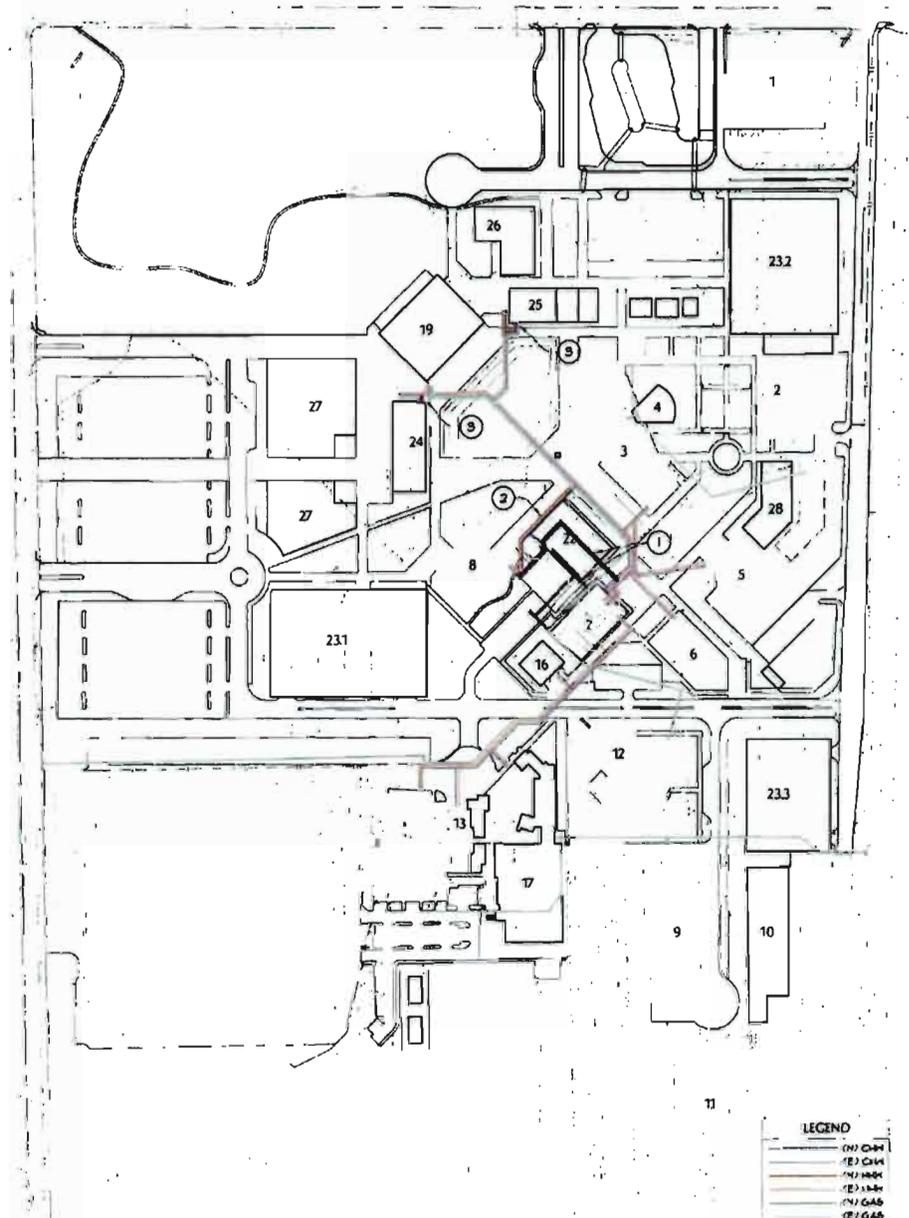
- ① NEW 14" CHILLED WATER AND 8" HEATING HOT WATER PIPING FROM CENTRAL PLANT. EXISTING 10" CHILLED WATER AND 5" HEATING HOT WATER PIPING TO REMAIN
- ② CONNECT CHILLED WATER AND HEATING HOT WATER SERVING BUILDINGS 3, 5 + 6 TO NEW PIPING
- ③ NEW CHILLED WATER, HEATING HOT WATER AND GAS TO BUILDING 15
- ④ PROVIDE BRANCH STUB-OUT PIPING AND VALVE WITH VALVE BOX FOR CONNECTION TO FUTURE BUILDING
- ⑤ PROVIDE NEW DIFFERENTIAL PRESSURE TRANSMITTER AT BUILDING 19 ACROSS FURTEST AIR HANDLING UNIT FOR CONTROL OF DISTRIBUTION PUMPS IN CENTRAL PLANT
- ⑥ POINT OF CONNECTION TO EXISTING HFG
- ⑦ NEW PIPING FROM EXISTING VALVE BOX TO BUILDING CONNECTIONS



