Hawai'i Community College
Manono Campus
Long Range Development Plan
2010 Revision and Update

Hawai'i Campus Developers, LLC

Final Report

11/15/2010

Cover Photo

Mauna Kea, elevation 13,796 feet or 4,902 meters, forms a dramatic background to Hilo Bay and the City of Hilo, Island of Hawai'i. Mauna Kea represents both a cultural asset to Native Hawaiians as well as an opportunity for the economic and educational future of the Island, as represented by the planned development of the Thirty Meter Telescope at the summit of Mauna Kea to further explore the Universe. The combining of these two diverse interests is similar to the challenge facing Hawai'i Community College in combining its past contributions and future plans to best serve the Island of Hawai'i.

Hawai'i Community College
Manono Campus
Long Range Development Plan
2010 Revision and Update

Final Report

Prepared For:
University of Hawai'i
and
Hawai'i Community College

Project No. UH-08-H03A

Prepared by:
Hawaii Campus Developers, LLC

November 2010

APPROVED BY:

Chancellor, Hawai'i Community College
University of Hawai'i — Date: NOV 4 2010

Associate Vice President, UH Office of Capital Improvements — Date: 11/9/10

Vice President, Community Colleges
University of Hawai'i — Date: NOV 12 2010

President, University of Hawaii — Date: 11/12/10

[This page intentionally left blank]

EXECUTIVE SUMMARY

This Long Range Development Plan (LRDP) updates the Manono Campus Study that was completed in 1998. In the years since then, changing circumstances and expanded educational requirements have necessitated a revision and update to the original document. The purpose of this project is to provide a plan for Hawaii Community College (HawCC) to consolidate its activities in East Hawaii to the current Manono Campus site.

Changes to the long-term vision for Hawaii Community College, as well as changes in the East Hawai'i community and the progression of nearby development projects, have all contributed to the need to update the LRDP.

This LRDP update incorporates major changes from the 1998 Study, including the following:

- Continuing deterioration of the current Manono Campus physical plant. The backlog of maintenance and repairs is conservatively estimated at $1.7 million, and an additional $14.0 million will be needed in the next ten years for capital renewal.
- An Increase in internet education and in distance learning, which requires increasing investment in IT resources and infrastructure.
- A concerted effort to begin the development of a West Hawaii campus.
- The continuing need to rely on resources at the UH Hilo Campus in the face of planning to further develop that campus for upper level curriculum and support. Today the UH Hilo campus accommodates more Hawaii Community College students than does the Manono Campus.

The Program Requirements for the Community College East Hawaii activities include learning spaces, student services, staff and faculty support, accessory spaces and surface spaces such as secure yards for technical programs, gardens to support the Culinary and Hawaiian Studies programs and an outdoor play area for the Early Childhood program.

The update is based on a workload requirement to support the campus activities of 2,000 full-time equivalent students (FTES), which is an increase of approximately 25% over to the F09 actual FTES. The space requirements for this workload were developed in an earlier update to the Hawaii Community College Educational Specifications and became the basis for further planning in this LRDP.

The LRDP Update follows the traditional planning process.

- It begins with a restatement of Program Requirements followed by a site assessment and a description of planning requirements.
- There is a brief consideration of site utilization options. Due to constraints, there is a single site, and it is the current Manono Campus parcel.
- Three alternative layouts for the site were developed and considered. The first two show how all activities could be relocated to the site, while the third layout portrays the benefits of relocating the majority of activities while leaving the

Applied Technical Education shops at the UH Hilo Campus or possibly relocating them to a parcel adjacent the Manono Campus parcel.

- The third option was chosen for further development as the Ultimate Site Plan and additional detailed plans for landscape architecture, civil, electrical, and mechanical were developed.
- Next the LRDP includes a four phase Transition Plan that portrays how current activities are maintained while the campus is re-developed. The plan is estimated to take approximately twelve years.
- The final element is a cost estimate for the four phase plan, which totals $263 million.

The vision for a re-developed Manono Campus is realistic and achievable. The investment will benefit future students and the community.

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 BACKGROUND

This Long Range Development Plan (LRDP) updates previous Hawaii Community College LRDPs, prepared in 1996 [1] and updated in 2003 [4] and the 1998 Manono Campus Study completed in 1998 [3]. Changing circumstances and expanded educational requirements necessitate a revision and update to these documents.

Over the years, a number of important instructional and academic support activities have relocated from the Manono Campus to the UH Hilo site. Today more than half of all instructional activity takes place on the Hilo or upper campus. The split campus is inefficient and marginally meets the needs of students, faculty and staff.

Hawaii Community College has initiated a number of studies to consolidate the campus to a single site. The 1996 LRDP and its 2003 Update envisioned relocating all community college elements on the east side of Hawaii Island to a new site at Komohana. There was a study in 1998 [2] to relocate all elements to downtown Hilo. This was followed by the 1998 Manono Campus Study, which examined the feasibility of relocating all but a subset of activities to the Manono Campus site. While several of these studies have been approved by the UH Board of Regents, none has been implemented.

1.2 PURPOSE AND OBJECTIVES

The purpose of this project is to produce a LRDP update (Manono LRDP) to enable Hawaii Community College to relocate as many activities as possible from the upper campus to a consolidated campus at the Manono site.

The objectives [5] are to:

- "Revise the site and facilities development ultimate plan, including, without limitation, designating or recommending new capital improvement projects, renovation projects, and major maintenance and repair projects, in a form and manner that would best accommodate the education program needs of the Hilo Manono campus, is economical in cost, and complies with government, utility, and historical/aesthetic/environmental requirements;

- Revise the civil, landscaping, and electrical/communications ultimate plan to implement the site LRDP;

- Develop a facilities implementation plan that will satisfy the short and long-range requirements of the Hilo Manono campus, including, without limitation, new capital improvement projects, renovation projects, and major maintenance and repair projects. Provide square foot cost estimates for each phase of the implementation plan, including ultimate cost of total phases. The date (month/year) of the estimates shall be indicated for future construction implementation reference by OCI;

- Update architectural design and landscaping guidelines to ensure cohesive and aesthetic campus development;

- Develop and incorporate into the Manono LRDP a barrier free and site accessibility program.

- Provide a strategy for LEED Silver certification or other higher or comparable certification for new construction.

- Document the above items for reference and control during implementation of construction projects for the Hilo Manono campus; and

- Prepare a report to document the planning criteria, evaluations, and decisions which were used in the preparation and adoption of the updated Manono LRDP."

1.3 METHODOLOGY

The planning effort includes three (3) components, which are necessary before design and construction can begin.

1.3.1 Educational Specifications

The purpose of the "Educational Specifications" component is to establish a baseline of program requirements for subsequent planning. The Educational Specifications examine functional relationships, enrollment projections, curriculum, space requirements and functional relationships for land planning and architectural design. This information is consolidated into a space allocation table with the space name, number of rooms, and known or estimated square footage for each space along with functional relationship diagrams. The Educational Specifications reflect the physical space needs and space requirements of the consolidated Manono Campus.

The Educational Specifications are based on data furnished by UH and the community college and information developed by Hawaii Campus Developers from focused research of space planning in other large public universities across the country.

Preparation of the Educational Specifications is the first major activity of the LRDP process. Data from the Educational Specifications and other relevant planning criteria provide the basis for physical planning and site development.

1.3.2 Long Range Development Plan

With the Educational Specifications providing key information on programs, functions, square footage, and other educational design requirements, the Long Range Development Plan process addresses land planning, building programming, site development, infrastructure, utility requirements, general design considerations, and implementation strategies. Subsections of the LRDP are described in the following paragraphs.

Program Requirements This section of the LRDP establishes specific program and planning requirements for the Manono Campus. The campus organization, educational programs, staffing, and student enrollment provided in the Ed Specs are summarized. The last task in Program Planning is the preparation of a functional relationship diagram that shows the ideal functional groups and relationships between the elements.

Site Assessment: This section of the LRDP evaluates all existing conditions on the Manono site including traffic, roadway improvements, adjacent land use, easements and right-of-ways, environmental concerns, archaeological concerns, and soil conditions. Careful analysis of sewage disposal, drainage, and water supply systems as they affect site utilization is also accomplished.

Planning Criteria: These are issues and concerns germane to the planning of the Manono Campus. Criteria include, among others, site accessibility; internal circulation, accessibility, parking and loading; utility services such as electricity and water; preservation of historic and cultural sites; environmental controls such as ventilation, air conditioning and lighting; and security and safety devices such as fire and security alarms.

Site Utilization: The task entails the determination of how to best use the project parcel to accomplish the goals of the project. Sometimes there are opportunities to select from among several different building sites but when space is limited, as is the case in this project, the only option may be to use the entire parcel as the building site.

Alternative Site Plans: In this section, the information provided in the previous sections is used to develop three (3) alternative site plans that are drawn to scale. Each site plan includes the following elements:

- Building locations, configurations, functions and number of stories;
- Archaeological sites, if any;
- Vehicle access and roadways;
- Service and emergency access;
- Parking lot configurations and capacities;
- Pedestrian walkways, ramps, malls and courtyards;
- Setbacks;
- Open spaces;
- General landscaping.

The alternative plans are compared and one is chosen as the preferred site plan.

Ultimate Plans: In this section, an ultimate site plan, based on the preferred alternative site plan is prepared. The ultimate site plan incorporates recommendations from Hawaii Community College and University administration. The following schematic plans prepared by engineering sub-consultants and the architect are presented:

- Ultimate Civil Plans;
- Ultimate Landscaping Plan;
- Ultimate Electrical & Communication Plans; and

- Ultimate Mechanical Plan.

Architectural Barrier-Free Program: The intent of this section is to ensure that the Manono Campus is designed for accessibility. A barrier-free access plan is included.

Design Considerations and Guidelines: In this section, guidelines are established to provide an architectural style and character for the campus. These guidelines will be used to control building materials, colors, and other peripheral design elements. Building security, operations, ease of maintenance, and safety are also considered.

Implementation and Transition Plan: The Implementation and Transition Plan addresses how existing facilities and programs will be transitioned into the reconfigured site.

Cost Estimates: The preferred site plan is used to derive a cost estimate that encompasses all the physical facilities and infrastructure necessary to serve ultimate projected student enrollment at the Manono site. The detailed cost estimate will be used to determine phasing and budgeting for implementation of the LRDP and the actual design and construction of the campus.

1.3.3 UH Participation

During the course of the LRDP update process, several presentations were made to UH administration, faculty and staff. The comments and concerns voiced during these presentations have been duly considered. Various suggestions have been incorporated in this LRDP Update.

2.0 PROGRAM REQUIREMENTS

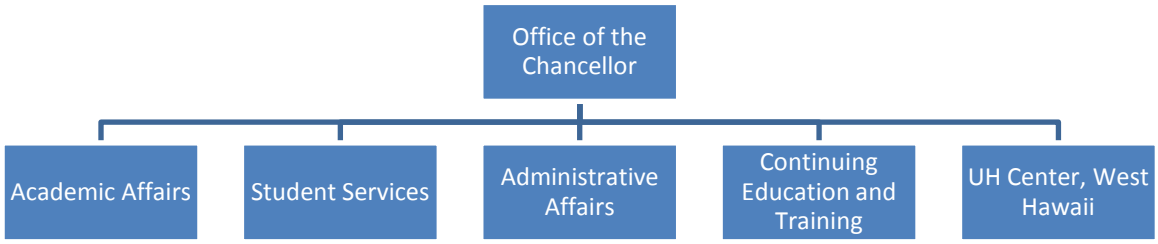
2.1 DESIGN ENROLLMENT

Information contained in the *Manono Campus Educational Specifications Update: Final Report* dated August 31, 2010 [8] (Ed Specs), provide the basis for the planning for the Manono Campus. Physical space needs have been projected for an ultimate load of 2,000 Full-time Equivalent Students (FTES).

2.2 EDUCATIONAL AND FUNCTIONAL REQUIREMENTS

The Educational Specifications contain descriptions of program needs and estimates of related Assignable Square Feet (ASF)*. Program needs are identified for the Hawaii Community College Organizational elements shown on the organizational chart below (Figure 1).

Figure 1
Organization Chart



Program planning involves translating the requirements identified in the Educational Specifications into estimates of Gross Square Feet (GSF) (refer to Table 1).

* Assignable Square Feet – space that is assigned to a department or function, usually measured from interior wall to interior wall. Building space types or categories include faculty/staff offices and related areas such as admin workspaces and storage; classrooms, class labs, and shops. For land planning purposes, ASF may also include outdoor requirements for storage or curriculum specific spaces such as an herb garden for the Culinary program. ASF does not include structural space, i.e., wall thickness or public spaces such as corridors, public restrooms or mechanical space. These are referred to as "Non-assignable Spaces," (NSF). Total space in terms of Gross Square Feet (GSF) is the sum of ASF and NSF. In the planning phase, NSF is determined by a "gross-up factor," anywhere from 0 to 50 percent and GSF is calculated as GSF = ASF * (1+gross-up factor).

Table 1
Program Space Requirements

	Spaces	ASF	GSF
I. Office of Chancellor			
A. Office of Chancellor	8	1,954	2,931
II. Academic Affairs			
A. Office of Vice Chancellor, Academic	7	1,304	1,956
C. Career & Technical	388	170,380	218,174
D. Liberal Arts & Public Service	199	90,351	134,027
E. Academic Support	75	25,052	37,578
III. Student Services			
A. Dean's Office, Student Services	8	3,643	5,465
B. Enrollment Services	23	6,800	10,200
C. Counseling and Student Life	54	22,512	33,768
D. Contract Food Service	14	5,500	8,250
E. Health Ctr.	3	437	656
IV. Administrative Affairs			
A. Office of Vice Chancellor, Admin	5	904	1,356
B. Business Office	14	3,412	5,118
C. Human Resources	7	1,392	2,088
D. Planning, Opns & Maint.	34	10,734	14,001
V. Continuing Ed & Trng			
A. Administration	6	2,435	3,653
B. Apprenticeship	2	5,144	5,216
C. Non-credit Programs	5	464	696
Grand Total	**852**	**352,418**	**485,131**

It is estimated that the Manono Campus will require 352,418 ASF to accommodate the immediate space needs as determined by the Ultimate FTES Load of 2,000 FTES. The distribution of space by organizational function and space type is shown in Table 2.

As shown in Table 1, "Gross up" factors were applied to transition from ASF to GSF to allow for non-assigned spaces including such areas as public spaces, restrooms, mechanical spaces and general internal circulation. The factors were 150% for all areas except shops, to which a factor of 125% was applied. The latter was based on analysis of existing shop spaces, which generally do not include the same frequency of non-assigned spaces as other areas.

Table 2
Program ASF Requirements by Space Type

	1-FS	2-CR	3-LB	4-Shop	5-AC	6-YD	Total
I. Office of Chancellor							
A. Office of Chancellor							
1. Office of Chancellor	330				1,400		1,730
2. Recruitment	224						224
II. Academic Affairs							
A. Office of Vice Chancellor, Academic							
1. Office of Vice Chancellor, Academic	504				800		1,304
C. Career & Technical							
1. Dean's Office, C&T	255				720		975
2. Nursing	2,528	1,871	3,625		2,630		10,654
3. Business Education & Technolology	1,232	4,000	1,500		2,076		8,808
4. Culinary	1,376	1,200		7,500	9,009	1,200	20,285
5. ATE-Agriculture	288	1,000	3,000		600		4,888
5. ATE-Arch, Engr & CAD	576	600	2,160		1,200		4,536
5. ATE-Autobody Rpr & Paint	432	600		9,500	3,550	4,000	18,082
5. ATE-Automotive Tech	864	600		10,200	4,750	4,000	20,414
5. ATE-Carpentry	432	600		8,550	6,430	6,500	22,512
5. ATE-Contr Acad	224				440		664
5. ATE-Diesel Mech	288	600		3,000	9,620	4,000	17,508
5. ATE-Divisional Spaces	160				1,390		1,550
5. ATE-Elect Maint & Inst	576	600		4,160	3,800	4,000	13,136
5. ATE-Electronics	144	600		980	1,660		3,384
5. ATE-Mach Tech	144	600		2,480	3,700	3,000	9,924
5. ATE-Welding	720	600		5,360	3,380	3,000	13,060
D. Liberal Arts & Public Service							
1. Dean's Office, LA & PS	495				1,560		2,055
2. SocSci-Div Spaces	1,872	7,000	1,500		2,014		12,386
2. SocSci-Early Childhood	448		1,500		4,030	1,800	7,778
3. English	2,304	9,000	1,500		1,938		14,742
4. Math & Natural Science	2,880	10,000	6,000		7,200		26,080
5. Humanities-Digital Media Arts			1,200				1,200
5. Humanities-Div Spaces	2,096	6,000			1,534		9,630
5. Humanities-Fine Arts				3,600	4,300		7,900
5. Humanities-For Lang					120		120
5. Humanities-HawSt	960	3,000	1,500	1,200	600	1,200	8,460
E. Academic Support							
1. Learning Center/Library	1,712		8,640		10,280		20,632
2. Academic Computing	640				1,460		2,100
3. Institutional Research	320						320
4. Sustainability Learning Center		1,000	1,000				2,000

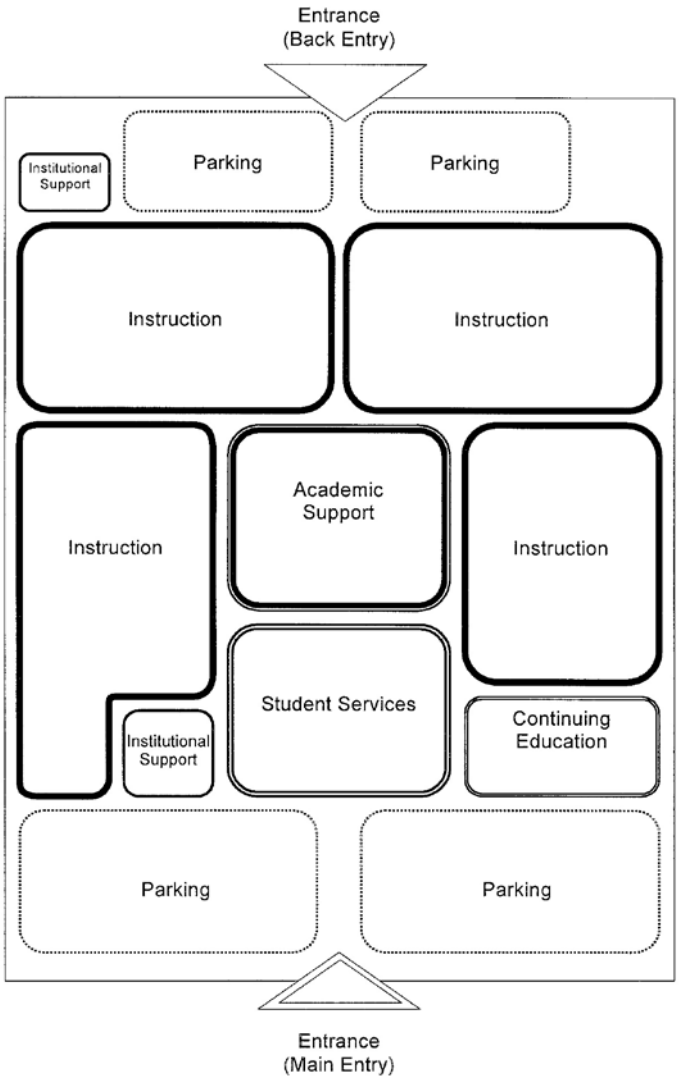
Table 2 (cont'd)
Program ASF Requirements by Space Type

	1-FS	2-CR	3-LB	4-Shop	5-AC	6-YD	Total
III. Student Services							
A. Dean's Office, Student Services							
1. Dean's Office, Student Services	255				3,388		3,643
B. Enrollment Services							
1. Staff	960						960
2. Admissions & Records					3,600		3,600
3. Financial Aid					2,240		2,240
C. Counseling and Student Life							
1. Staff	2,352						2,352
2. Bridge Programs					2,700		2,700
3. Counseling & Guidance/Human Dev					3,740		3,740
4. Special Programs					13,720		13,720
D. Contract Food Service							
1. CFS					5,500		5,500
E. Health Ctr.							
1. Health Center					437		437
IV. Administrative Affairs							
A. Office of Vice Chancellor, Admin							
1. Office of Vice Chancellor, Admin	504				400		904
B. Business Office							
1. Staff	912						912
2. Other					2,500		2,500
C. Human Resources							
1. Staff	592						592
2. Other					800		800
D. Planning, Opns & Maint.							
1. Office of Planning, Operations & Maintenance	224				3,610	4,200	8,034
2. Janitorial Services	960						960
3. Groundskeeping	320				1,100		1,420
4. Maintenance	160						160
5. Security	160						160
V. Continuing Ed & Trng							
A. Administration							
1. Staff	335						335
2. Other		2,100					2,100
B. Apprenticeship							
1. Staff	144						144
2. Other						5,000	5,000
C. Non-credit Programs							
1. Staff	464						464
Total	**33,366**	**51,571**	**33,125**	**56,530**	**135,926**	**41,900**	**352,418**

2.3 FUNCTIONAL RELATIONSHIPS

Facility planning strives to draw appropriate associations between the identified program elements. HawCC generated the idealized functional relationship diagram presented as Figure 2. The diagram illustrates the desired organization of the campus according to generalized campus components. As depicted in the diagram, Academic Support facilities are central to the campus and surrounded by Instructional facilities. Continuing Education, Student Services and Administrative Affairs are other components that complete the core of the campus. Parking areas create a buffer between the core area and the two campus access points (one main entry and a back entry). Support facilities in the form of auxiliary services are located away from core facilities at the edge of the campus.