LEGEND	
(Solid line)	(N) CHW
(Dashed line)	(E) CHW
(Dotted line)	(N) HHW
(Dash-dot line)	(E) HHW
(Thin solid line)	(N) GAS
(Thin dashed line)	(E) GAS

**ChevronTexaco**  
Chevron Energy Services Company  
A Division of Chevron U.S.A. Inc.  
11000 Gateway Blvd., Suite 200  
Houston, TX 77036





**LEGEND**

(Red line)	(N) CH4
(Blue line)	(E) CH4
(Green line)	(N) H2O
(Orange line)	(E) H2O
(Purple line)	(N) GAS
(Yellow line)	(E) GAS

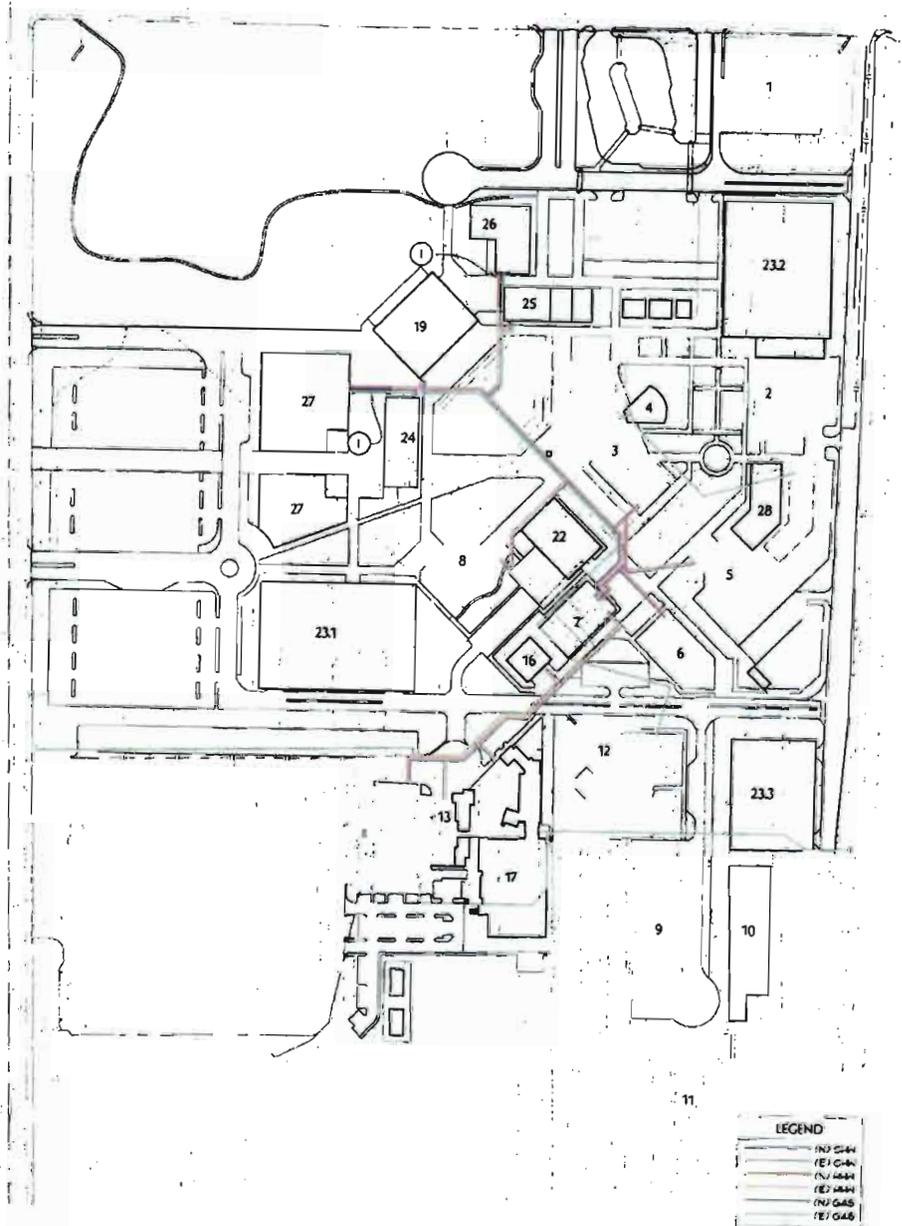


**SITE PIPING**

- ① REMOVE DIRECT BURIED CHANNAH PIPING FOR CONSTRUCTION OF BUILDING 22
- ② NEW CHILLED WATER/HEATING HOT WATER PIPING AROUND LIMITS OF BUILDING 22  