Figure 2
Idealized Functional Relationship Diagram



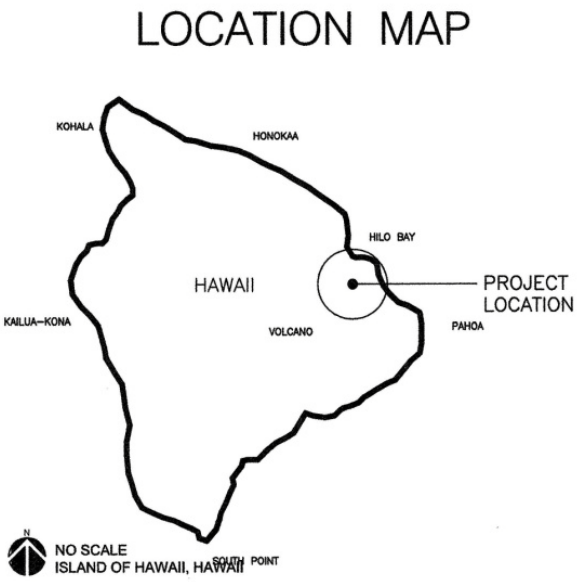
[This page intentionally left blank]

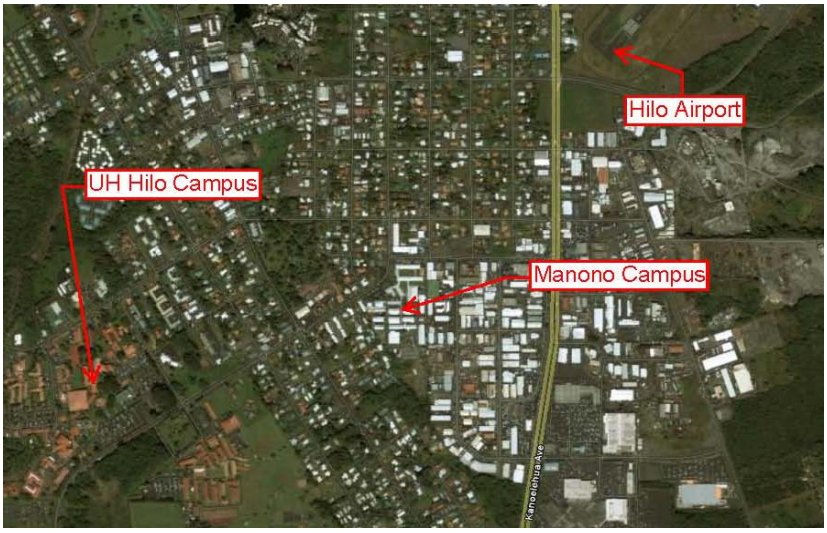
3.0 SITE ASSESSMENT

3.1 LOCATION/LANDOWNERSHIP

The Hawai'i Community College (HawCC) Manono campus is centrally located in the city of Hilo, east of the University of Hawai'i Hilo campus (Figure 3).

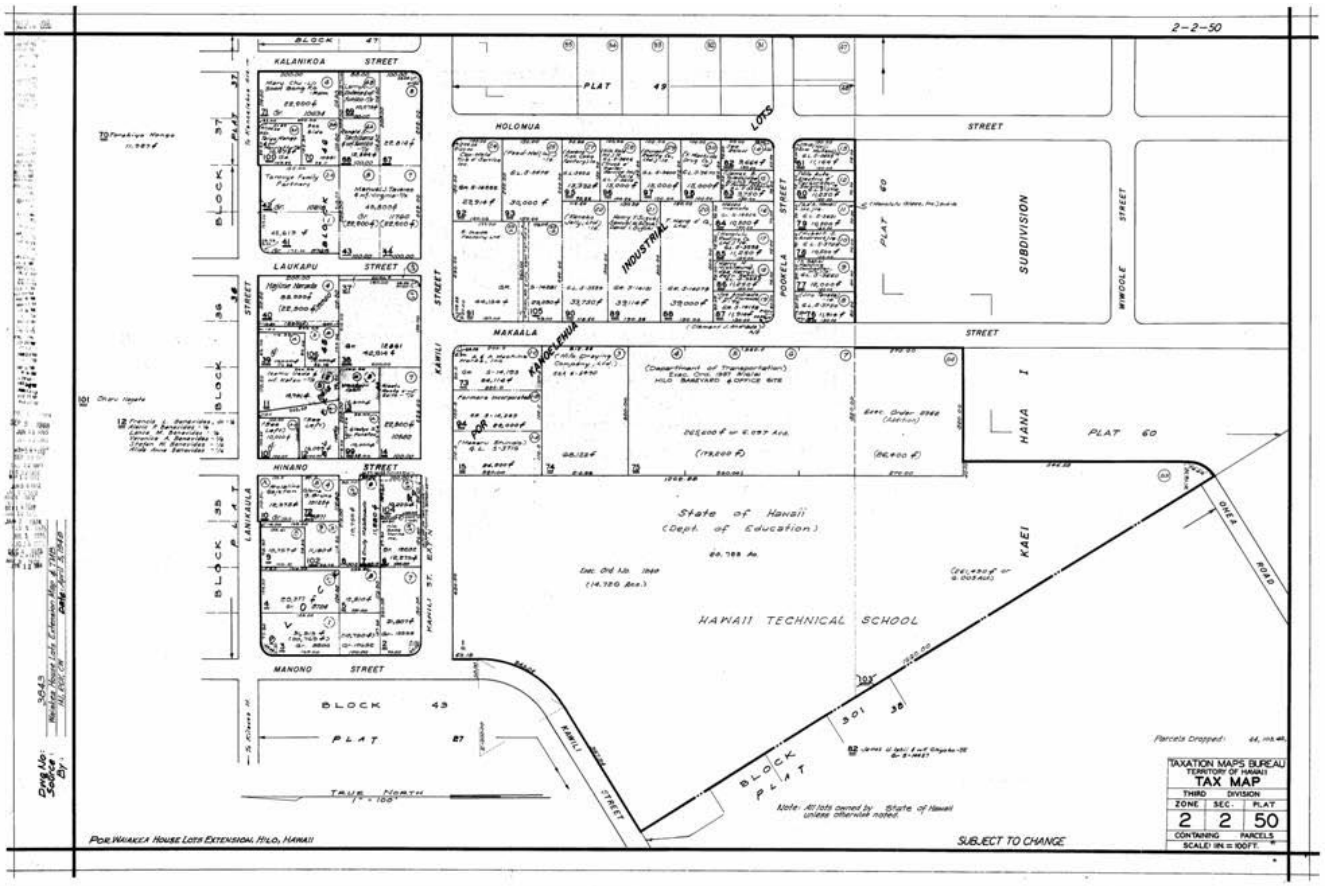
Figure 3
Location and Vicinity Maps





The campus is located on a 20.7-acre triangle shape parcel identified as Tax Map Key 2-2-50: 01 (Figure 4). The property is owned by the State of Hawai'i and has been identified as ceded land by the Department of Land and Natural Resources. It has been given a ceded status of "B," State lands acquired under Section 5B of the Admissions Act.

Figure 4
Tax Map 2-2-50



3.2 EXISTING AND SURROUNDING LAND USES

The northern portion of the property is currently used as the Hawai'i CC Manono campus, as shown in Figure 5.

Approximately 5.4 acres of land extending from the central portion of site to the southern end of the property is vacant land. Temporary parking and a building for the nursing program are now situated on a portion of the vacant land. The campus is bordered by East Kawili Street to the northwest and Kawili Street to the north. Land uses abutting these roadways include primarily single-family residential properties to the west, and a mix of commercial, light industrial and residential uses to the north of the campus. Land uses to the east of the property include industrial uses associated with the Kanoelehua Industrial Area. The State of Hawai'i Department of Transportation (DOT) Base Yard is located directly adjacent to the eastern central portion of the property.

[This page intentionally left blank]

Figure 5
Manono Campus Existing Configuration

[This page intentionally left blank]

3.3 TOPOGRAPHY

There is limited topographic information available for the campus property. Based on available information, elevations within the developed portions of the campus (the central and northern portions of the property) range from approximately 50 feet mean sea level (msl) at the eastern edge of the site, to about 55 feet msl at the western end of the site. This area is relatively flat with an avenge slope of less than one percent. Although there is no topographic information available for the southern portion of the property, a visual inspection revealed that this portion of the site also appears to be characterized by relatively flat terrain.

3.4 CLIMATIC CONDITIONS

The project site is usually subjected to northeasterly (onshore) winds during the day. These winds predominately range from four to 12 miles per hour. However, diurnal heating and cooling occasionally gives rise to offshore (southwesterly) breezes at night. Daytime temperatures in degrees Fahrenheit range from the upper 70's to the low 80's, while temperatures at night range from the low 60's to upper 70's. The mean annual rainfall in this area is estimated at about 141 inches, or about 10 to 15 inches per month. Although the wet season usually occurs from October through April, rain falls approximately 280 days out of the year.

Hilo's rainy climate requires design and planning considerations encouraging the use of covered walkways, covered outdoor gathering areas, and clustering of structures to minimize exposure to the rainy weather.

3.5 FLOODING, DRAINAGE AND WETLANDS

According to the Flood Insurance Rate Map (FIRM), the study area is identified as being in Zone X, "Areas identified as being outside the 500-year flood plain." The property is serviced by drainage culverts, open swales, and dry-wells. Accumulated rainfall is accommodated through the use of grated intakes, culverts and dry-wells rather than allowing the water to run off the property. According to staff at the college, portions of the campus experience periodic localized flooding and ponding during periods of high rainfall.

3.6 FLORA AND FAUNA

Vegetation on the campus consists primarily of introduced or alien species. The developed portions of the campus are sparsely vegetated. The undeveloped portions of the property show signs of previous disturbance and are covered with largely introduced and exotic species. Therefore, the likelihood of encountering rare, threatened, or endangered plant species or important specie habitat within this portion of the site is relatively low. However, botanical and biological surveys of the currently undeveloped portion of the campus would be a standard part of the environmental requirements of Chapter 343, Hawai'i Revised Status (HRS), prior to development.

3.7 ARCHAEOLOGICAL RESOURCES

According to the Department of Land and Natural Resources, State Historic Preservation Division (DLNR, SHPD), there has been no archaeological survey conducted of the site. However, given the disturbed nature of the site, the likelihood of encountering historical or cultural remnants on site would be relatively low. It is recommended that prior to development, as part of the environmental requirements of Chapter 343, HRS, a formal determination on the potential impact to sites of historical or cultural importance is obtained from SHPD. During the construction period, should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered, work in the immediate area should be suspended and the treatment of such features should be conducted in strict compliance with the requirements of the DLNR, SHPD and Hawai'i County Ordinances.

3.8 TRAFFIC ACCESS, CIRCULATION AND PARKING

From a regional perspective, the campus can be accessed from Kilauea Avenue, Manono Street (East Kawili Street) and Kanoelehua Avenue, three of the primary arterials through Hilo, by way of either East Kawili Street or Kawili Street, respectively.

East Kawili Street is a two-lane roadway within a 50' right-of-way that provides access to the north and south portions of Hilo. From the campus site, the roadway extends westward providing access to the UH Hilo campus and turns southward, becoming 'Iwalani Street. At the northwestern corner of the Manono campus, where East Kawili Street intersects with Kawili Street, East Kawili Street extends northward becoming Manono Street. Kawili Street extends along the northeast edge of the property eastward to intersect with Kanoelehua Avenue.

The property can also be accessed from East Ohea Street, a narrow residential street, which terminates at the southern corner of the property. In addition, an abandoned access in the central, eastern portion of the property traverses through Hawaiian Home Lands and provides a potential connection to the campus from Maka'ala Street.

The City of Hilo Road Alignments, Rights-of-way, and Zoning Map indicates that the East Kawili/Kawili Street intersection is to be reconfigured, such that East Kawili would be straightened to cross the northern portion of the property and continue eastward to Kanoelehua, with Manono Street forming a T-intersection in the general area of the current East Kawili/Kawili Street intersection. East Kawili Street would also be widened to an 80 foot Right-of-way (ROW). The potential realignment and widening of the major roadways fronting the campus will impact the campus development by reducing the campus area to approximately 19.5-acres and increasing the design speeds in this area. The realignment and widening of Kawili Street and the resulting reconfiguration of the property were assumed as part of the planning for the campus site. The realignment and widening of Kawili Street is yet unplanned and the timing of such a realignment is unknown.

3.9 EXISTING BUILDINGS

There are 27 buildings, including the new temporary buildings. The buildings meet code and safety requirements but some do not meet functional needs.

According to a 2009 study by the Pacific Partners Consulting Group, the backlog of maintenance and repair as of spring 2009 was $1 million. [7]

The ten-year capital renewal requirements are $8.8 million.

Building 383, Hale Aloha is being renovated extensively to LEED Silver Standards for primary use to support the Nursing program. The renovated Hale Aloha will be included in future campus plans.

Although other buildings are candidates for renovation, it was determined that to meet the goal of relocating programs to the Manono site it would be necessary to demolish the remaining buildings and replace them with new, efficiently sized and configured structures.

Table 3
Existing Buildings

Bldg		GSF
378	Administration	3,474
379	Student Services	6,955
379A	OCET/FAO	4,480
380	AEC	12,066
381	Liberal Arts	12,150
381A	Na Pua No'eau	2,688
381B	MPA	1,700
382	Culinary, Cafeteria	20,844
383	Nursing	16,637
385A	Apprenticeship	2,688
385B	Ceramics	1,344
385C	Art	1,344
386A	Science Lab/Storage	5,978
386B	Carpentry	3,023
387	IT/Computer LAB	5,978
388	Classrooms, Offices	6,477
389	Aux Shop	5,978
389A	Hula Studio	1,081
390	Carpentry	8,418
391	Electrical/Electronics	15,183
392	Services	8,243
393	Ag/Early Childhood	9,506
394	UHH Art Classrooms	4,845
395	UHH Art Dept	4,467
396A	Portable	2,240
396B	Portable	1,680
397	Business Office	2,380
	Total	171,847

3.10 VISUAL RESOURCES

Views from within the campus are limited due to the relatively flat topography of the campus property. On clear days, distant views of Mauna Kea and Mauna Loa can be seen from portions of the site. The primary views of the campus from surrounding areas include views from East Kawili Street, Kawili Street. There are also intermittent views of the campus from Maka'ala Street and Manono Street, and from the commercial, industrial and residential areas that border the campus.

3.11 EASEMENTS

Existing property tax key maps indicate no easements over the site that would impact development, nor are there any known to exist by the UHH Facilities Planning Office.

3.12 AIRCRAFT NOISE AND APPROACH ZONES

The Federal and State governments established guidelines restricting development in areas subject to significant environmental noise impacts. The description typically used to assess environmental noise is the "day-night" average sound level or LDN. Average noise levels associated with Lyman Field were compiled by the State of Hawai'i as part of a 1988 Noise Exposure Map Report prepared for the State Department of Transportation in the Hilo International Airport-FAR Part 150 Noise Compatibility Program, Volume II Noise Compatibility Report. According to the report, the campus property is not subject to any noise constraints associated with operations at Lyman Field.

According to the Hilo Airspace Plan, a majority of the campus property is within the approach and transitional zones of Runway 3. The building height limit restrictions related to the approach zones in the northeastern corner of the property is about 85 feet. This, however, should not pose a constraint to development of a campus with buildings under four stories in height. Table 4 is a comparison of permitted building heights under zoning codes and airspace regulations.

Table 4
Permitted Building Height Comparison

Item	Hawaii County Code (Residential RS)	Hawaii County Code (University District)	Hilo Airspace Plan
Maximum Building Height Permitted*	40 ft.	60 ft.	85 ft.

* The minimum permitted height controls.

4.0 PLANNING CRITERIA

4.1 LAND USE CONTROLS AND POLICIES

4.1.1 Land Use Regulations and Zoning

State Land Use Designation. The Manono campus is entirely within the State Land Use Urban District.

County of Hawai'i General Plan Designation. The study area is designated on the County of Hawai'i General Plan Land Use Pattern Allocation Guide (LUPAG) map for "Medium Density" uses, and the adjacent Kanoelehua Industrial Area designated for "Industrial" use.

Special Management Area. The site is located outside of the Special Management Area and is, therefore, not subject to the County SMA Use Permit requirements for development.

County of Hawai'i Zoning. The County of Hawai'i zoning designation for the study area is Single-Family Residential (RS-1O). Under the County Zoning Code, Section 24-4-11, the campus is permitted as a "public use," provided the director has issued plan approval for such use.

In 2007, the County of Hawai'i adopted Ordinance No. 07-104, Section 3, which provides for a University District (UNV) zoning (Section 25-7-31 of the Hawai'i Code). The University District provides more flexibility in types of uses including up to twenty percent (20%) for commercial use serving the university and increased height allowances. As of the date of this report, the subject campus property has not been zoned as a University District, which would require a separate zoning ordinance.

The UNV Zoning designation is more favorable for campus planning than the existing RS Zoning designation. Consequently, all subsequent planning and analysis will employ the features and restrictions associated with UNV Zoning.

4.1.2 Chapter 343, HRS Environmental Impact Statement Process

Development of the proposed facility would require an environmental assessment, and, if necessary, an Environmental Impact Statement in compliance with the requirements of Chapter 343, HRS, due to the use of State lands or funds for the project.

4.1.3 Historic and Cultural Sites

Prior to development, State mandated environmental requirements as well as Chapter 343, HRS, requires a formal determination on the potential impact to sites of historical or cultural importance be obtained from the State Historic Preservation Department (SHPD) of the Department of Land and Natural Resources.

The requirements of the DLNR, SHPD and Hawai'i County Ordinances require that during the construction period, should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered, work in the immediate area should be suspended and the treatment of such features should be conducted in strict compliance with existing Rules, Regulations and Ordinances.

4.1.4 ADA (American with Disabilities Act)

The ADA (Americans with Disabilities Act) of 1990 sets guidelines for accessibility to buildings and facilities by individuals with disabilities. These guidelines are to be applied during the design, construction, and alteration of buildings and facilities covered by Titles II and III of the ADA to the extent required by regulations issued by Federal agencies, including the Department of Justice and the Department of Transportation, under the ADA

Site Considerations: Primary site accessibility shall be provided from all entrance points to the site to all individual facilities that require access. Handicapped parking and accessible routes in accordance with ADA must be provided to link all campus facilities.

Building Consideration: All facilities must be accessible to individuals with disabilities, as governed by the ADA.

• At least one entrance, preferably the principal entrance, must interface with an accessible route on the site.
• Access must be provided to all floors of all buildings except in unusual circumstances.
• All toilet facilities must be accessible.
• Emergency egress must be provided for the disabled equal to that provided for able-bodied occupants.

The requirement to provide access to all floors almost ensures that every new building two stories or higher must include an elevator(s). With higher building heights, there would be an opportunity to concentrate campus facilities with a core accessible to pedestrians and individuals with disabilities, resulting in: shorter walking times between classes, lower infrastructure and covered walkway construction cost, and more open space and/or future expansion area options.

4.2 LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED™)

Design and development of the Manono Campus must achieve, at a minimum, a LEED™ Silver rating as mandated by the State of Hawai'i for public facilities. Attainment of a higher LEED™ rating is encouraged. While some LEED™ credits can be achieved through the planning phase, most credits are specific to site and building design and are addressed during the design phase. Further discussion of LEED™ is provided in Chapter 9 *Design Consideration and Guidelines.*

4.3 SITE ACCESSIBILITY

4.3.1 External Roadway Network

The Manono Campus is located to the south on the downtown (central) are of the City of Hilo. The Hilo General Lyman Field (airport) is located to the northeast of the campus. Major roadways serving the campus from the north include Kilauea Avenue, Manono Avenue and State Highway 11 (Kanoelehua Avenue) via Lanikaula Avenue. Since the Manono Campus was developed in a residential area over fifty years ago, vehicular traffic is limited by substandard roads by today's standards. It is unlikely that the external roadway network linking the campus will be improved in the near future.

The primary approach to the campus will continue to be Kawili Street. As the Manono Campus is developed it is likely that the County of Hawaii will require the widening and realignment of Kawili Street to provide a turn-in lane to the campus.

4.3.2 Public Transportation

The county-run Hele-On Bus (Hawai'i County Mass Transit Agency) provides service for the Manono Campus. Currently there are several intra-Hilo routes that pass-by the Manono Campus throughout the day, and there are routes connecting Hilo to the major population centers on the Big Island.

The new Manono Campus should include a dedicated transit stop for bus and public transportation. Private automobile or van drop-off and pick-up should be provided from a direct access at the main entrance to the campus, which should allow for temporary and handicapped parking for access to heavily visited sites such as the Student Services Office.

4.4 INTERNAL CIRCULATION, ACCESSIBILITY, PARKING AND LOADING

4.4.1 Internal Circulation and Access

The circulation system must provide vehicular access to all major building groups and facilities on the campus. Since the Manono Campus is near the UH Hilo campus and various Hilo residential neighborhoods, students and faculty who reside in the community would be able to walk or bike to the campus. To accommodate the pedestrian and bicycle traffic, such facilities as walkways, bike paths, and bike racks should be included in the campus layout. Some users may access the Manono Campus via motor bikes, mopeds and motorcycles. Parking facilities for these vehicle types should be provided. Parking, which takes up a considerable amount of space on the campus, is an integral component of the circulation system. See Section 4.2.3 below for a discussion on parking requirements.

4.4.2 Accessibility for the Physically Disabled

The Americans with Disabilities Act Accessibility Guidelines (ADAAG Revised 2004) sets the guidelines for physical accessibility to buildings and facilities by persons with disabilities. These guidelines are applied during the design, construction and alteration of campus buildings and facilities. The State of Hawai'i administers the ADAAG guidelines through the State Commission on Persons with Disabilities. This Commission is part of the DOH. All state and county facilities and projects are subject to ADAAG standards and

review by the Commission. Therefore, provisions must be made for the physically disabled as described in ADAAG and the Hawai'i County Code requirements (Section 25-4-55).

ADAAG requires that the site as a whole be accessible to the physically disabled from major roadways. At least one accessible route complying with ADAAG provisions must be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, and public streets and sidewalks to an accessible building entrance. According to the County Code, the accessible route should have a minimum clear width of thirty-six (36) inches. If vehicles specifically for the physically disabled will service the campus, properly located drop-off and pick-up areas should be designated in the campus circulation plan. Parking stalls should be provided for vans and larger vehicles.

4.4.3 Parking

Currently, there are 511 standard parking spaces and 50 temporary or surge spaces designated on-site for the Manono Campus.

There are two major approaches used to determine the required number of parking spaces for planning future development.

The first approach is the County of Hawai'i minimum parking requirement, which recommends one (1) parking stall for every ten (10) students of design capacity, plus one (1) stall for every 400 square feet of office floor space.[i] Based on this approach and the program requirements described in the Educational Specifications, the minimum campus-parking requirement is three hundred thirty-three (333) spaces for the ultimate FTES load of 2,000.

The second approach is a UH OCI guideline, which recommends a parking ratio of one (1) parking stall for every two (2) FTESs. This standard is based on experience with other campuses in the UH Community College system. Under OCI's standard, the 2,000 FTES campus would have to provide one thousand (1,000) parking spaces. The UH OCI guideline is essentially a goal, as none of the UH campuses meet this standard.

There is wide difference between the two approaches. The County minimum seems too limited, especially since the current campus already has more spaces; while the UH recommendation seems overly generous; especially given the limited terrain available on the Manono Campus parcel.

After discussion and consultation with the Hawaii Community College staff, it was decided that the campus should provide 50 surface spaces and 560 spaces in a parking deck for a total of 610 spaces. This is more than is currently being provided but less than the UH recommended number.

Typically, planners use a factor of 350 square feet per stall to derive the required area for parking located on the surface in a designated parking lot or parking area. This accommodates the stall itself, usually 19 x 9 or 171 sq ft, plus space for entry, exit and internal site access. Therefore, 50 surfaces will require 17,000 sq ft.

The remaining 560 spaces should be accommodated in a parking structure. A three-story structure with a footprint of 55,000 sq ft provides the necessary space.

Among the 610 spaces, stalls for the physically disabled must be provided. The number of stalls should be based on the size and arrangement of buildings, and the requirements set by ADAAG. The paved parking area(s) should be without curbs or curbed with accessible openings.

Parking for fuel-efficient and low-emission vehicles (e.g., hybrids) should be provided. These stalls should be reserved for such vehicles and be given preferential locations. At a minimum, 5 percent of the total parking capacity should be allocated for fuel-efficient and low-emission vehicles if achieving the related LEED™ credit is desired.

4.4.4 Loading

Loading spaces should be located to facilitate deliveries and should be compatible with the overall circulation system of the campus. The number of loading spaces and design of the spaces shall be in accordance with the Hawai'i County Code. The actual number will depend on building layout and square footage.

4.4.5 Emergency Service Access

Access for emergency service vehicles such as ambulances and fire trucks must be considered in designing the overall circulation system for the campus. The campus road system should meet all requirements for road widths and turnarounds based on size and type of emergency and large delivery/maintenance vehicles. Local emergency service requirements should dictate the design of any planned access.

4.5 UTILITY SERVICES

4.5.1 Electricity

Alternative sources of electrical power should be considered and implemented where feasible. Such sources could include wind turbines and photovoltaic's, among other technologies.

4.5.2 Water Supply and Fire Flow

The campus is serviced by an 8-inch County of Hawaii Department of Water Supply (DWS) water main running along Kawili Street. The existing water meter that services the campus is located at the entrance near the intersection of Hinano Street and Kawili Street. The existing fire hydrants should be relocated to a maximum spacing of 300 feet in accordance with DWS standards.

4.5.3 Wastewater

The existing wastewater from the campus is disposed of through the County of Hawaii Department of Environmental Management (DEM) wastewater system running along Kawili Street. There are two points of connection for the campus, one at the main entrance and one at the entrance near the intersection of Kawili Street and Hinano Street. Both connection points are 8-inch gravity sewer mains flowing towards the intersection of Manono Street and Kawili Street. The wastewater ultimately is conveyed to the DEM Hilo Wastewater Treatment Plant.

4.5.4 Gas

A private utility provides limited synthetic gas distribution in the general vicinity of the Manono Campus, and it is unlikely the gas system will be expanded to provide added service to the campus. Actual gas service on campus in the future should be accommodated through on-site gas storage tanks.

4.5.5 Telecommunications

Encased ducts running from the utility corridor in Kawili Street will provide telephone service to Manono Campus. A centralized telecommunications center, which includes a switch room for telephone equipment, should be provided within the campus. Dedicated fiber should run from the telecommunications center to all buildings on the campus. Wireless capability must be incorporated into the telecommunications system.

Hawai'i Interactive Television System (HITS) will be delivered via fiber service to the telecommunications center for distribution throughout the campus. From the telecommunications center, concrete encased duct lines should be installed along the same route as other telecommunications equipment.

4.5.6 Cable Television (CATV)

The Oceanic Time Warner Cablevision system should be extended via underground cables from Kawili Street for CATV service at the site. CATV lines should be distributed to each building from the telecommunications center.

4.6 DRAINAGE AND SITE GRADING

4.6.1 Drainage.

The average rainfall at the campus is approximately 160 inches per year. Grated drain inlets and drywells are used to dispose of storm water runoff at the existing campus. No detectable deficiencies in disposal of storm water runoff are apparent.

4.6.2 Site Grading.

The existing site is relatively flat with slope generally less than 5 percent.

4.7 ENVIRONMENTAL CONTROLS

4.7.1 Ventilation and Air Conditioning

Both passive ventilation and air conditioning should be considered during design. It is recommended that occupant spaces have the option of both passive ventilation and air conditioning with mixed mode controls. Air conditioning is an absolute necessity in "tech" spaces where heat and moisture-sensitive equipment require a controlled environment. Air conditioning could be divided into zones to provide local temperature control to the occupants and reduce energy consumption. Areas such as lounges and dining areas may be naturally ventilated and designed to be continuous with outdoor courtyards and landscaped areas. Natural/passive ventilation may be used during the cooler months and air conditioning may be used during the hotter months to promote a comfortable and consistent learning environment. Passive/natural ventilation will reduce energy costs and promote a healthier educational environment.

Volcanic air pollution (VOG) is a concern for the air quality. MERV 13 filters can capture most particulates; however, they cannot capture gases and aerosols. In order to catch all gases, small particles and aerosols, HyperHEPA and gas media filters would be needed. Pre-cool AC units delivering fresh air into the building have limitations on static pressure. Adding more filters may require adding more pre-cool AC units, which would significantly increase cost. Under "Mixed-Mode" operation (i.e., using natural/passive ventilation during conducive climatic conditions), AC units would be shut down when doors/windows are kept open for natural ventilation. In natural ventilation mode, VOG cannot be addressed by the AC.

Concealed ceiling ducted chilled water fan-coil units (FCUs) are recommended to serve the spaces in each building. This type of system should best accommodate mixed-mode building use and allow for the highest level of individual building zone control.

Different options for the air conditioning systems are discussed in section 7.5 under the Ultimate Mechanical Plan. Designs must be in accordance with the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) *ASHRAE Handbook – HVAC Applications*. Indoor design conditions should be 75°F and 50 percent relative humidity for classrooms, offices and administrative spaces. The use of central pre-cooled handling units (PCUs) is recommended for classrooms & dining areas where high volumes of people require large amounts of outside air. Makeup air intakes should be located to avoid taking in exhaust air and other sources of potential contamination. PCUs should be located in mechanical rooms in each building. Outside air for each building must be in accordance with DOH regulations and ASHRAE 62.1-2007.

All restrooms should be naturally ventilated, window openings shall be provided to comply with the free area of the opening requirements per the sanitation code. In the event that mechanical restroom exhaust is used, exhaust will be sized at 2 cubic feet per minute (cfm)/square foot (sf) where makeup air is drawn from air-conditioned areas, and at 4 cfm/sf where makeup air is drawn from unconditioned areas.

4.7.2 Lighting

Interior lighting throughout the campus should use the most efficient source available. Classroom, offices, support areas and corridors should use fluorescent T-8 lamps with electronic ballast. Where down lighting is desirable, compact fluorescent type luminaries can be utilized. Dimmable ballasts in conjunction with the fluorescent base sources should be used in rooms that require varying levels of lighting. In HITS rooms, directional luminaires could utilize quartz-based lamps. Consideration should be given to maximizing the use of natural day lighting.

4.7.3 Noise Control and Acoustical Treatment

The campus is located in a residential/light industrial area and from time-to-time is subject to noise disturbances. Noise contours indicate that airport noise at this distance is fairly low and should not create a long-term negative impact for the campus. The campus is located sufficiently far from major roads and highways. As a result, the noise from motor vehicles should not be of great concern.

Noise generating equipment such as generators and heavy equipment activities (albeit a perceived temporary source of noise impacts) as well as mechanical and electrical control rooms should be situated away from classrooms and offices. These potential noise sources should also be sited upwind from quieter areas to minimize noise disturbance. Mechanical noise generating equipment such as chillers, cooling towers, air handlers and exhaust fans should be provided with sound attenuation. Noise in interior occupied spaces should be attenuated as follows:

- Classrooms, Offices, Lounges and Conference Rooms – 35 Noise Control (NC)
- Storage and Restrooms – 45 NC
- Parking and Workshops – 55 NC

Exterior noise from mechanical equipment should be limited to a maximum of 75 dbA at a distance of 25 feet from the equipment.

Concrete and masonry is recommended as the basic construction materials for campus buildings. Concrete and masonry have excellent noise isolating properties. Since the campus is planned to be air-conditioned throughout, selection and design of windows and openings should consider noise transmission from adjacent activities.

Interior building noise can be attenuated with acoustical insulation materials and assemblies. For example, interior noise traveling from room to room can be attenuated by the use of partitions extending past the ceiling to the underside of the roof structure. Sound attenuation blankets in cavity walls will also decrease sound transmission. The strategic placement of landscaping can also be used to minimize noise transfer from exterior to interior areas.

4.8 SECURITY AND SAFETY

4.8.1 Security System

A central security system is recommended for the campus. The main equipment should be located in the same room as the fire alarm control panel and will be similar in topology as the fire alarm system. Each building should have a sub-panel that will communicate with the main panel. Key rooms (e.g. main telecommunications room, computer laboratory, etc.) and building entrances should be monitored. A mass notification system should be considered as part of the security system.

4.8.2 Fire Alarms and Detectors

The campus should incorporate a centralized fire alarm system. Each building should have its own control panel, pull stations, speakers, ADAAG flashers, smoke detectors, heat detectors, duct detectors and required sprinkler monitors. Each building should be connected back to the central fire alarm panel. The main panel and the satellite panels should be capable of communicating with each other. The system should be fully addressable and electrically supervised. There should be a separate duct line and hand hole system installed throughout the campus to facilitate interconnection of the system components.

4.8.3 Security Fencing

To enhance the appearance of an open campus, it is recommended that the use of security fencing, such as chain link or barbed wire, be kept to a minimum. Where security fencing is essential (e.g., open areas with sensitive equipment or hazardous materials), aesthetically designed rock walls or plant-covered fencing should be utilized.

4.8.4 Railings and Gates

Railings will be required under the various life safety codes to prevent falls, to aid the physically disabled on ramps and to direct pedestrian traffic. Although these are a functional necessity, railings can be selected and designed to be aesthetically pleasing. Design guidelines that encourage continuity of aesthetic elements such as railings should be followed throughout the campus. Instead of the standard picket railing system, fences can be designed with a repeatable motif in appropriate materials and colors to create a Hawaiian theme.

As with fencing, gates should be minimized to create an open campus theme. Gates are necessary to allow access to fenced areas such as archaeological sites. The design of gates should follow the motif set for fencing.

Welded steel fencing, railings, and gates that are properly galvanized and painted offer the best material for flexibility and expression of design motifs. Aluminum does not have the flexibility or choice of color that steel has, but may be selected as an alternative building material. Wood lacks durability and requires more maintenance. Where visual security and surveillance is not critical, rock walls can be designed and constructed in lieu of fences and railings. Rock walls used selectively can relieve monotonous runs of fencing and railing.

4.8.5 Night Lighting

Exterior lighting must comply with the Hawai'i County Ordinance 92-01, which requires all exterior luminaires to be fully shielded and to utilize low-pressure sodium lamps. All roadways, parking lots, and pathways must be illuminated for nighttime safety and security. Building perimeters should be tastefully illuminated with shielded low-pressure sodium luminaires.

4.8.6 Emergency Telephone

Security phones, clearly marked, should be located in various key locations throughout the campus. Phones should be free standing.

4.8.7 Fire Protection

The County of Hawaii Department of Water Supply, Water System Standards requires a fire protection system that has the capacity to dispense 2,000 gallons of water per hour for two hours with a minimum residual pressure of 20 pounds per square inch. Fire hydrants are required to be spaced at a minimum of 300 feet apart.

4.9 VISUAL CONTROL

In order to protect and increase the natural and aesthetic views both from and off the campus, planning should consider open view vistas and the avoidance of a severe streetscape.

4.10 PLANNING CRITERIA

In addition to the foregoing detailed planning considerations the following planning criteria were established from interviews and discussions with HawCC faculty and staff. They are framed as questions and will be used later to evaluate alternate plans and select the Ultimate Site Plan

Does the plan…

- Move all programs to Manono Campus?
- Provide resources for 21st century programs?
- Allow for future expansion?
- Implement LEED Silver or better?
- Promote walkability and pedestrian circulation?
- Ensure compatibility with surroundings?
- Have a favorable, positive impact when seen from surrounding streets?