CONNECT TO EXISTING DIRECT BURIED PIPING SERVING BUILDING 8
- ③ NEW PIPING TO BUILDING CONNECTIONS

**ChevronTexaco**  
 A Division of Energy Services Company  
 A Division of Chevron U.S.A. Inc.  
 1500 Green Bay Avenue  
 Houston, TX 77002





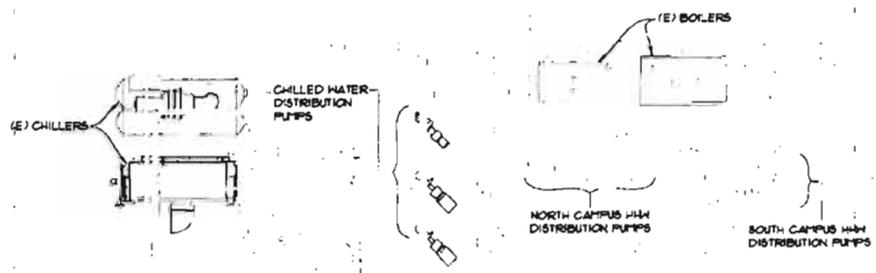
**SEE PIPING**  
① NEW PIPING TO BUILDING CONNECTIONS



LEGEND	
(Symbol: Solid line)	1\"/>
(Symbol: Dashed line)	1\"/>
(Symbol: Dotted line)	1\"/>
(Symbol: Long dashed line)	1\"/>
(Symbol: Dash-dot line)	1\"/>
(Symbol: Dotted line)	1\"/>

**ChevronTexaco**  
Chevron Energy Solutions Company  
A Division of Chevron U.S.A. Inc.  
1001 Lakeside Drive, Suite 200  
Houston, Texas 77016