5.0 SITE UTILIZATION

In most campus planning scenarios the project parcel is larger than the building site. In these situations it is necessary to examine alternative building sites and make a determination as to which building site best meets the needs of the project. This was the case in the Komohana LRDP [1], [4] and the UH Center-West Hawaii LRDP [9]. In both, planners identified three building sites within the project parcel, established criteria and selected the preferred building site.

This approach is not applicable in the Manono Campus situation because of the relatively small size of the parcel, approximately 20 acres, as compared to the list of educational and functional requirements, including

- Learning and associated functional spaces to accommodate the 2,000 Ultimate FTES load.[8]
    - 56 Classrooms
    - 26 Class Labs
    - 21 Shops
    - 13 Yards totaling approximately 41,900 gross sq ft
- Office space for a staff and faculty headcount of 272 [8]
- Parking for 610 vehicles
- Numerous other planning requirements

As a result, it will be necessary to use the entire planning parcel as the "Preferred Site Utilization Scheme" for the building site, as was done in the 1998 Manono Campus Study [3]

[This page intentionally left blank]

6.0 ALTERNATIVE SITE PLANS

6.1 GENERAL

In this section, previous information is used to develop three (3) alternative site plans, which are organized around key design "building blocks" essential to the campus. These building blocks relate to the planning considerations and planning criteria discussed in Chapter 4 and include:

- Site proximities and opportunities
- Edges, entries and gateways
- Buildings and their functional siting
- Plazas and open spaces
- Pedestrian circulation
- Vehicular circulation and parking areas
- Service needs.
- General landscaping

Within the framework of the "building blocks," the design team identified features that should be common to all the Alternative Site Plans.

6.1.1 Site proximity and opportunities

- Proximity to Hilo Airport.
- Adjacencies to University of Hawaii Hilo campus, Waiakea High School, and Hilo Nursery & Arboretum.
- New campus design could be used as a catalyst to potential to develop the area into a college town/educational core.

6.1.2 Edges, entries and gateways

- Reconfigure the North Campus Entry resulting from the Kawili Street Realignment. The northern edge becomes the linkage to the potential development of the college town/educational core.
- Reconfigure and enhance the existing entry from Kawili Street as the most convenient and appropriate site for the main entry and gateway to the campus.
- Improve access by redesigning the North Campus Entry and adding additional entryways on the east and south.
- Use setbacks and roadways to recognize and accommodate the existing residential "edge" on the west and light industrial "edge" on the east

6.1.3 Buildings and their functional siting

- Combine administrative and teaching spaces in larger footprint buildings to improve services to students, promote institutional cohesion and improve efficiency.
- Develop campus areas or zones by function
    - Use academic support facilities as a visual gateway to the campus and a direct connection to students, administration, staff and the larger community and consolidate the delivery of services to students to promote "one-stop" shopping for services and academic support.
    - Use the middle campus area for core academic facilities and student-to-student and student-to-faculty interaction.
    - Separate shops and industrial uses from administrative and traditional classroom instructional areas to better manage noise and light industrial type activities.

6.1.4 Plazas and open spaces

- Provide a large "Marae/Piko" entry plaza.
- Maximize views to Mauna Kea.
- Use buildings and site elements to organize open spaces into courtyards and commons (outdoor covered areas) to promote a sense of community and provide natural settings for students, faculty and staff to congregate.

6.1.5 Pedestrian circulation

- Direct vehicles to the campus periphery and provide unimpeded pedestrian access to all campus activities.
- Provide covered walkways.
- Use the pedestrian pathways to promote a sense of purpose and organization to the campus activities and functions.

6.1.6 Vehicular circulation and parking

- Relegate cars to the edge of the campus by providing perimeter roads and limited surface parking stalls.
- Provide easy and efficient access for service and emergency vehicles to all parts of campus.
- Use a multi-deck parking structure to consolidate longer term parking needs to a single location.
- Minimize surface parking and redirect it for short-term uses.

6.2 ALTERNATIVE SITE PLANS 1-3

The plans, which are drawn to scale and shown in Figures 6-10, differ in their approach to the number and height of buildings, the integration of functional and parking requirements and the siting of the shops currently located on the UH Hilo Campus.

6.2.1 Alternative 1

This alternative groups functions and activities into fourteen buildings. Yards and parking are separate. All activities are relocated to the Manono Campus.

6.2.2 Alternative 2

This alternative also groups functions and activities into fourteen buildings, but in a different arrangement to facilitate a combination of program spaces and parking. The combined structure provides an efficient use of scarce surface space. Yards remain separate. All activities are relocated to the Manono Campus.

6.2.3 Alternative 3

This alternative employs the same organization of buildings as in Alternative 2; however the Applied Technical Education programs and yards housed at the UH Hilo Campus are not relocated. Instead, they remain at UH Hilo or potentially placed on a new parcel located adjacent to the Manono site.

6.3 SURFACE SPACE REQUIREMENTS FOR ALTERNATIVES 1-3

Table 5 shows the square footage of the footprints for the buildings, parking and yards of the three alternatives.

Table 5
Alternative Site Plans

	Footprint (sq ft)		
	1	2	3
A, 1-Story, Carp + Constr Acad	20,845	20,845	20,845
B, 1-Story, EMIT + Electronics	15,650	15,650	15,650
C, 1-Story, Plgn, Ops & Mnt	9,801	9,801	9,801
D, 1-Story, Upper Shops-ABRP	17,603	17,603	
E, 1-Story, Upper Shops-AMT	20,518	20,518	
F, 1-Story, Upper Shops-DIMC	16,885	16,885	
G, 1-Story, Upper Shops-WSMM	21,230	21,230	
I, 3-Story, Admin + LA&PS	16,214		
J, 3-Story, C&T + Culinary	19,921	19,921	19,921
K, 3-Story, English + Math/Sci	20,411	20,411	20,411
L, 3-Story, Humanities	13,055	13,055	13,055
M, 3-Story, Learning Commons	12,526		
N, 3-Story, Student Services	19,228	19,228	19,228
O, 3-Story, LA&PS, Soc Sci, Early Childhood		10,210	10,210
P, 1-Story, Combined Parking & Other		55,592	55,592
Z, 2-Story, Hale Aloha	8,318	8,318	8,318
Total	**232,204**	**269,265**	**193,030**
Yards, gardens, Early Childhood playground, etc.	41,900	41,900	23,900
Parking, separate 3 level structure	55,592		
Grand Total	329,696	311,165	216,930

The table reflects the impact of combining parking with other uses and the decision to not relocate the off-site, "Upper Shops" to the Manono Campus.

The parking impact is shown in line, "P" in which, under Alternative 1 there is no combined structure and parking is shown separately with a footprint of 55,592 sf for a three story structure. Alternatives 2 and 3 show the combined structure with a footprint of 55,592 sf and no separate line item for parking. In concept, three stories of parking are combined with one story of functional space – all in a footprint of 55,592 gsf. There is a saving of almost 17,000 gsf of footprint. The savings are not one-for-one because of the effect of moving spaces from a three story building for functional spaces to what is in-effect a building with one story for functional space.

The impact of not relocating the shops to the Manono Campus is reduction in required building footprint of 76,236 gsf.

6.4 COMPARISON OF ALTERNATIVES AND SELECTION OF PREFERRED SITE PLAN

The alternatives were evaluated against the planning criteria, which had been previously developed.

Table 6
Comparison of Alternative Site Plans

Criteria	Alternative 1	Alternative 2	Alternative 3
Move all programs to Manono Campus?	Yes	Yes	Yes, if additional space acquired
Provide resources for 21st century programs?	No	No	Yes
Allow for future expansion?	No	No	Yes
Implement LEED Silver or better?	Yes	Yes	Yes, less density will provide more flexibility in meeting requirements
Promote walkability and pedestrian circulation?	Limited by building requirements	Limited by building requirements	More space provides better walkability and circulation
Ensure compatibility with surroundings?	Building density and mass dominate adjacent residential areas	Slightly better but will still dominate adjacent residential areas	Less density and more open space will fit better with adjacent residential areas
Have a favorable, positive impact when seen from surrounding streets?	Streetscape appears as an unbroken wall of buildings	Streetscape appears as an unbroken wall of buildings	Arrangement of buildings and open spaces provides sense of coherence and organization

Alternative 3 is the preferred choice even though it does not accommodate all programs on the Manono site. Given the size and configuration of the parcel, it does not appear advisable to attempt to "shoehorn" all the programs into the available space. Alternatives 1 and 2 attempt this and the results are cramped spaces and inappropriate space devoted to shops and yards for Applied Technical programs.

Alternative 3 is much less crowded, enabling the campus to be designed with a more inviting appearance and the look of an important 21st century community asset. There is also some opportunity for future expansion especially if additional space on the east side of the campus is made available by the State Department of Transportation or Department of Hawaiian Homelands.

During an update and evaluation meeting, University of Hawai'i and Hawai'i Community College officials selected Alternative 3 for further development as the Ultimate Site Plan.

[This page intentionally left blank]

Figure 6
Program

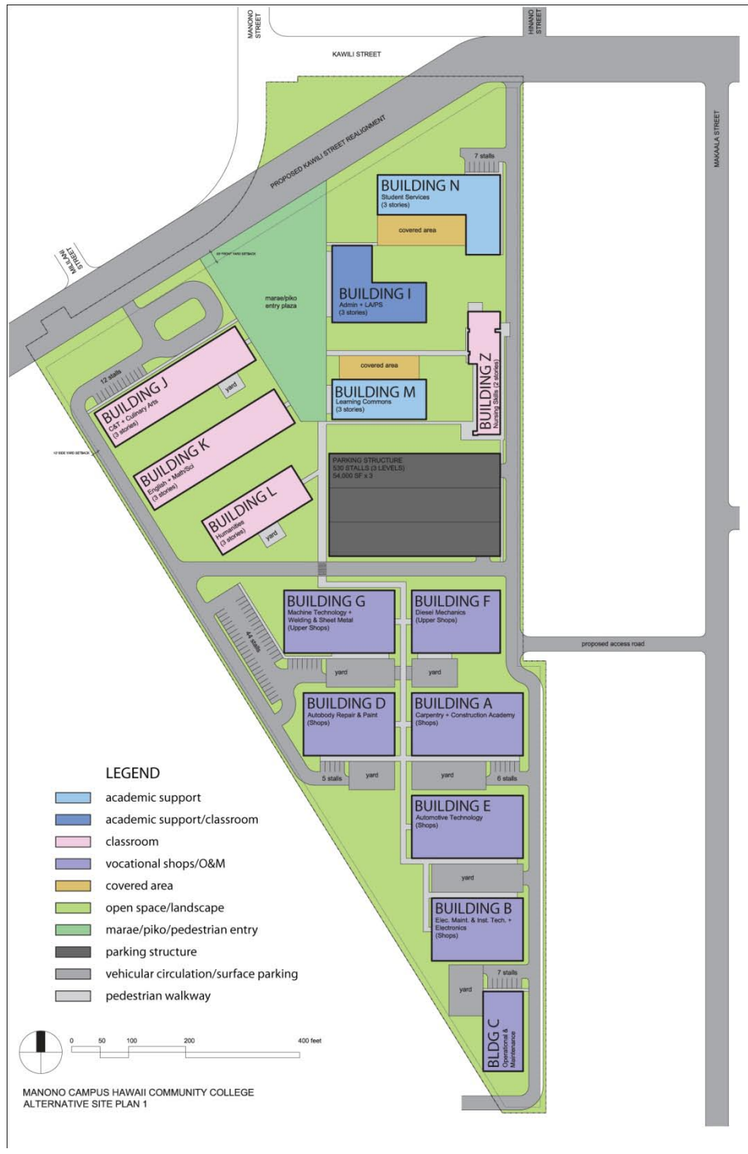


Figure 7
Ground

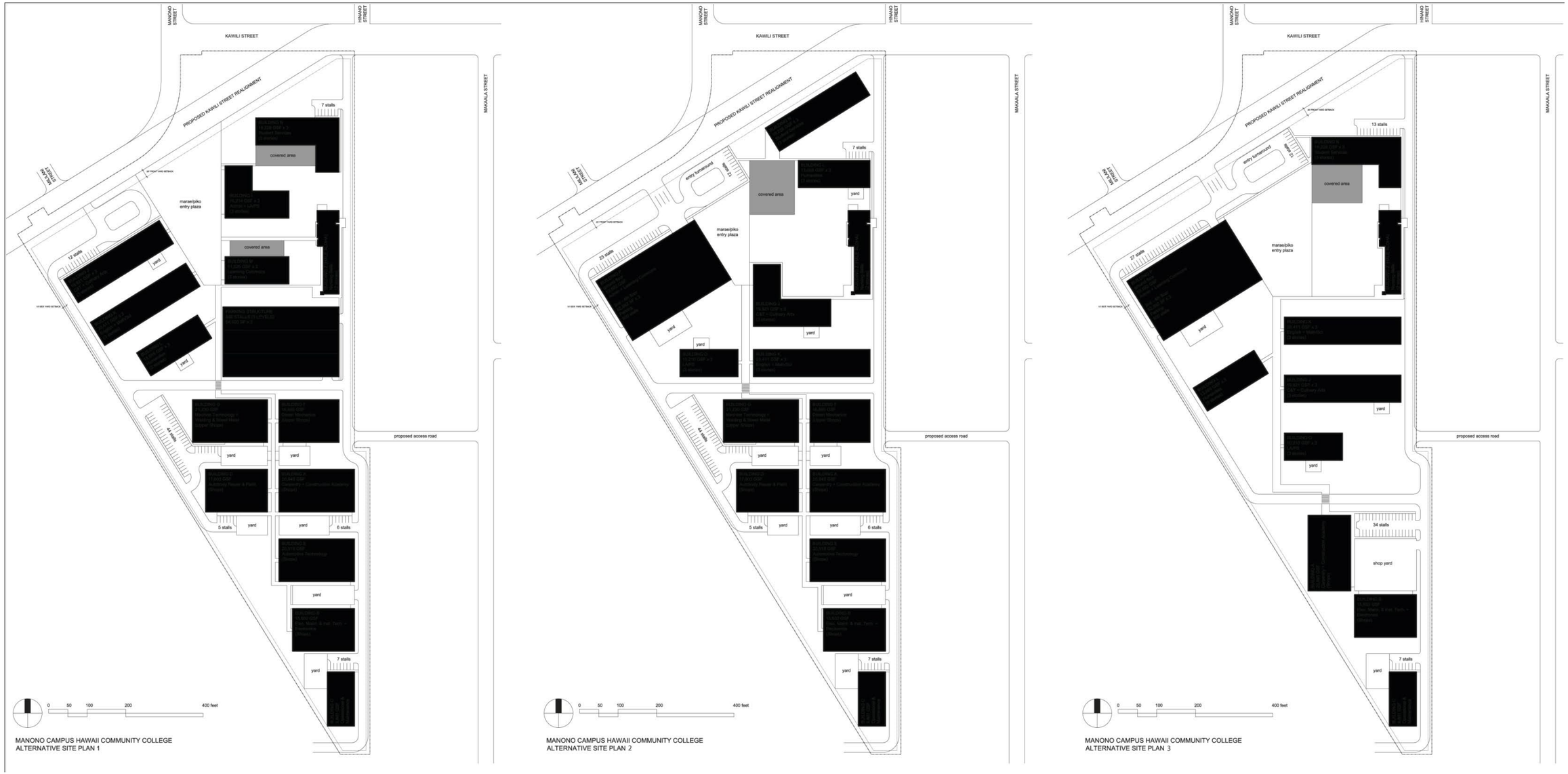


Figure 8
Open Space

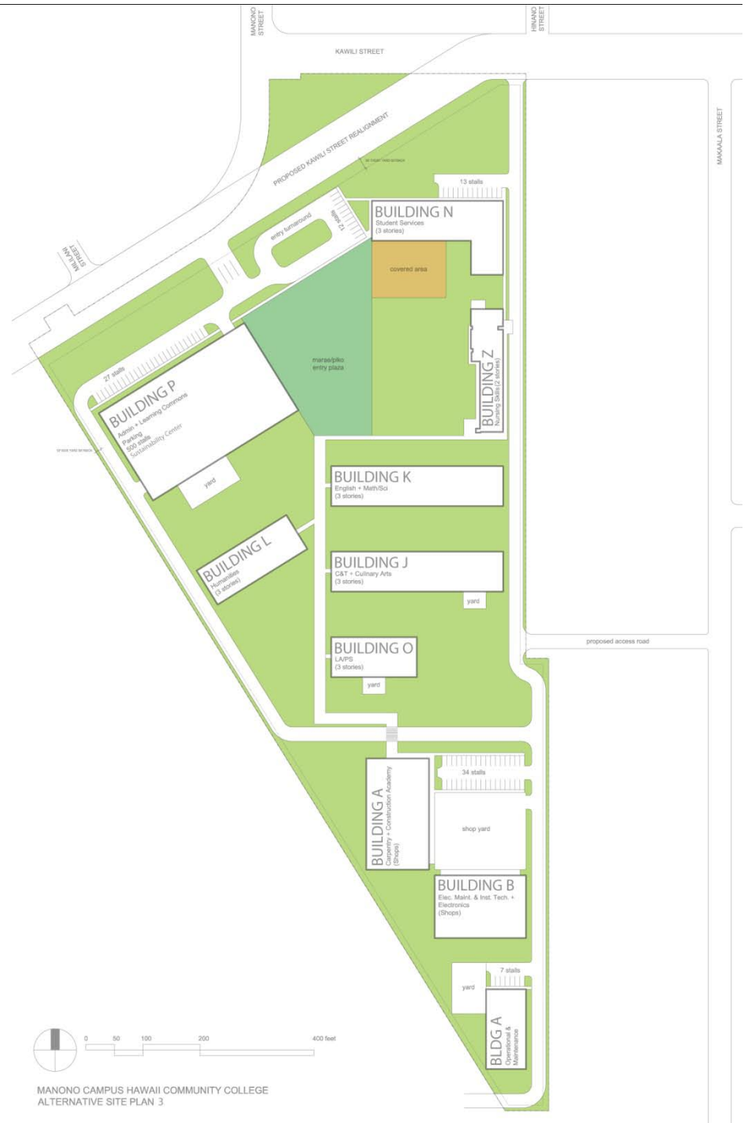
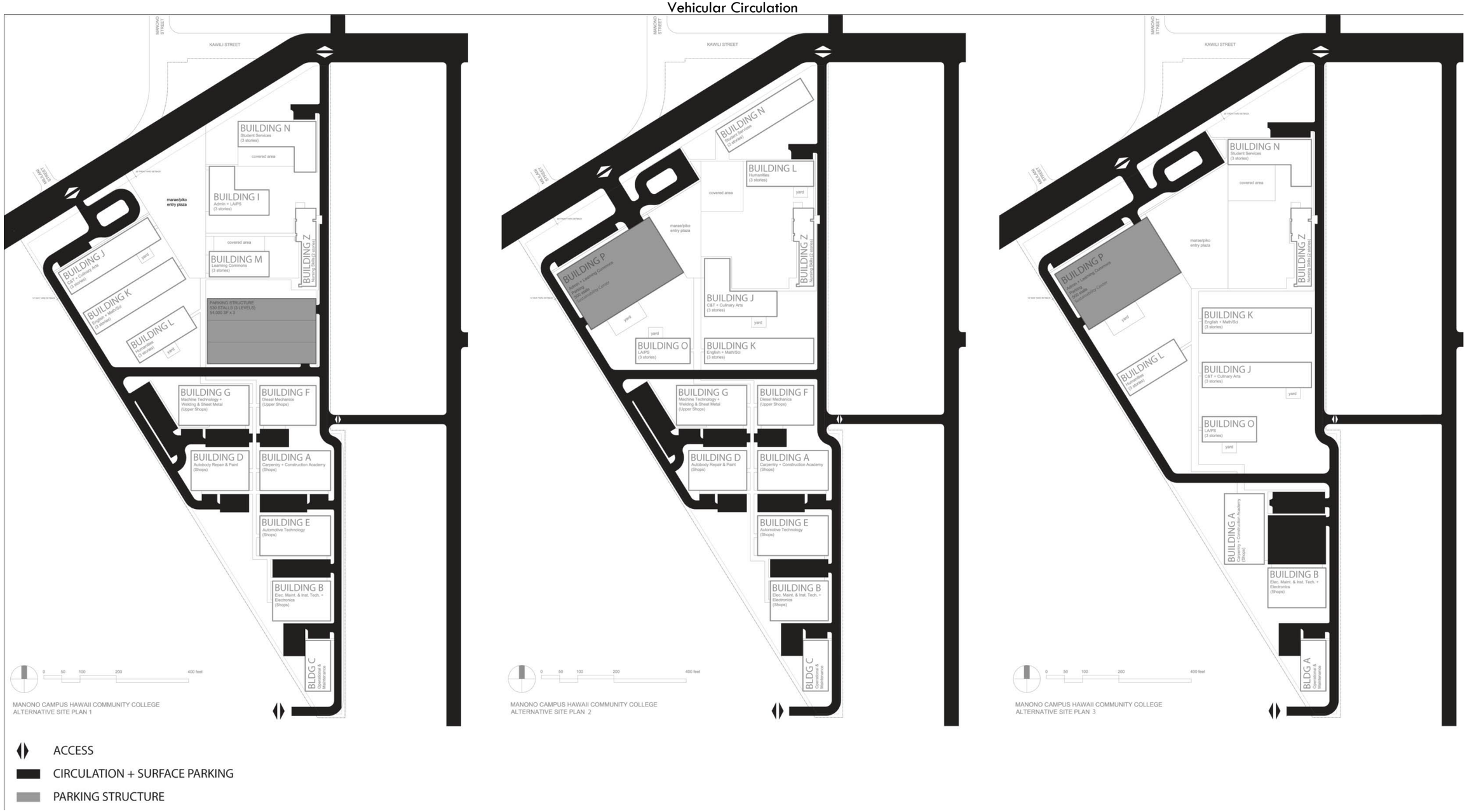