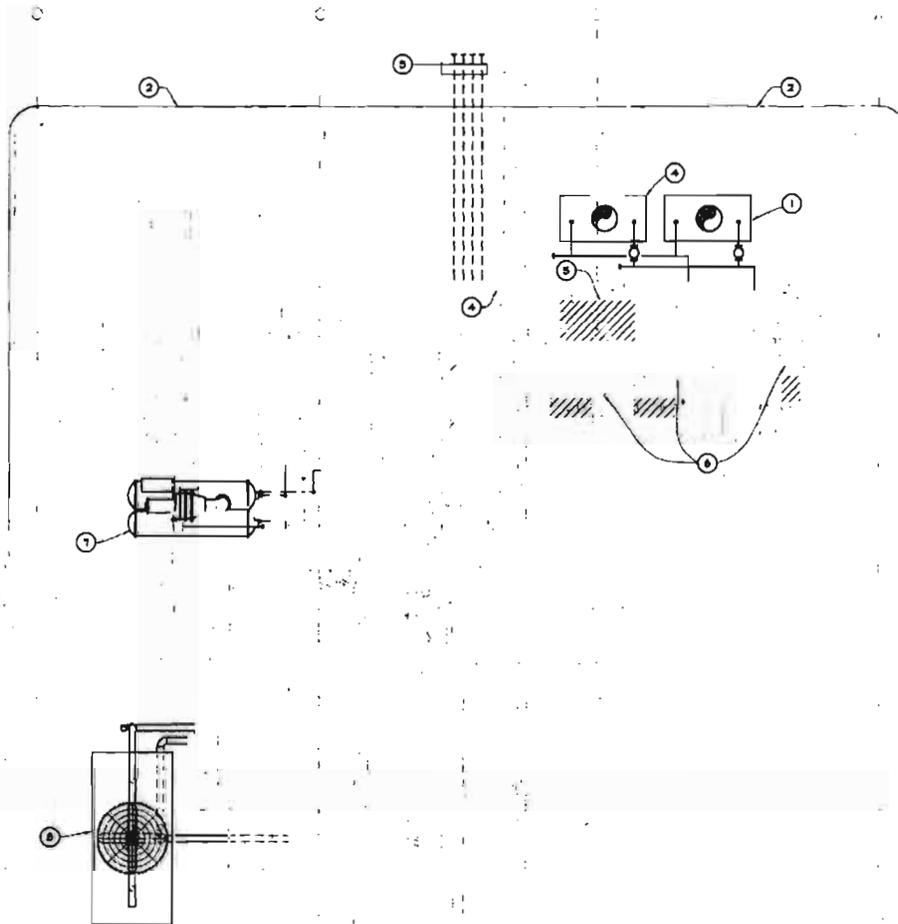


CENTRAL PLANT



**ChevronTexaco**  
Chevron Energy Services Company  
A Division of Chevron U.S.A. Inc.  
1401 Broadway, Suite 1400  
Houston, TX 77002