Figure 9
Pedestrian Circulation

Figure 10
Vehicular Circulation



[This page intentionally left blank]

7.0 ULTIMATE SITE PLANS

7.1 ULTIMATE SITE PLAN

The Ultimate Site Plan, Figure 11 is based on Alternative 3 from the previous section. It includes some modifications based on discussions and comments that surfaced during the evaluation process.

7.1.1 Edges, entries and gateways

The main entrance to campus will be from the realigned Kawili Street. The Administration/Academic Support building and Student Services building flank the entryway which flows into the Marae/Piko Plaza forming a gateway to the campus interior.

The campus entry/gateway is enhanced by a traffic turnaround that will enable visitors to make short visits to the administrative offices, for admissions or financial assistance or be redirected to a parking structure for more extended stays.

A perimeter road complex defines the campus helping to distinguish it from residential properties along the western edge and light industrial activities on the eastern edge.

Additional access is provided by two new entries on the south and east and one redesigned entry on the north end of campus.

7.1.2 Buildings and their functional siting

Appendix A shows the assignment of functions and programs to buildings.

Campus administration, academic support and student service functions are located in the main entry area to facilitate access and help preserve the campus interior for academic activities.

The academic core radiates south from the Marae/Piko Plaza in a group of large footprint, three story buildings. The buildings combine learning spaces with faculty and staff offices to provide a rich and supportive academic setting. The buildings are sited, for the most part, along an east-west axis to provide the best available natural lighting for interior spaces.

The buildings form natural courtyards and commons (outdoor covered areas) providing easy access across campus and offering natural settings for students, faculty and staff to congregate.

The vocational technical shops, campus maintenance facilities and their associated yards are located south of the mid-campus road in a separate area from the academic core to alleviate the noise and pollution natural to vocational shops.

7.1.3 Plazas and open spaces

The campus gateway includes a large Marae/Piko Entry Plaza for welcoming visitors and for campus gatherings.

On the campus interior, buildings and site elements are used to organize open spaces into a number of courtyards.

- "Mauna Loa Courtyard" defined by Bldg J, the Academic Commons, Bldg K and the Pedestrian Covered Walkway.
- "Mauna Kea" Courtyard South and North defined by Bldg, K, the Hale Aloha Building, the Marae/Piko Entry Plaza, Building L and Building N.
- "Children's Courtyard," a triangle defined by Bldg O, the Pedestrian Covered Walkway and the West Perimeter Road.
- "Central Courtyard," defined by the West Perimeter Road, Bldg P, the Pedestrian Covered Walkway and Bldg O.

7.1.4 Pedestrian Circulation

The primary and secondary entryways direct vehicles to the perimeter roads and the campus periphery providing pedestrian's unimpeded access to all campus activities. The Pedestrian Covered Walkway provides primary and secondary pedestrian walkways with overhead cover.

The Pedestrian Covered Walkway is an organizing element that provides unimpeded views from Marae/Piko plaza along the core campus to the shops area.

7.1.5 Vehicular Circulation and Parking

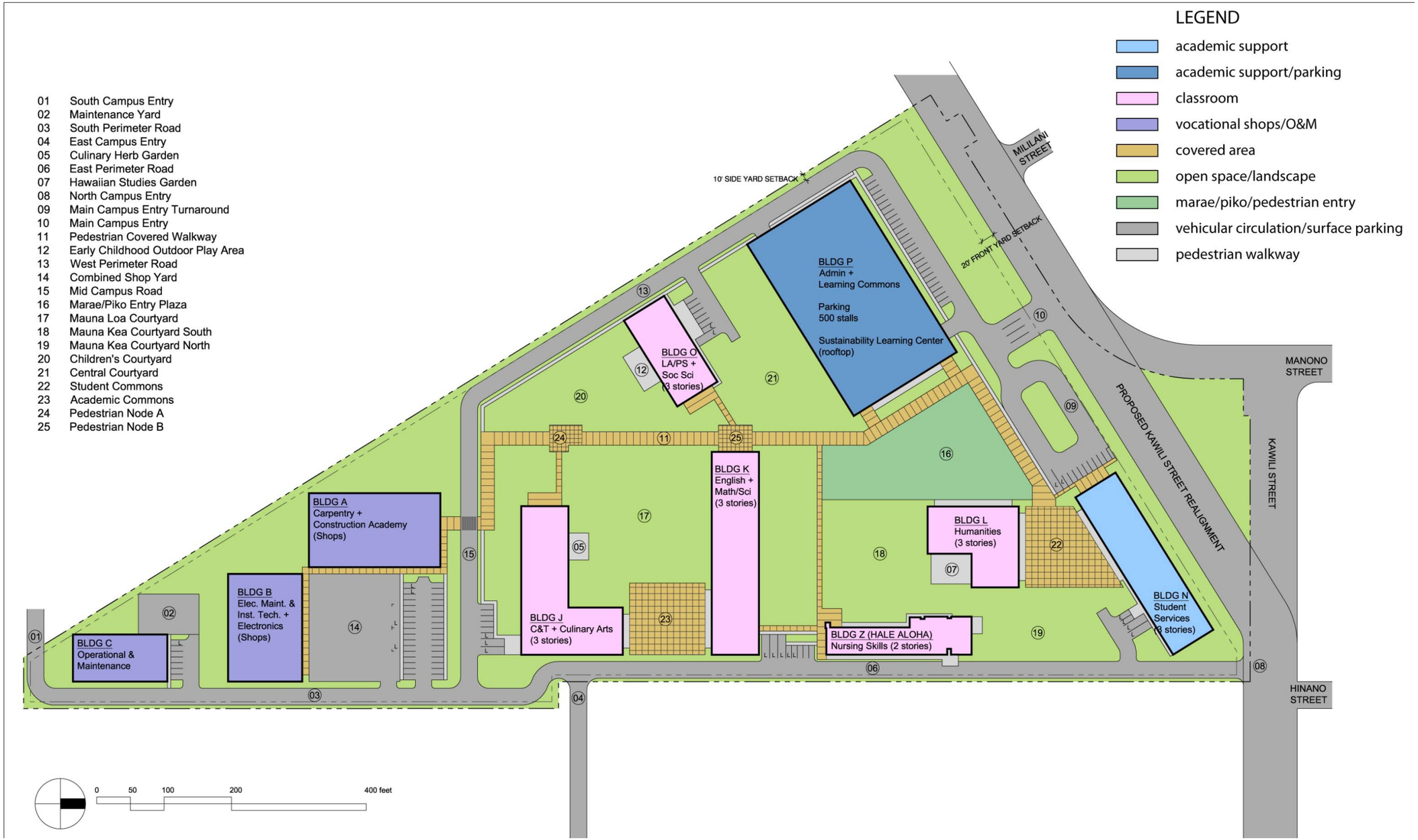
Vehicles are relegated to edge of the campus along three perimeter roads, which are connected by a single Mid Campus Road. This maintains the pedestrian friendly feel of the core campus while providing easy and efficient access for service and emergency vehicles to all parts of campus.

There is a multi-deck parking structure which consolidates longer term parking to a single location while minimizing surface parking and redirecting it for short-term uses.

7.1.6 Notional 3D Views

Figures 12 and 13 provide 3D views of the Ultimate Site Plan. None of the buildings have been designed. The architecture is notional and intended to suggest how the site elements tie together providing an integrated plan.

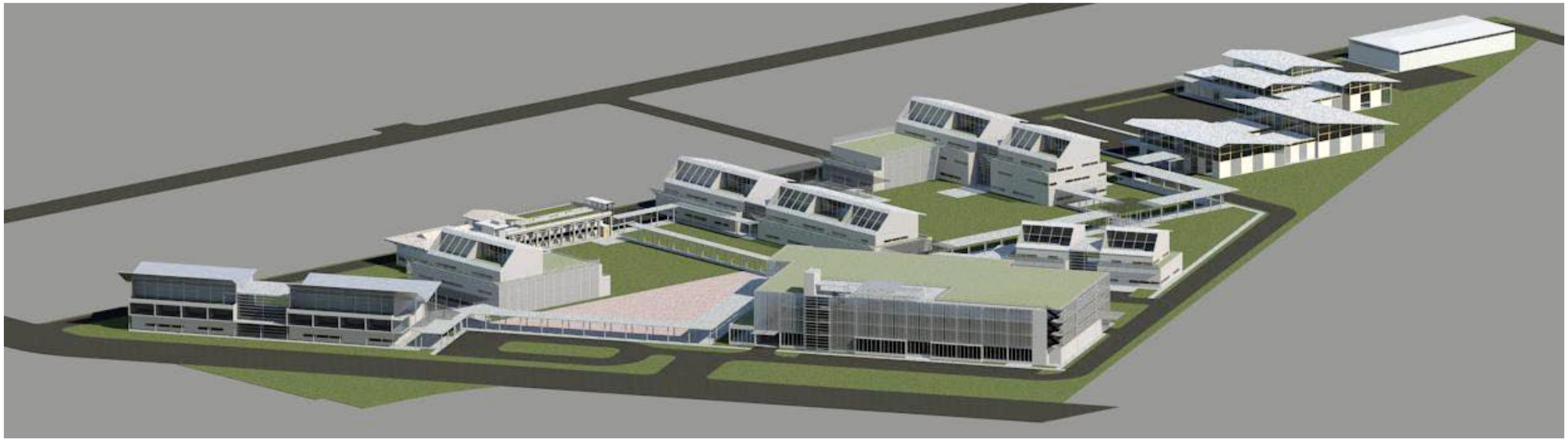
Figure 11
Ultimate Site Plan



[This page intentionally left blank]

Figure 12
Notional 3D Views

Northwest Perspective



Campus Entry

[This page intentionally left blank]

Figure 13
3D View from Marae Piko

[This page intentionally left blank]

7.2 ULTIMATE LANDSCAPE PLAN

7.2.1 Existing Conditions and Factors Affecting Development of the Campus Landscape Plan

The developed portions of the current campus are sparsely vegetated with a variety of local species. There are few mature trees. The undeveloped portions of the campus are mostly open, grassy or dirt areas.

The topography is relatively flat with an average slope of less than one percent.

Hilo's rainy climate poses an opportunity for developing a lush, tropical campus setting with a variety of plantings. While this climate reduces the need for costly irrigation systems, a temporary irrigation system will need to be provided during the plant establishment period.

7.2.2 Landscape Plan Concept

The Landscape Plan reinforces the building blocks established in the Ultimate Site Plan by setting the campus in a natural "Hawaiian Garden." The plan uses a plant palette consisting of selected native, Polynesian introduced and appropriate non-native plants commonly used in Hawaii. The landscape plan along with the building and circulation layout will create a special sense of identity that is uniquely representative of Hawaii CC. The plan as depicted in Figure 12 establishes a theme and pattern for an organized and cohesive campus.

Successful implementation of the landscape plan should strengthen the relationship of the various site plan elements. The use of consistent paving, street furniture, lighting, and plant material should provide a common thread, which will help to create a greater sense of place and tie the campus together.

A Plant List for the various plants recommended for each of the elements described below is presented in Table 7.

7.2.3 Edges, entries and gateways

Edges

The perimeter planting concept for Manono campus is to develop an edge for the campus to create a sense of identity and define the boundaries of the campus. These plantings would also serve to buffer the campus from adjacent land uses. Without a landscape buffer, campus features and buildings will be highly visible from the adjacent properties.

Flowering canopy trees such as Koa, Queen's White Shower and Royal Poinciana and native Hawaiian trees such as Thornless Hala, Kukui, Koai'a, Naio, Lama, Kou and Milo will be planted along the western and eastern campus edges.

Entries

Large canopy trees such as Monkeypod and True Kamani will be used to define the main entry along the proposed Kawili Street Realignment. Niu (Coconut palms) or native Loulu palms (*Pritchardia* martii) are proposed to define the turnaround and serve as a visual transition to the Administration, academic support and main parking complex.

The East Campus Entrance is considered to be the back entry to the campus, but should also be treated as a main entry. The drive should be lined with a double row of flowering canopy trees, which would also serve to screen the surface parking lot and shop complex to the south. Entry walls and signage should be constructed at this entry also.

Gateways

Gateways are signage features provided at key intersections which serve to welcome visitors to the campus. These elements should be defined through the consistent use of rock walls, signage, lighting, and landscaping. Ferns, grasses and groundcovers should be planted to accent the gateways. Gateways are proposed at each of the four entries.

7.2.4 Buildings

Native Hawaiian, Polynesian introduced and flowering canopy trees will be planted around buildings to soften facades, mask massing, provide shade and add visual interest and variety.

7.2.5 Plazas and open spaces

To better organize and define spaces on campus, a hierarchy of open spaces has been established for the campus. The hierarchy is based on the function and activities which occur within the various open spaces on campus and is as follows: 1) the Marae/Piko entry plaza, 2) pedestrian nodes, 3) the courtyards, 4) Culinary Herb Garden, 5) Hawaiian Studies Garden, 6) Early Childhood Outdoor Play Area and 7) other open spaces. Each of the open spaces and their various functions are described below.

The Marae/Piko Entry Plaza

The Marae/Piko entry plaza will be used as a gathering area for large functions. At the corner of the plaza, adjacent to the Student Services Building, there will be a covered space to provide shelter and accommodate various student activities and functions. The remaining corners will be landscaped with Niu and native Loulu palms with grassing below to allow for activities on the lawn and for maximum flexibility. Special paving material is recommended for this plaza.

Pedestrian Nodes

Pedestrian Nodes should be located at the major intersections along the covered walkways. These nodes would be mini-plazas and should have a special pavement treatment, site furniture, information kiosks, trash receptacles, lighting, consistent signage, and accent landscaping.

The Courtyards

Courtyards would be defined by the formation and design of buildings and are identified on the Ultimate Site Plan. For example, the Hale Aloha Building, Bldg L and Bldg K form three sides of one of the courtyards. The fourth side is formed by the Pedestrian Covered Walkway.

A bioswale of native Hawaiian and Polynesian introduced shrubs and ground covers such as ʻAeʻae, ʻApe, ʻAhuʻawa, Makaloa, Puʻukaʻa, ʻUki, and Kalo will meander throughout the campus to not only reinforce the Hawaiian Garden concept but to intercept surface runoff where silt and pollutants can be removed and the water collected underground and stored for irrigation.

In addition, the Courtyards will be generously planted with native Hawaiian and Polynesian introduced trees, similar to those that are planted along the campus boundaries.

Culinary Herb Garden

The Culinary Herb Garden on the south side of Bldg J is part of the culinary program and needed to provide fresh herbs and plant seasonings to supplement the cooking curriculum.

Hawaiian Studies Garden

The Hawaiian Studies Garden is part of the Hawaiian Studies program and proposed to be located adjacent to Bldg L. This garden should provide both educational, as well as aesthetic value. The garden should consist of plants which are used by native Hawaiians for food, medicine, religious purposes, and cultural practices. The plants in this garden may also be identified with plaques with the appropriate information.

The garden may be enclosed by a low-rise lava rock wall, which would be planted with ferns and native grasses.

Early Childhood Outdoor Play Area

The Early Childhood Outdoor Play Area is an integral part of the Social Sciences Early Childhood Education Program and is proposed to be located on the south side of Bldg O. The play area will have some playground equipment and be enclosed by a fence for safety and security. Substantial ferns and flowering shrubs will be used to screen the fence and help to further define the children's play area.

7.2.6 Pedestrian Circulation

The "spine" of the Pedestrian Covered Walkway provides unimpeded views from the Marae/Piko Plaza along the core campus to the shops area providing a sense of purpose and organization to the campus activities and functions.

The "spine" will intersect at points with the courtyard walkway. These intersections will see heavy concentrations of native Hawaiian and Polynesian introduced trees, which will add variety and visual interest.

There will be openings in the tree planting to provide views from the "spine" to Mauna Kea.

All parts of the pedestrian covered walkway should be enhanced with lighting (for safety); consistent paving patterns/paving materials, rest areas supplemented with site furnishings, uniform (seating, drinking fountains, information kiosks, planters, trash receptacles, etc.) and consistent signage.