**CENTRAL PLANT**

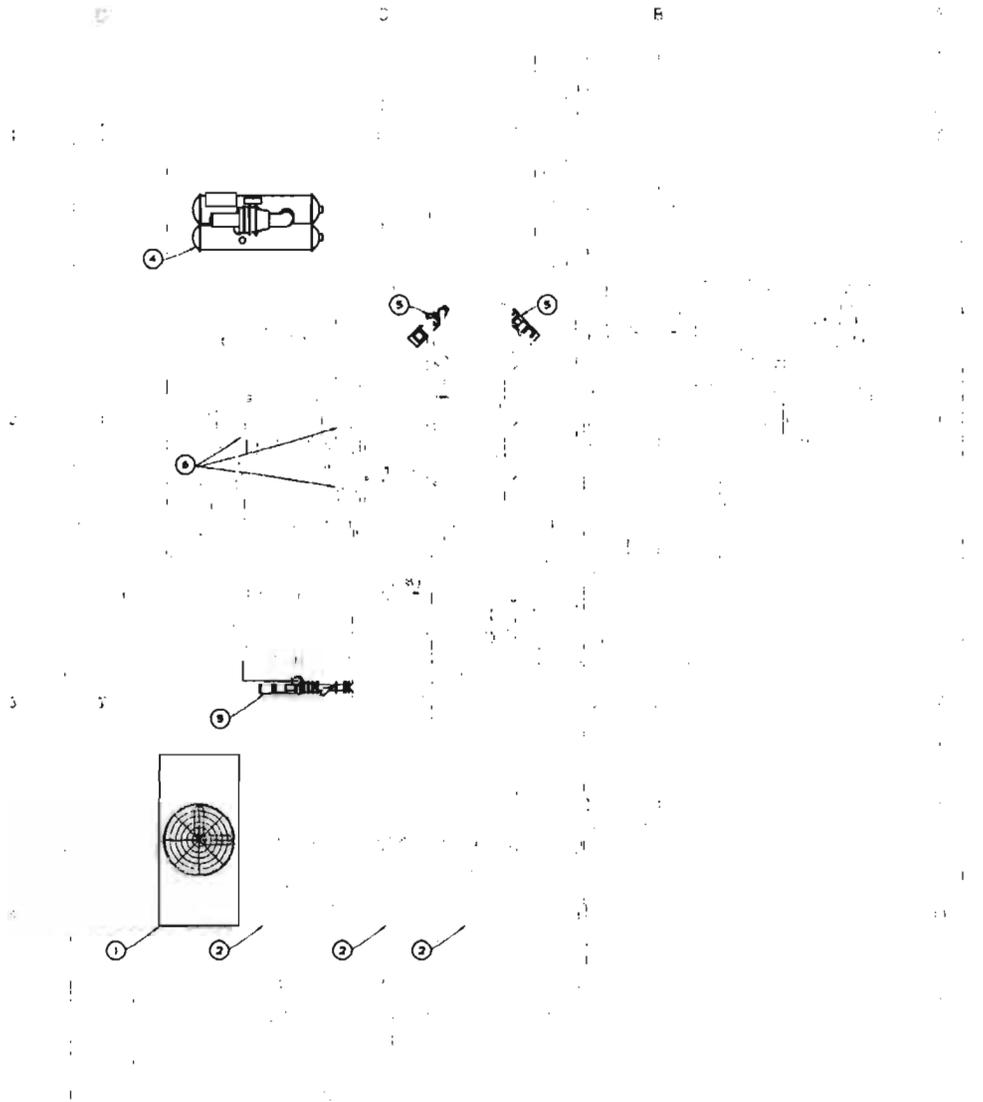
- ① NEW 6,000 MBH (OUTPUT) BOILER AND ASSOCIATED PRIMARY PUMP, PIPING
- ② EXTEND LIMITS OF CENTRAL PLANT.
- ③ NEW 14" CMH, 8" HWH DIRECT BURIED PIPING ADJACENT TO EXISTING. SEE SITE PLAN.
- ④ REMOVE EXISTING DIFFERENTIAL PRESSURE TRANSMITTER. SEE PHASE I SITE PLAN FOR NEW LOCATION.
- ⑤ EXISTING BOILER TO BE REMOVED AND SPACE TO BE UTILIZED FOR NEW SECONDARY H-HH DISTRIBUTION PUMPS - 350 GPM/70'.
- ⑥ MODIFY PIPING WITHIN BOILER ROOM FOR CONNECTION TO SITE PIPING AND NEW NORTH-DISTRIBUTION PUMPS, MODIFY PIPING AT MAKE-UP HEAT EXCHANGER.
- ⑦ NEW 420 TON CHILLER BRANCH PIPING
- ⑧ NEW 420 TON COOLING TOWER (TOP INLET, BOTTOM OUTLET), BRANCH PIPING



**ChevronTexaco**

Chevron Energy Solutions Company  
A Division of Chevron U.S.A. Inc.  
22700 CULLEN BOULEVARD  
HOUSTON, TEXAS 77048