7.2.7 Vehicular Circulation and Parking

The entry drives and the internal service roads will serve as the primary roadways on the campus. To articulate these roadways as primary circulation routes, the landscape plan shows the use of consistent planting material, which includes palms along the main entry and canopy trees in the landscape areas adjacent to the sidewalk. Other roadways on campus can be landscaped with informal groupings of flowering canopy trees and palms.

The parking lots should be landscaped with canopy trees such as the native true K*ou (Cordia subcordata)* to reduce the amount of exposed pavement by creating shade and visual screening. Besides providing functional and aesthetic benefits, the trees will also create a better experience for the user by providing a strong sense of progression and organization from the entry to the parking lot. The specialty parking areas would be landscaped with informal groupings of flowering canopy trees.

7.2.8 Maintenance, Service and Utility Screening

Maintenance and service areas should be screened through the use of hedges, and densely planted trees. Utilities (electrical transformers) and dumpsters shall be screened through the use of hedges, opaque fences, and walls. Screening vegetation, fences and walls for maintenance, service and utilities are discussed in the Design Guidelines.

Figure 14
Landscape Plan

[This page intentionally left blank]

Table 7
Landscape Plant Palette


Thornless Hala - indigenous, leaves used for making mats


Kukui - polynesian introduction, fruit husk and bark root used to make beige and brown/red dyes


Koai'a - endemic, wood used to make fish hooks and beaters


Naio - indigenous, wood used for house construction, making nets and torches for night fishing


Lama - endemic, wood was used to make fish traps and when pulverized used to treat skin ailments

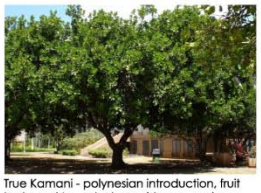

Kou - polynesian introduction, leaves used to make brown dye


Koa - endemic, wood used for canoe paddles and surfboards


Queen's White Shower


Royal Poinciana


Monkeypod


True Kamani - polynesian introduction, fruit husk used to make brownish mauve dye; sap added to dye for perfume


Niu - polynesian introduction, trunk used to make pahu hula, shell used to make puniu (knee drum) & 'uli'uli (rattle)


Milo - polynesian introduction, fruit wall used to make yellow/green dye, wood used to make food containers


Native Loulu - endemic, leaves used for plaiting


'Ohi'a lehua - endemic, buds and flowers used to decorate hula altars


Hapu'u - indigenous, used to treat sinuses


Palapalai Fern - indigenous, fronds used to decorate hula altars, symbolic of Hi'iaka


Kupukupu Fern - indigenous, used to decorate plaited lauhala and for lei making


'Uki'uki - indigenous, leaves were braided to serve as cordage; fruit used to make dark purple dye


Ti - polynesian introduction, leaves used to make rain capes and sandals; fibers used for cordage


'Ae'ae - indigenous, creeping succulent with bright green leaves and small lilac flowers


'Ape - polynesian introduction, corms eaten during famine


'Ahu'awa - indigenous, stems stripped; fibers utilized for cordage and stems used for turtle nets


Makaloa - indigenous, stems used to to create highly prized mats


Pu'uka'a - endemic, endangered sedge


'Uki - indigenous, sedge used in cordage


Kalo - polynesian introduction, primary food source of Polynesians; raw scrapings of corm used to make oral medication

[This page intentionally left blank]

7.3 ULTIMATE CIVIL PLAN

7.3.1 Drainage and Site Grading

The average rainfall at the campus is approximately 160 inches per year. Grated drain inlets and drywells are utilized to dispose of storm water runoff at the existing campus. No detectable deficiencies in disposal of storm water runoff are apparent.

The proposed site will utilize the same drainage system consisting of grated drain inlets and drywells. See Figure 13. The existing drywells will remain in use wherever possible. New drywells will be subject to State of Hawaii Department of Health (DOH) , Safe Drinking Water Branch Underground Injection Control (UIC) permitting. The UIC permitting process may include the need to publish a public notice of the intent to utilize drywells or injection wells at the site to dispose of storm water runoff. Closing of existing drywells that will no longer be in use will be subject to DOH UIC Instructions to Abandon a Registered Injection Well. Engineering reports and geotechnical studies may be required to satisfy the UIC permit conditions to operate the facility.

The existing site is relatively flat with slope generally less than 5 percent. The proposed site will maintain the existing grade while gently sloping away from buildings and towards drywells. See Figure 13.

7.3.2 Water Supply and Fire Flow

The campus is serviced by an 8-inch County of Hawaii Department of Water Supply (DWS) water main running along Kawili Street. The existing water meter that services the campus is located at the entrance near the intersection of Hinano Street and Kawili Street. The existing water meter should be adequate for providing service for the proposed improvements.

Within the campus, the majority of the existing 12-inch waterline will have to be removed and a new waterline installed to accommodate the proposed improvements. New water mains will range in size from 8-inches to 12-inches. The existing fire hydrants will be relocated to a maximum spacing of 300 feet in accordance with DWS standards. See Figure 14.

Potable water demand for the proposed improvements is not expected to exceed the current potable water demand for the existing campus. Use of rainwater and graywater for non-potable uses and irrigation is expected to contribute to the decrease in potable water demand.

7.3.3 Fire Protection

The County of Hawaii Department of Water Supply Water System Standards requires a fire protection system that has the capacity to dispense 2,000 gallons of water per hour for a duration of two hours with a minimum residual pressure of 20 pounds per square inch. Fire hydrants are required to be spaced at a minimum of 300 feet apart. See Figure 14.

7.3.4 Wastewater

The existing wastewater from the campus is disposed of through the County of Hawaii Department of Environmental Management (DEM) wastewater system running along Kawili Street. There are two points of connection for the campus, one at the main entrance and one at the entrance near the intersection of Kawili Street and Hinano Street. Both connection points are 8-inch gravity sewer mains flowing towards the intersection of Manono Street and Kawili Street. The wastewater ultimately is conveyed to the DEM Hilo Wastewater Treatment Plant.

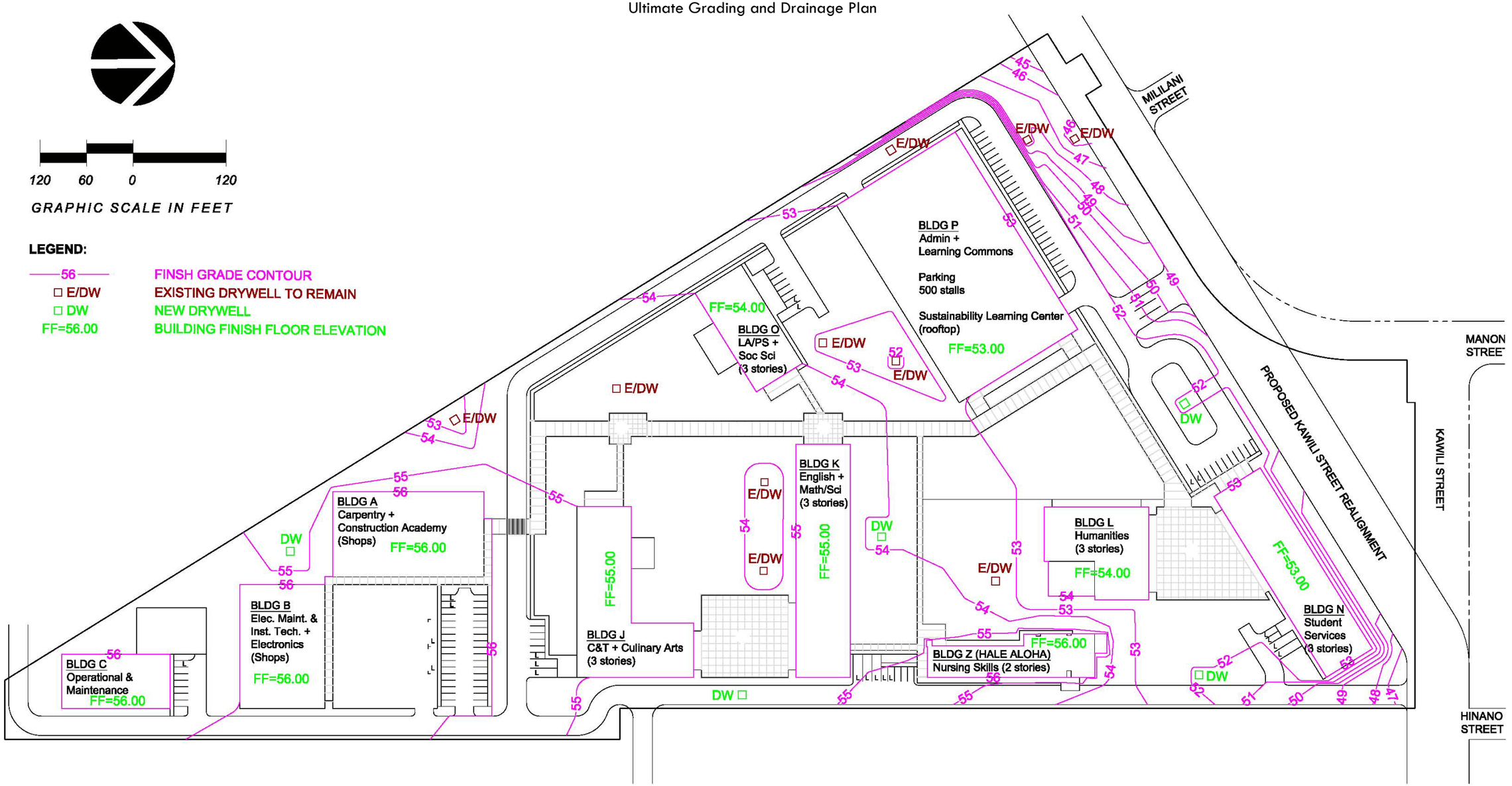
The proposed improvements will utilize the existing connection points and portions of the existing sewer mains within the campus. New gravity sewer mains and laterals will be installed to accommodate the proposed improvements. See Figure 14.

The wastewater demand for the proposed improvements is not expected to exceed the current wastewater demand for the campus. Use of low flow fixtures and other water saving technology will contribute to the decrease in demand.

Table 8
Summary of Expected Water Flows and Sewage Flows

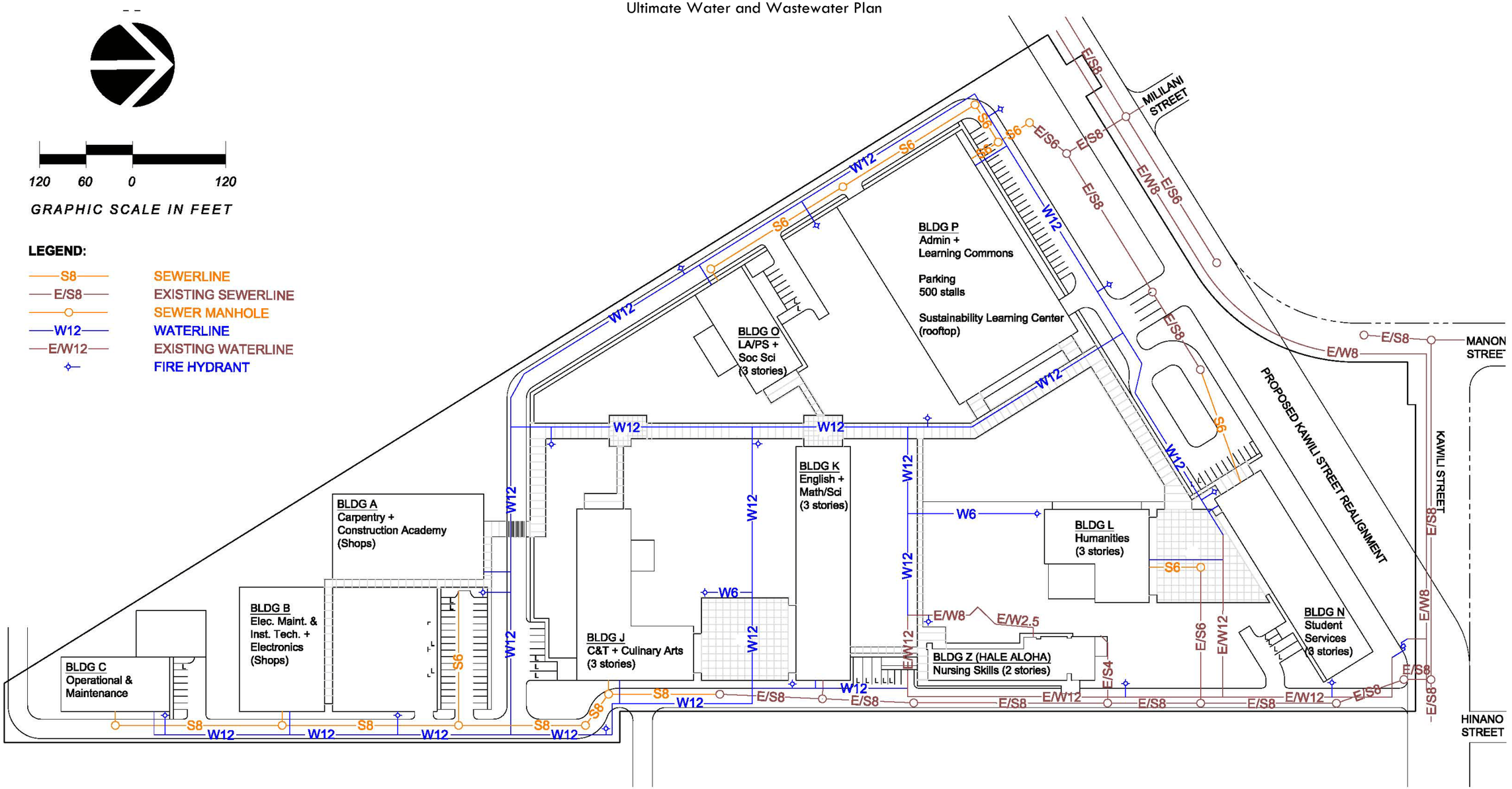
	Building	Water (gpd)	Sewer (gpd)
A	Carpentry and Construction Academy	297	297
B	Electrical Maint/Install & Electronics	645	645
C	Planning, Operations & Maintenance	123	123
J	Career & Technical, Culinary	5,412	5,412
K	English & Math/Science	3,737	3,737
L	Humanities	2,353	2,353
N	Student Services	187	187
O	Liberal Arts, Social Sciences	1,446	1,446
P	Combined Parking and Other	2,023	2,023
Z	Hale Aloha, Nursing	230	230
	TOTAL =	16,453	16,453

Figure 15
Ultimate Grading and Drainage Plan



[This page intentionally left blank]

Figure 16
Ultimate Water and Wastewater Plan



[This page intentionally left blank]

7.4 ULTIMATE ELECTRICAL AND COMMUNICATIONS PLAN

7.4.1 Electricity

HELCO presently has a 12.47 kilovolt (kV) overhead distribution line along Kawili Street, which initially will be used to serve the Manono Campus.

The present demand is 533 KW with power factor of 99%. The Manono Campus electrical system is presently supplied by one underground loop feeder connected to HELCO service on Kawili Street via concrete encased polyvinyl chloride (PVC) Schedule 40 conduits. A primary meter and switchgear is located nearby the driveway and parking lot adjacent to Building 382, Culinary Arts and Cafeteria Building.

The primary campus distribution system should consist of two (2) conduits and two (2) spare conduits for the campus distribution feeders. Each transformer for the campus buildings should be provided with switching equipment for the campus loop feeder. This will allow each building to operate on the loop feeder if there is a problem with any feeder segment.

7.4.2 Telecommunications

Concrete encased ducts running from a pole on Manono Street will provide telephone service. A new centralized telecommunications center, which includes a switch room for telephone equipment should be provided with the Manono Campus or existing spare in Building 380 should be expanded and modernized to accommodate the projected new facilities and student population. Dedicated fiber should run from the telecommunications center to all buildings on the campus. Wireless capability must be incorporated into the telecommunications system.

Hawai'i Interactive Television System (HITS) will be delivered via fiber service to the telecommunications center for distribution throughout the campus. From the telecommunications center, concrete encased ductlines should be installed along the same route as other telecommunications equipment.

7.4.3 Cable Television (CATV)

The Oceanic Time Warner Cablevision system should be extended via underground ducts from pole on Manono Street for CATV service to the Manono Campus site. CATV lines should be distributed to each building from the telecommunications center.

7.4.4 Security System

A central security system is recommended throughout the campus. The main equipment should be located in the same room as the fire alarm control panel and will be similar in topology as the fire alarm system. Each building should have a sub-panel that will communicate with the main panel. Key rooms (e.g., main telecommunications room, computer laboratory, etc.) and building entrances should be monitored. A mass notification system should be considered as part of the security system.

7.4.5 Fire Alarms and Detectors

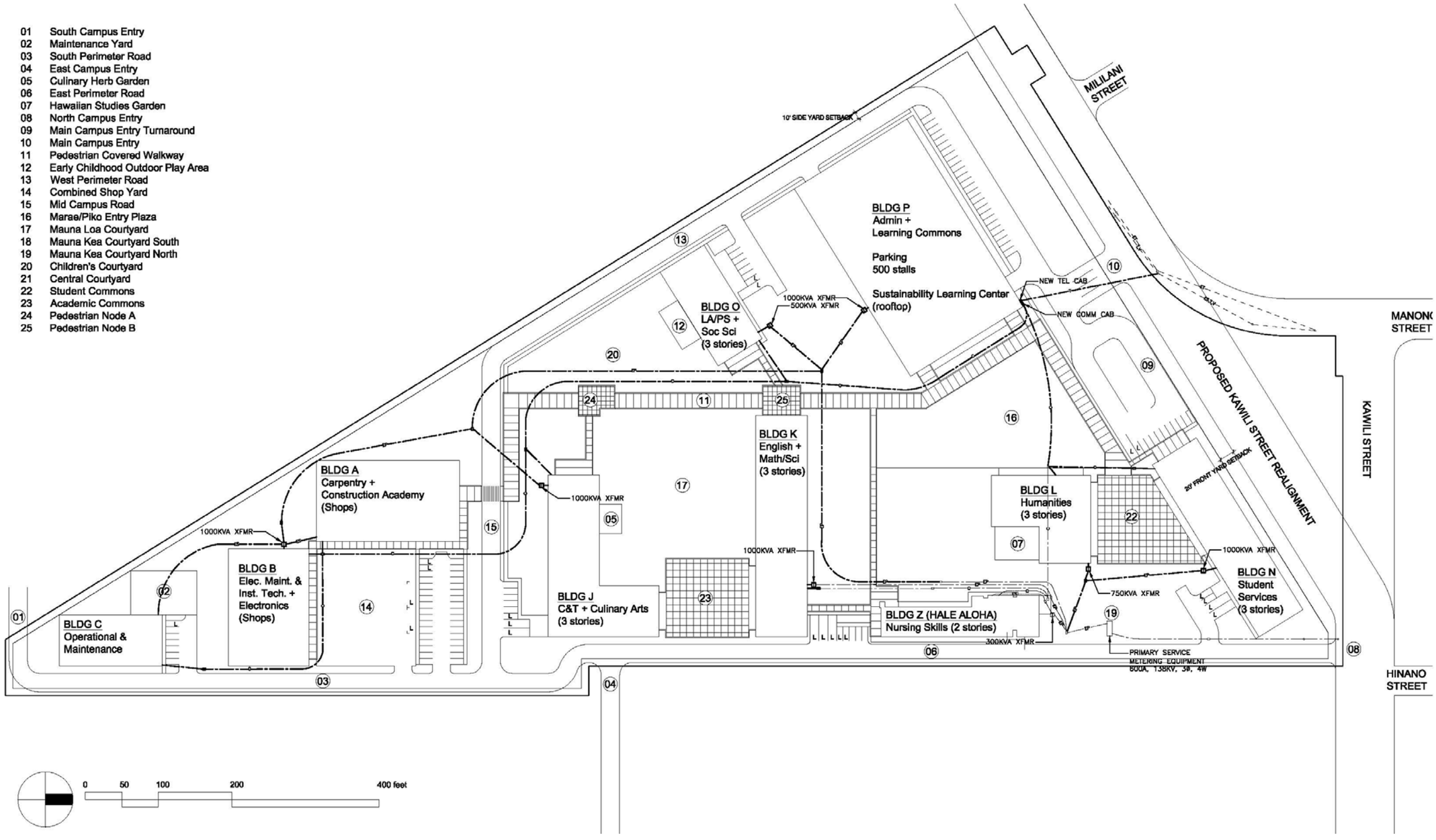
The Manono Campus should incorporate a centralized fire alarm system. Each building should have its own control panel, pull stations, speakers, ADAAG flashers, smoke detectors, heat detectors, duct detectors and required sprinkler monitors. Each building should be connected back to the central fire alarm panel. The main panel and the satellite panels should be capable of communicating with each other. The system should be fully addressable and electrically supervised. There should be a separate ductline and handhole system installed throughout the campus to facilitate interconnection of the system components.

7.4.6 Lighting

Exterior lighting must comply with the Hawai'i County Ordinance 92-01, which requires all exterior luminaries to be fully shielded and to utilize low-pressure sodium lamps. All roadways, parking lots, and pathways must be illuminated for nighttime safety and security. Building perimeters should be tastefully illuminated with shielded low-pressure sodium luminaireas.

Interior lighting throughout the Manono Campus should use fluorescent T-8 lamps with electronic ballasts for classroom, offices, support areas and corridors. Where downlighting is desirable, compact fluorescent type luminaries can be utilized. Dimmable ballasts in conjunction with the fluorescent base sources should be used in rooms that require varying levels of lighting. In HITS room, computer labs, and other similar spaces heavily populated with video display terminals, indirect type quartz-based lamps to provide for instant restart after momentary power failures. Consideration should be given to maximizing the use of natural daylighting.

Figure 17
Ultimate Electrical and Communication Plan



[This page intentionally left blank]

7.5 ULTIMATE MECHANICAL PLAN

7.5.1 Cooling Requirements

Estimated Cooling Requirements for the Ultimate Plan are shown in Table 9. The Ultimate Mechanical Plan will be implemented in phases to coincide with the Transition Plan (Section 10.)

Table 9
Estimated Cooling Requirements Per Phase

Building		Phase	Max CHW AC Load (tons)	Max DX AC Load (tons)	CHW Plant Size (tons)*	
					Option 1	Option 2
A	Carpentry and Construction Academy	1	215		215	270
P	Combined Parking and Other					
L	Humanities	2	300		415	540
N	Student Services					
B	Electrical Maint/Install & Electronics	3	52		615	540
C	Planning, Operations & Maintenance					
J	Career & Technical, Culinary	4	605		815	810
K	English & Math/Science					
O	Liberal Arts, Social Sciences					
Z	Hale Aloha, Nursing			67	0	0

7.5.2 Central Plant

An approximate 6,000 square foot building for the central chilled water plant will be constructed in Phase 1 to serve buildings constructed in Phases 1, 2, 3, & 4.

The central chilled water plant will be located at the west side of Building A: Carpentry & Construction Academy.

To satisfy building cooling demand for each phase, a chiller and cooling tower will be installed at the central chilled water plant as shown in Option 2, Table 10.

The chiller plant will consist of water cooled magnetic bearing chillers with variable speed drives, induced draft type stainless steel cooling tower with variable speed fans, and variable primary/secondary chilled water and condenser water pumping systems. All chillers and cooling towers will be located at ground level to allow easy access for refrigerant recovery equipment that is required when conducting routine maintenance on the chillers

Table 10 shows the two (2) options that were considered for chiller and cooling tower sizing during each phase.

Table 10
Central Plant Options

Option	PHASE #1	PHASE #2	PHASE #3	PHASE #4	Ultimate Plan
#1	(1) 215 TON CHILLER	(1) 200 TON CHILLER	(1) 200 TON CHILLER	(1) 200 TON CHILLER	(1) 215 TON & (3) 200 TON CHILLERS
#2	(3) 270 TON CHILLERS	(1) 270 TON CHILLER		(1) 270 TON CHILLER	(3) 270 TON CHILLERS

Option #2 is recommended.

For Phase #1, a 270 ton chiller and cooling tower will be installed at the central plant to serve Building P: Admin Learning Commons. Provisions for connection to the future chiller and cooling tower will be provided. Provisions for chilled water distribution of future phases should be provided.

During Phase #2, a second 270 ton chiller and cooling tower will be installed providing a 540 ton chilled water plant to serve the additional Building L: Humanities and Building N: Student Services.

During Phase #3, Building B: Electrical Maintenance & Building C: Operation & Maintenance will be constructed. The existing 540 ton chilled water plant will be adequate to serve the new buildings.

During Phase #4, a third 270 ton chiller and cooling tower will be installed providing a 810 ton chilled water plant to serve the additional Building J: Culinary Arts Building, Building K: English & Math/Science, and Building O: Social Science.

The advantages and disadvantages of Option 2 are:

Advantages

- Smaller chilled water plant size
- Incremental chilled water system installation
- More efficient use of initial chilled water plant space
- Adequately meets Phase 2 cooling requirements

Disadvantages

- Slightly higher installation costs for Phase 1 and 2

The chiller plant should utilize a variable primary/secondary chilled water pump system for energy conservation. Primary chilled water pumps will utilize constant speed motors. Variable speed motors will be used on the secondary piping system.

Again, there are two options for chilled water piping:

Option #1: Above ground chilled water piping:

Above ground chilled water piping would run under the canopy of the Pedestrian Covered Walkway System.

Advantages

- Eases required maintenance.
- Eases future replacement.

Disadvantages

- Improper installation may cause piping condensation.
- May be unsightly to campus users in building upper levels.
- Increased cost for above ground seismic pipe support system.
- Increased installation cost.

Option #2: Underground pre-insulated PVC chilled water piping:

Underground ground chilled water piping would be run the under campus walkways.

Advantages

- Not visible to campus users.
- Does not require above ground support system
- Below grade PVC piping cheaper than above grade black steel piping.
- Cheaper installation cost.

Disadvantages

- Increased replacement cost.

Option 2 is recommended. It provides lower installation cost, minimizes chilled water pipe lengths and is not visible to campus users.

Corrosion resistant materials or coatings should be provided for all surfaces of equipment and materials that are exposed to outside air.

7.5.3 DX System

DX systems are direct-expansion unitary systems. In a direct-expansion (DX) unitary system, the evaporator is in direct contact with the air stream, so the cooling coil of the airside loop is also the evaporator of the refrigeration loop. DX systems come in either packaged or split systems. DX systems are very advantageous for buildings with small air conditioning loads and/or buildings that require standalone air conditioning systems.

Packaged DX systems are those where the components of the DX unitary system refrigeration loop (evaporator, compressor, condenser, expansion device, and supply fan) are packaged together as one unit.

Split DX systems are those where the indoor airside evaporator units are physically separated from the outdoor compressor and condensing units. The two separate units are attached together via refrigerant piping. The indoor airside evaporator units come in the form of fan-coil units, (FCU's).

DX systems have been designed for the existing Hale Aloha Nursing Skills Building.

7.5.4 Mixed Mode

For Manono Campus Buildings, a "Mixed-Mode" AC system was requested, and is defined as a user's ability to individually control the mode of AC operation in a space. The "Mixed-Mode" system will allow individual spaces to operate under mechanical cooling (AC) while simultaneously allowing other spaces to operate under natural ventilation with mechanical cooling off. Operable window(s) will be interlocked with the AC system. Upon opening of the window(s), mechanical AC in that space will be shut down.

7.5.5 Energy Monitoring & Control System

Controls for chillers, cooling towers, pumps, fan coil units, air handling units, VAV boxes, and exhaust fans, will all be integrated into a single control system. Each piece of equipment, (chillers, cooling towers, air handling units, pumps, etc.) should have a controller to start, stop, and regulate operation based on sensor input.

7.5.6 Ductwork

Insulated galvanized steel ductwork will be used for supply air ductwork. Supply air will be ducted with exterior wrap insulation. Return air will be fully ducted. Main supply air ducts are externally insulated. Exposed ducts should be double walled. Fiberglass ductwork is not allowed. All exposed ductwork and supports should be painted to match adjacent surfaces.

7.5.7 Indoor Design Conditions

This design includes an indoor design temperature of *75*°F (dry bulb) *55* percent (relative humidity) for all air conditioned spaces.

7.5.8 Outdoor Design Conditions

Outdoor design temperature: 87°F (dry bulb), *75*°F (wet bulb).

7.5.9 Ventilation

All restrooms will be mechanically ventilated unless otherwise instructed by client. Ventilation rates shall be governed by Department of Health ventilation standards. Buildings and equipment must be in compliance with the *ASHRAE Handbook - HVAC Applications*. Outside air intakes should be located to avoid taking in exhaust air and other sources of potential contamination.

7.5.10 Plumbing Systems

Design of the plumbing system for the campus must be in accordance with the Uniform Plumbing Code (1997) as amended. Solar heating and heat recovery from the AC system should be utilized for the hot water system. A backup gas hot water heater should be used.

7.5.11 Fire Sprinkler Systems

Sprinkler protection must be evaluated at the design stage to account for the use, building configuration and cost-benefit ratios.

7.5.12 Propane Gas Systems

A propane tank should be located adjacent to each building that requires fuel for water heater, or kitchen use. Shutoff valves must be provided to allow isolation for repair, maintenance and reconfiguration without affecting the entire system.

[This page intentionally left blank]

8.0 ARCHITECTURAL BARRIER-FREE PROGRAM

The Ultimate Site Plan is designed to ensure accessible and barrier-free routes for pedestrians and vehicles throughout the campus core. The Barrier-Free Access Plan is presented in Figure 20

Accessibility standards for the physically disabled are provided in the ADAAG. The ADAAG is a set of comprehensive guidelines that strive to ensure safe, barrier-free access to all areas of a given facility.

8.1 SITE CONSIDERATIONS

Accessible Parking Stalls. Accessible stalls will be provided throughout the various phases of development of the Manono Campus. Each phase will contain sufficient numbers of accessible parking stalls and access routes for only that particular phase. As each additional phase is constructed, the number of accessible stalls will increase in proportion to the added number of parking stalls. Table 4.1.2(5)a of ADAAG gives the number of accessible stalls for any given number of parking stalls. One (1) of every eight (8) accessible stalls is to be designated "Van Accessible." A number of drop-off areas for the physically disabled also will be provided.

Accessible Routes. Accessible routes complying with Section 4.3 of ADAAG will be provided throughout the entire campus from parking lots, bus stops and drop-off areas to building entrances. These routes will include any ramps required to negotiate slopes, walkways of sufficient widths and minimum slopes, handrails, curb cuts, surface stripping, and related directional signage. With the exception of ramps, walking paths throughout the campus will generally be designed to about three (3) percent to five (5) percent slope.

8.2 BUILDING CONSIDERATIONS

Accessible Buildings. All buildings at the Manono Campus, with the exception of the Hale Aloha, will fall under ADAAG section 4.1.3 because all such buildings will be of new construction. The number of access routes to each building is governed by the ADAAG. Building interiors must fully comply with ADAAG guidelines.

Elevators. Elevators will be required in multi-level buildings to provide vertically accessible transportation.

Doors, Entries and Hallways. Doors, entries and hallways in all buildings must be of sufficient width and dimensions to meet accessibility standards. Appropriate graphics and directional signs must be provided.

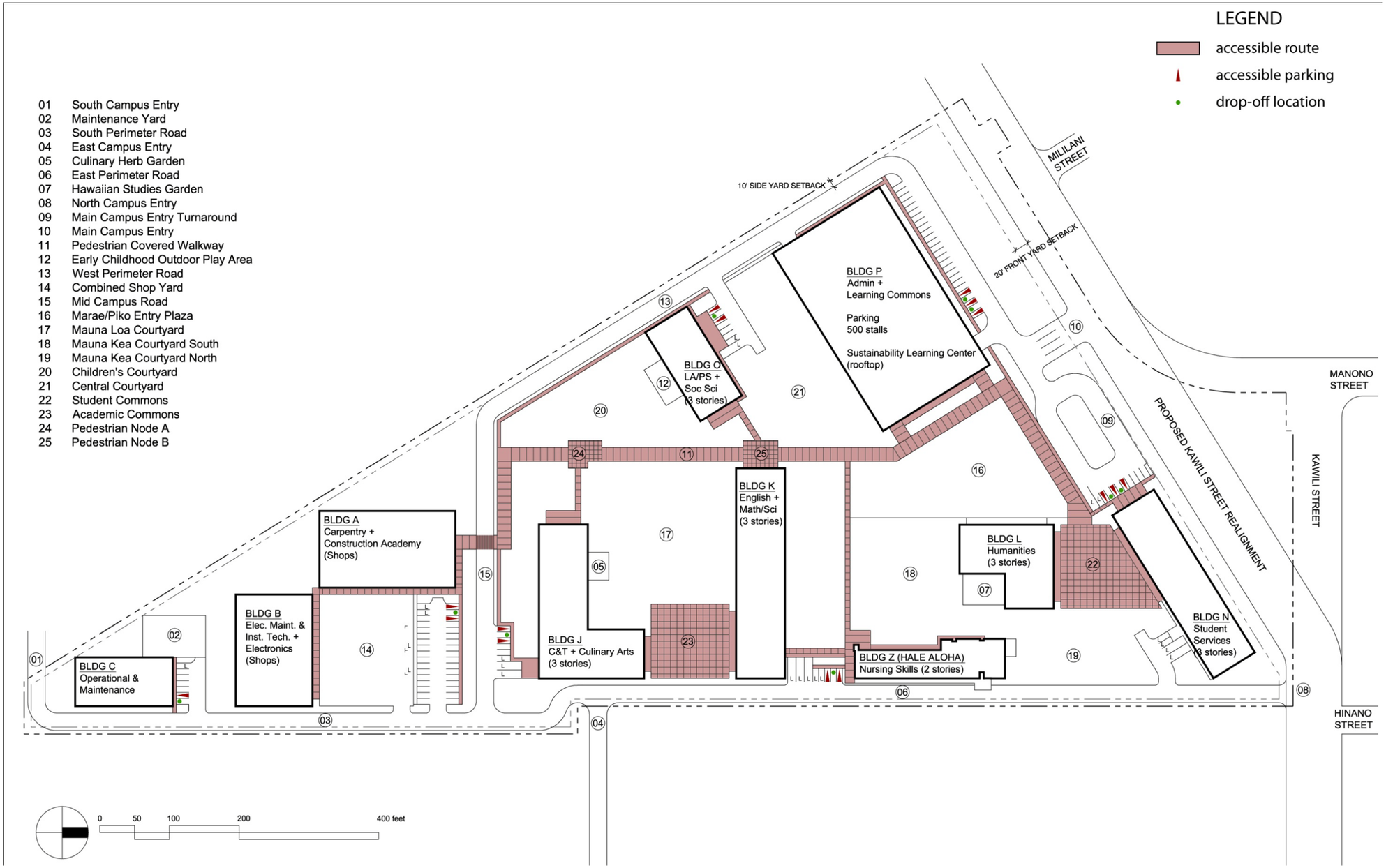
Toilet Facilities and Drinking Fountains. All toilet facilities and 50 percent of the drinking fountains within the campus must be designed to be accessible.

Telephones. All telephones in the Manono Campus, including pay phones, must meet ADAAG requirements. Table 4.1.3(17) of the ADAAG provides the extent and number of telephones required to meet accessibility standards.

Assembly Areas. Fixed-seat assembly areas will require wheelchair locations according to the total number of provided fixed-seats.

Emergency Egress and Communications. Accessible routes serving any accessible space shall also serve as a means of egress for emergencies or connect to an accessible area of rescue assistance. In general, the area of rescue assistance will not be required because the UHCWH will be designed with only one-story buildings.

Figure 18
Barrier-Free Access Plan



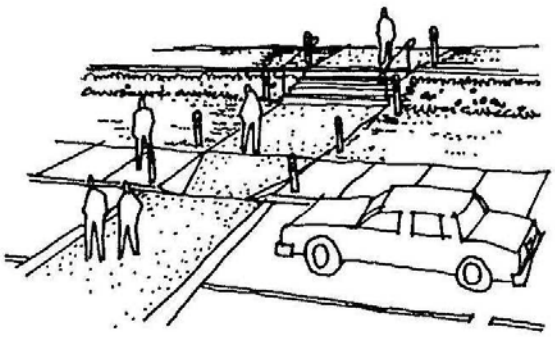
[This page intentionally left blank]

9.0 DESIGN CONSIDERATIONS AND GUIDELINES

9.1 PEDESTRIAN SPINE AND PATHS

The pedestrian spines and paths provide a circulation system connecting the various campus components. As a major organizing element of the campus, the pedestrian spines and paths should be well defined to create a sense of order and hierarchy. The main spine serves as the primary path for the campus, with secondary paths extending from it to the various uses and activities on the campus. The Pedestrian Covered Walkway should be viewed as providing a sequence of events, an interconnection of "places", rather than simply a corridor to get from one building to another. The following are general guidelines for the pedestrian spines and paths on campus.

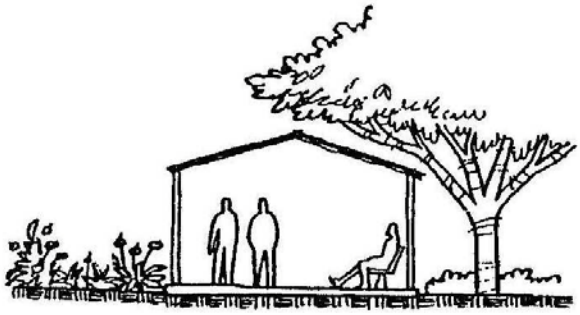
1. Establish separate pedestrian and vehicular pathways. Where these paths intersect, for example the intersection of the Pedestrian Covered Walkway and the Mid Campus Road, provide safe, short crossings highlighted through the use of bollards, pavement changes, planters, and accent vegetation.



2. Establish a hierarchical pedestrian walkway system which provides for different types and levels of use. The design of each walkway should visually communicate its role within the pedestrian network. The main spine should accommodate the efficient movement of students between classes within all major portions of the campus, while the remainder of the paths will serve to provide a complete connection between all the campus facilities.