**CHILLER PLANT**

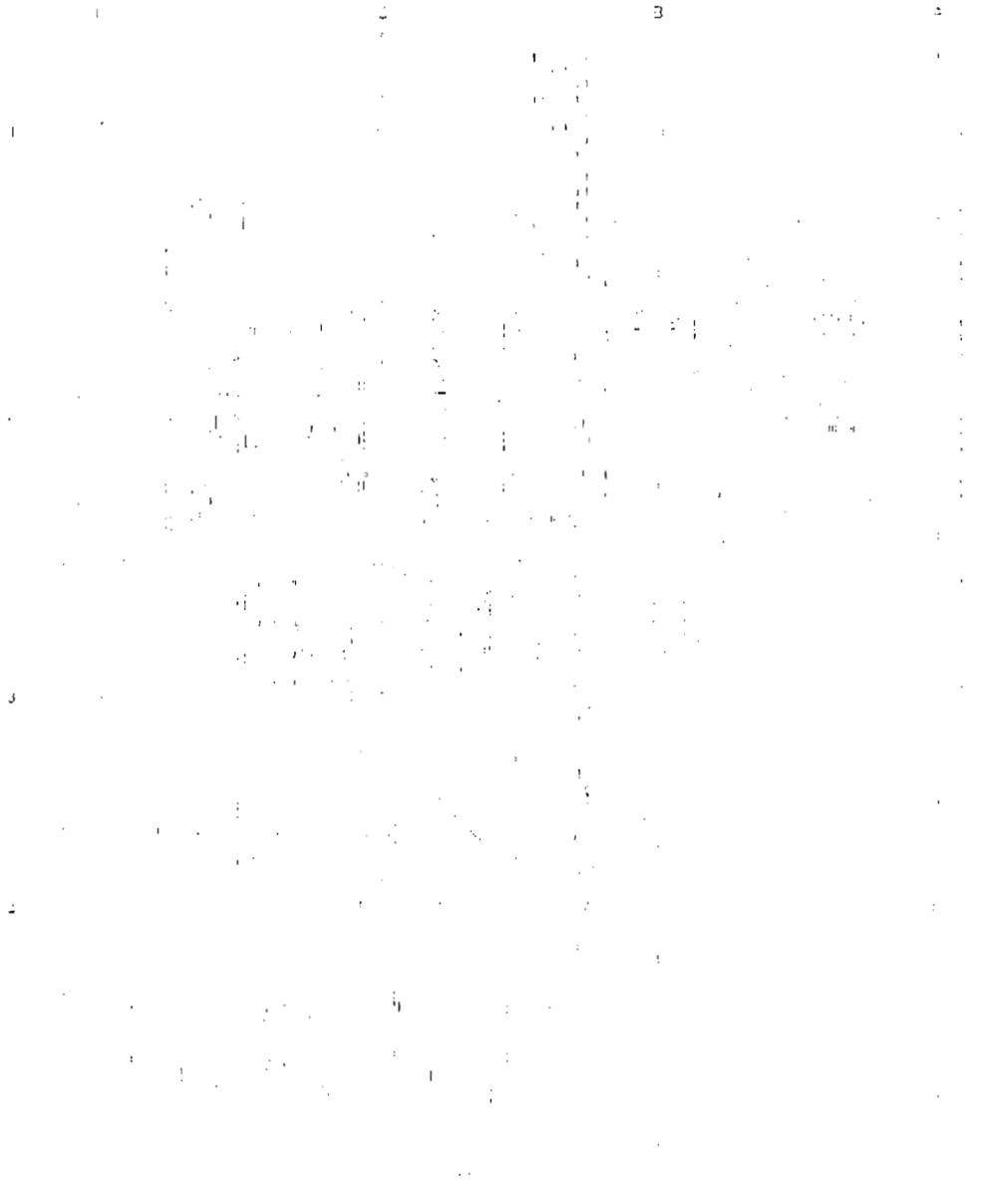
- ① NEW COOLING TOWER.
- ② NEW LOCATION OF EXISTING COOLING TOWER - RETROFITTED FOR BOTTOM OUTLET AND TOP INLET
- ③ NEW CONDENSER WATER PUMP
- ④ NEW CHILLER (420+ TONS)
- ⑤ NEW PRIMARY/SECONDARY CWH PUMP.
- ⑥ REMOVE AND REPLACE EXISTING CHILLED WATER PIPING WITHIN CHILLER PLANT. INCREASE PIPE SIZE AS REQUIRED FOR NEW SERVICE.



**ChevronTexaco**

Chevron Energy Services Company  
A Division of Chevron U.S.A. Inc.  
1001 DeGaulle Boulevard  
Houston, TX 77036





CHILLER PLANT - NO WORK REQUIRED



**ChevronTexaco**  
Chevron Energy Solutions Company  
A Division of Chevron U.S.A. Inc.  
1001 Pennsylvania Avenue, N.W.  
P.O. Box 1000  
Washington, D.C. 20044

**DEC**

Table 1: Existing and Future Heating Hot Water Loads

Building	Construction Phase	Construction Sequence	Location	ADP	Load Base	Load	Load	Compliance Comparison Load	Building Diversity Factor	Compliance Comparison Factor	Adjusted Load	Compliance Comparison Load	Plant Capacity	Number of Pumps	Notes
				(SF)	(BTU/hr)	(BTU/hr)	(MBH)	(MBH)			(MBH)	(MBH)	(MBH)	(MBH)	
<b>Building</b>															
Bldg 2 - Science and Tech - Heating	Existing	0	North	33,600	72	2,492,800	2,493		0.8	0.95	1626				VAW Pump Hoops
Bldg 3 - C190 Diesel Tech Lab	Existing	0	North			257,000	257		1.0	0.95	244				
Bldg 4 - Overflow Classrooms	Existing	0	North			280,000	280		1.0	1.00	260				
Bldg 5 - Instructional Center	Existing	0	North			659,000	659	3,670	1.0	1.00	659	2,800			Existing Boiler Capacity
Bldg 13 - Aquatic Center	Existing	0	NA	NA	NA	4,312,000	4,313	7,882	1.0	0.75	2234	6,215	5,800	(616)	
Bldg 17 - Health Education Science	Phase 1	1	South	55,000	34	2,000,000	2,000	9,882	1.0	0.95	1900	8,115	11,800	3,685	1
Bldg 18 - College Services Center	Phase 1	2	South	15,000	40	600,000	600	10,482	1.0	0.95	576	8,695	15,800	3,115	
Bldg 19 - Future LLRC	Phase 1	3	North	77,000	20	1,349,000	1,349	12,872	1.0	0.95	1463	10,148	16,000	5,852	2,3
Bldg 24 - Future Arts and Humanities Classrooms	Phase 2	4	North	30,000	30	900,000	900	12,921	1.0	0.95	855	11,003	15,000	4,007	
Bldg 22 - Future Cafeteria/Bookstore	Phase 2	5	North	45,000	30	1,350,000	1,350	14,372	1.0	0.95	1283	12,288	18,000	3,714	
Bldg 25 - Future Technology Classroom	Phase 2	6	North	30,000	30	900,000	900	15,172	1.0	0.95	855	13,141	18,000	2,859	
Bldg 4 - Future Science and Tech Lecture Hall	Phase 2	7	North	5,000	40	200,000	200	15,372	1.0	1.00	200	13,241	18,000	2,659	
Bldg 26 - Future Administration and SS	Phase 2	8	North	80,000	30	1,800,000	1,800	12,172	1.0	0.90	1719	16,051	16,000	945	
Bldg 27 Future Performance Arts	Phase 2	9	North	80,000	40	2,400,000	2,400	19,572	1.0	0.90	1200	18,251	18,000	(251)	
Bldg 1 - District Distribution Center	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 2 - Automotive Tech	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 7 - U100 Copper Plant	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 9 - Aviation Maintenance and Tech	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 10 - Overflow Classroom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 11 - CST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 12 - Child Development	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 14 - Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 15 - Unites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 18 - Future Greenhouses and Biological Pond	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 20 - Future Tower	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 21 - Future Automotive Bays	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 23 - Parking Structure	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Heating
Bldg 28 Future Transportation Tech Bldg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone

- ACORN
1. Install new 6000 MBH (output) boiler and associated piping/primary pumps.
  2. Install new 8000 MBH (output) boiler. Remove existing 1,800 MBH (output) boiler and use location for new secondary distribution pumps.
  3. Install new 8" size heating hot water distribution piping to new library. Parallel existing site piping near Central Plant.

Table 2: Existing and Future Chilled Water Loads

Building	Construction Phase	Construction Sequence	Location	ADP	Load Base	Load	Load	Compliance Comparison Load	Building Diversity Factor	Compliance Comparison Factor	Adjusted Load	Compliance Comparison Load	Plant Capacity	Number of Pumps	Notes
				(SF)	(BTU/hr)	(Tons)	(Tons)	(Tons)			(Tons)	(Tons)	(Tons)	(Tons)	
<b>Building</b>															
Bldg 2 - Science and Tech	Existing	0	North	33,600	167.5	200			0.8	1.00	160.0				VAW Pump Hoops
Bldg 3 - C190 Diesel Tech Lab	Existing	0	North			20			0.8	1.00	24.0				
Bldg 4 - Overflow Classrooms	Existing	0	North			30			0.8	1.00	24.0				
Bldg 5 - Instructional Center	Existing	0	North			150	370		0.8	1.00	88.0	295	600	304	
Bldg 17 - Health Education Science	Phase 1	1	South	50,000	250	200	570		0.8	1.00	160.0	486	600	144	1
Bldg 18 - College Services Center	Phase 1	2	South	15,000	300	42.9	613.9		0.8	1.00	34.3	490	900	118	
Bldg 19 - Future LLRC	Phase 1	3	North	77,000	250	300	928.9		0.8	1.00	248.4	736	1820	284	2
Bldg 24 - Future Arts and Humanities Classrooms	Phase 2	4	North	30,000	250	120	1069.9		0.8	1.00	84.0	822	1020	188	
Bldg 22 - Future Cafeteria/Bookstore	Phase 2	5	North	45,000	350	128.4	1109.5		0.8	1.00	102.9	926	1448	351	3,4
Bldg 25 - Future Technology Classroom	Phase 2	6	North	30,000	250	120	1209.5		0.8	1.00	96.0	1021	1440	409	
Bldg 4 - Future Science and Tech Lecture Hall	Phase 2	7	North	5,000	150	30.3	1222.6		0.8	1.00	25.6	1039	1440	282	
Bldg 26 - Future Administration and SS	Phase 2	8	North	80,000	300	171.4	1494.1		0.8	1.00	127.1	1196	1440	245	
Bldg 27 Future Performance Arts	Phase 2	9	North	80,000	200	700	1794.2		0.8	0.80	128.0	1215	1440	125	
Bldg 13 - Aquatic Center	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 1 - District Distribution Center	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 2 - Automotive Tech	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 7 - U100 Copper Plant	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 9 - Aviation Maintenance and Tech	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 10 - Overflow Classroom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 11 - CST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 12 - Child Development	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone
Bldg 14 - Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 15 - Unites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 18 - Future Greenhouses and Biological Pond	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 20 - Future Tower	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 21 - Future Automotive Bays	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 23 - Parking Structure	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Cooling
Bldg 28 Future Transportation Tech Bldg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Stand Alone

- ACORN
1. Install New 420 Ton Chiller, Cooling Tower and associated piping in location for future chiller in Central Plant
  2. Install New 14" size chilled water distribution piping to new library. Parallel existing site piping near Central Plant.
  3. Install new chiller, cooling tower, primary/secondary pumps and piping within Central Plant.
  4. Evaluate existing campus cooling load profiles to determine chiller size. Consider option between absorption vs electrical chiller.

**ChevronTexaco**  
 Chevron Energy Services Company  
 A Division of Chevron U.S.A. Inc.  
 2015 Energy Services  
 Planning & Design



Miramar  
Community  
College  
Facilities  
Master Plan

APPENDIX

*Facilities Services Standards Guide  
Building Construction Standards*

San Diego Community College District  
June 2005

PERKINS  
+ WILL