3. Paths should lead directly to destinations, without major deviation. They should flow smoothly without abrupt changes in direction or obstacles in the walks. Where directional changes occur, accent planting material should be used to highlight these transition areas.

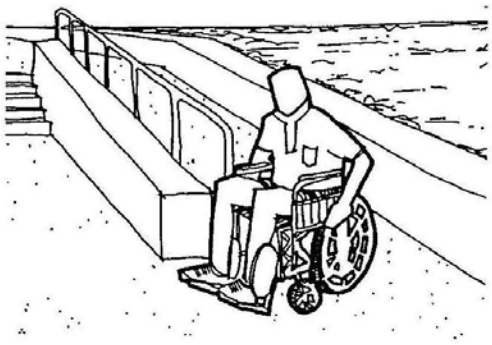
4. Amenitize and reinforce pedestrian pathways and open spaces with planting and site furnishings.



5. The alignment of walkways should capitalize on visual amenities along the route including views of campus buildings, open spaces, and views beyond the campus such as to Mauna Kea.

6. Provide safe lighting throughout the campus by utilizing theme fixtures along pedestrian pathways and cast lighting directed from adjacent buildings into the activity areas.

7. Provide accessibility for individuals with disabilities to all buildings and principal outdoor assembly areas. Maintain barrier free access dimensions for all ramps, walkways, doors, halls, toilets, public telephones, drinking fountains, and designated parking per ADA requirements.



8. Provide level rest areas at appropriate intervals along the main walkway system, as are required by code for individuals with disabilities.

9. Provide a non-slip, low maintenance surface with texture and/or color cueing.

10. Provide sensory aids for the visually impaired (e.g. Braille signs and texture changes in pavement.)

11. Consider the future development of the campus in the layout of pedestrian paths.

12. Provide for security by allowing visual control, security lighting, and avoiding hiding places along pedestrian paths.

13. Strive to maintain a pedestrian/human scale for all of the walkways on campus.

14. The horizontal alignment of paths should usually follow the natural topography, with ramps preferred over the use of steps. Comfortable walking surfaces should have adequate widths to handle the expected type and volume of traffic.

15. Design walkways and overhead shelters, with materials which are appropriate to the existing climatic conditions at the Hawaii CC campus.

9.1.1 Walkway Canopies

In conjunction with the building guidelines, in order provide consistency and enhance the functionality of all walkways, the walkway canopy should have the following characteristics:

1. A roof slope minimum of ¼" per foot.

2. Roof overhangs sufficient to protect covered walkways from exposure to the rainy environment.

3. Roofing material of standing, flat, batten seam metal, or single ply membrane over metal decking.

4. Supporting columns should be of naturally finished materials with good weathering characteristics, such as steel or concrete.

5. Columns should be frequently spaced to provide a rhythm and scale to the pathway.

6. Gutters or diverters are required only where the covered walkways intersect with open walkways, and areas under which pedestrians pass.

9.1.2 Walkway Materials, Colors and Patterns

1. Walkway surfaces should be of an unpainted, durable, non-slip material with a textured surface. As noted previously, the surface should be sufficiently level to accommodate individuals with disabilities, but should also be designed for proper drainage.

2. Acceptable materials for walkways might include concrete, brick, payers, or a combination of these materials. Asphalt paving is not acceptable, except for temporary walks. For durability, ease of maintenance, and economy, the use of concrete is best. Special care should be taken in assuring a high quality of scoring and jointing techniques.

3. The potential variation in finish for walks is great. Standard walks should have a coarse broom finish, with walk edges, control joints, and construction joints smooth tooled. Typical walks should be warm toned, natural colored concrete. Other concrete finishes might include exposed aggregate surfaces, rock salt texturing, special coloring, or the use of stamped and/or textured concrete imprinting processes to give an appearance of brick, stone or payers. These special finishes are more expensive and should be reserved for

areas of visual impact such as door entries, walk intersections, paved plazas and other nodes. Paving patterns, colors and textures should be selected to complement the surrounding context and to create visual harmony.

4. Single color or muted patterns for paving should be selected, as heavily contrasting patterns create visual ambiguity for persons with visual impairments.

5. Glossy surfaces or surface materials which produce sharp, brilliant reflections of light should not be used.

6. Limit the use of dark surfaces (reflectance less than 20 percent) as they often provide a strong contrast with the surrounding environment; therefore variations in the surface are less discernible to the visually impaired and mis-steps may result

7. A cueing system consisting of textures and/or color cues for paving should be developed that is consistent throughout the campus and relates to interior flooring cues. This system should provide textural and color cueing for potential hazards (slopes, steps, adjacent service areas and vehicle zones, walkway intersections, paths or walks entering large pedestrian plazas), and areas and facilities adjacent to or connected to walks (such as transportation areas, rest stops, picnic areas, public conveniences such as telephones, drinking fountains, trash receptacles).

9.1.3 Pedestrian Spines (Primary Paths, Covered)

The main spine should serve as the major interconnecting path system throughout the campus. It will serve as a link to secondary paths established for the campus.

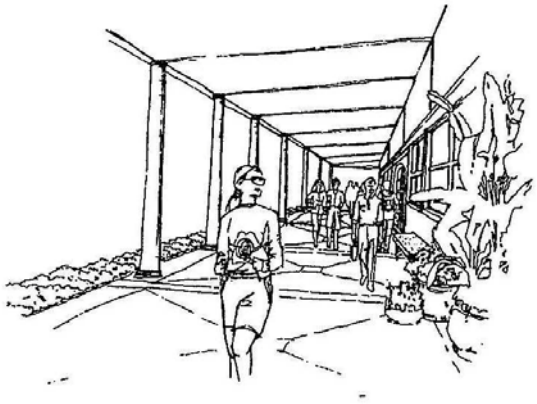
1. The main spines will be entirely covered walkways.

2. Except for emergency vehicles, the main spine should be limited to pedestrian traffic only. Primary and secondary walkways should be broad and constructed of high quality, non- slip paving material. Awnings and covered seating could be provided as an extension from adjacent buildings.

4. To provide access for individuals with disabilities and to promote more efficient crowd movement, stairs or steps are not permitted along the spine. Each facility must have at least one entrance connecting to an accessible route through the campus.

5. The covered portions of the spine should be incorporated as part of the planning and design of each new building on the campus.

6. To help define and create a sense of identity, the spines should take on the appearance of a landscaped pedestrian mall designed with the use of consistent paving materials/patterns, along with rest areas supplemented with coordinated site furnishings such as planters, high-quality lighting (for safety), drinking fountains, banners, information kiosks, signage, benches and attractive trash containers.



7. The maximum gradient for these walkways is 5 percent with a minimum width of 16 feet

8. Landscaping may be used to mark primary spine and secondary walks.

9. The minimum clear height of these walkways should be 9.5 feet.

10. Bicycle parking should be provided in strategic areas at entrances to the primary spine; however, bicycle riding should not be permitted on the spine.

9.1.4 Secondary Paths (Covered and Uncovered)

Covered and uncovered paths extend from the primary spine and serve as secondary pedestrian walkways throughout the campus. These walkways will handle traffic to or between individual buildings and parking areas.

1. The majority of these paths should be covered.

2. The paths should be limited to pedestrian traffic, but should also be designed to accommodate an occasional service vehicle.

3. The maximum gradient for these walkways should be 5 percent. If the grade requires a steeper walkway, the walkway must be designed as a ramp to meet the requirements of the ADA Accessibility Guidelines.

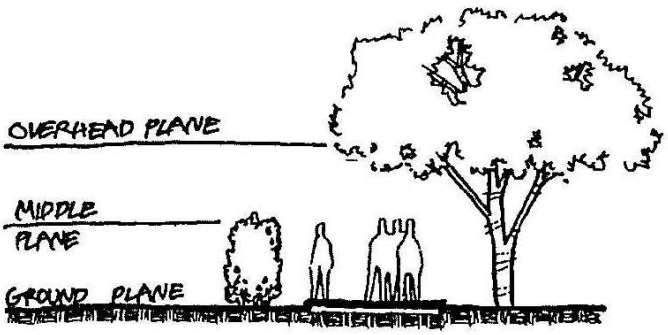
4. Paths should be no less than 8 feet wide, with a minimum clear height of 8.5 feet (for covered walkways).

5. Plantings along the secondary paths can be less formal in character compared to the primary spine. Variation in planting material is permitted along each of the paths leading to the campus, but a consistent use of planting material is required for each individual path. The Plant List should be used as a guide for the planting material along the paths.

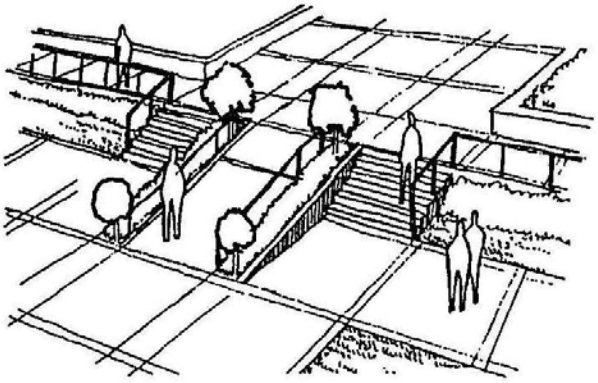
9.2 PLAZAS, COMMONS AND OPEN SPACES

Paths, activity areas and open spaces are closely interwoven elements which serve to establish a sense of identity and character to the campus. Emphasizing the development of these elements incorporates the idea that the life of the campus occurs not only inside the individual buildings but at certain activity areas and open spaces which are part of, or adjacent to, the circulation system. When well designed, these spaces can provide an attractive and relaxed contrast to the facilities around them. General design guidelines for activity areas and open spaces are presented below.

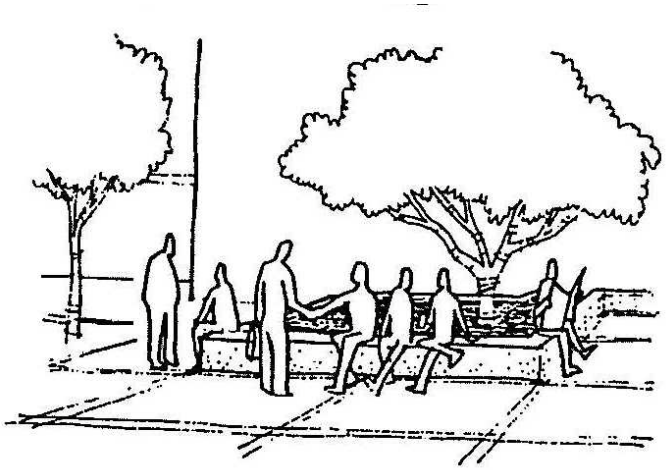
1. To establish the volumetric definition of a plaza, courtyard, or open space, the ground plane (paving, ground cover), middle plane (walls, trees, shrubs), and overhead plane (tree, canopy, trellis), as well as changes of level across the plaza or courtyard space need to be carefully designed.



2. Plazas, courtyards, and open spaces should be accessible to individuals with disabilities. Where steps or changes in level occur alternate ramp access should also be provided.



3. Plazas and courtyards should be designed to provide an atmosphere for relaxation and provide opportunity for student interactions such as formal gatherings and assemblies, relaxation or eating.



4. Plazas, courtyards, or open spaces may function as formal entrance spaces to buildings or a group of buildings; as an entrance, they should direct traffic to the building.

5. The design and appearance of the open space should visually relate to and complement the design of adjacent buildings.

6. Views to and from the proposed plaza, courtyard, or open space from strategic viewing positions should be considered in the open space design.

7. The potential volume of pedestrian activity and circulation patterns should be considered as the major factors affecting the size, scale and design of plazas, courtyards and open spaces. The desired degree of spatial definition as well as the character of the space should be determined in the initial phase of the design process.

8. Plazas, courtyards and open spaces should be buffered from roads and parking areas to minimize noise and air pollution, as well as the visual impact.

9. Where possible, plazas, courtyards and open spaces should incorporate existing topographic relief into its form to add visual interest, to preserve existing vegetation, and to minimize cut and fill costs.

10. Design plazas, courtyards, and open spaces with materials which are appropriate to climatic conditions, such as non-skid surfaces for exposed areas receiving a high degree of precipitation.

11. Microclimate is an important factor in determining human comfort within proposed plazas, courtyards, and open spaces. Wind intensity and direction, sun angles, duration of direct sun and precipitation should be evaluated during the site analysis stage of the design process for a proposed plaza, courtyard, or open space.

To better organize and define spaces on the campus, a hierarchy of open space has been established for the campus. The hierarchy is based on the function and activities which occur within the various open spaces on campus and is as follows: 1) the Marae/Piko Entry

Plaza, 2) pedestrian nodes, 3) courtyards, 4) Hawaiian Studies garden, 5) Culinary Herb Garden and 5) other open spaces. Design guidelines for each of the spaces are discussed below.

9.2.1 The Marae/Piko Plaza

This plaza is an active space centrally located at the main entry to the campus. It serves as the main gathering area on campus and should accommodate informal gatherings and student activities. The following guidelines are recommended for the Marae/Piko Entry Plaza.

1. The Plaza should be on the grade of the surrounding walkway and buildings. Appropriate landscaping could be included. Site furniture, including information or advertising kiosks, banners, lighting, trash receptacles, and large sculptural pieces of artwork could also be incorporated.

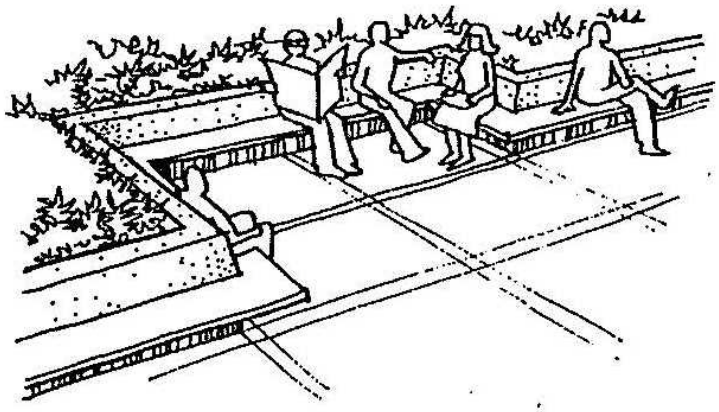
2. Design and detail the Marae/Piko Entry Plaza with materials which are appropriate to climatic conditions, such as smooth, stable, dry and non-skid surfaces. When used, paving for this plaza should be of the special materials or textures noted previously. Provide variation in paving surfaces where appropriate.

3. A distinct landscape theme should be established to create place identity. Hardscape surfaces should be predominant along with accent shrubs, hedges, and accent trees.

4. Due to the high use and visibility of this plaza, it should have priority for higher levels of maintenance. However, efficient landscape maintenance practices should also be considered.

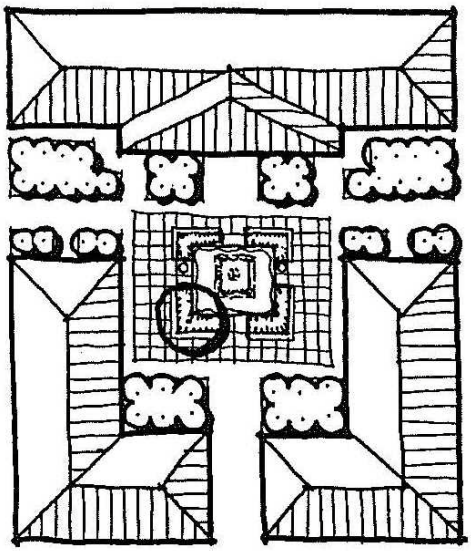
5. An outdoor seating and dining area could be provided under a portion of the covered area adjacent to the plaza.

6. Seating for the plaza should be a combination of site furniture, seatwalls, and stepped seating. The seatwalls around the perimeter of the plaza could contain landscaping.



9.2.2 Pedestrian Nodes

These hardscape spaces may be of any size, from a small paved intersection of walkways, to larger spaces with some street furniture and a number of smaller trees. They occur at intersections of the spine and paths, drop-off locations, or where the spine enters a large open area.



1. Pedestrian Nodes should be paved, and include landscaping and appropriate site furniture. Paving should be of special materials or textures to accent certain areas. Site furnishings could include information/advertising kiosks, bike racks, lighting, trash containers, and sculptural pieces.

2. Design and detail plazas with materials which are appropriate to climatic conditions, such as smooth, stable, dry and non-skid surfaces.

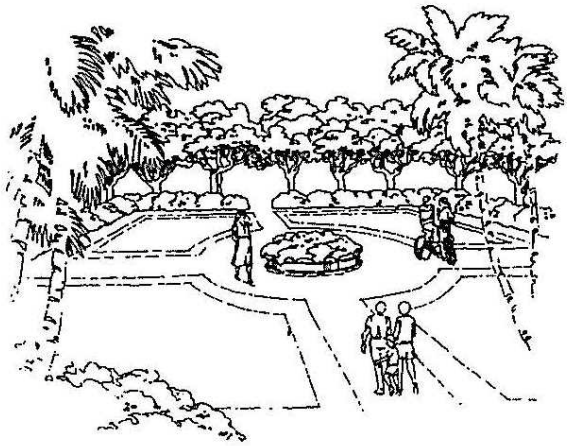
3. Provide food and coffee carts along with movable tables (with umbrellas) and chairs. The buildings which provide frontage onto these plazas could be embellished with awnings or arcades, for shade and protection from the rainy climate. Vending machines should be protected from weather and vandalism, and screened from view.

4. Distinct landscape themes should be selected for each of these plazas to create place identity. Hardscape surfaces should be predominant along with accent shrubs, hedges, and accent trees.

9.2.3 Courtyards

Courtyards are considered open spaces which have limited hardscaped surfaces (primary paths), but have more definition than natural open areas. They serve as grassed open spaces for the campus. These spaces also serve as informal gathering areas and should be able to accommodate gatherings and student activities. For these spaces, the overall

planting should resemble a passive park with a combination of native and introduced plant materials.



1. Provide trees to define spaces *and* circulation patterns, provide scale and shade, and provide atmosphere, interest, and character.

2. Use large trees to provide a green canopy in large areas. Use large trees as much as possible in order to present a landscape framework for buildings.

3. Encourage the use of native plant material.

Mauna Kea South Courtyard

- This courtyard should be designed as a natural extension of the Marae/Piko Entry Plaza.

- This space should be organized in a formal manner with an open grassed area traversed by pedestrian pathways. Plantings should be simple consisting of accent trees, and grassed lawns and should have a Hawaiian character.

- Intersections of walkways and key entries to buildings should be highlighted with accent planting and paving.

Mauna Kea North Courtyard and Mauna Loa Courtyard

- Consider making these theme courtyards with designs based on an established planting theme. Plant material could be identified with plaques indicating the common name, botanical name and origin.

- Walkways and entries to the adjacent buildings should be highlighted through the use of accent tree and shrub plantings.

9.2.4 Hawaiian Studies Garden

The Hawaiian Studies garden will be located in the area adjacent to the Humanities Building. It is primarily a landscaped open space which serves as an educational resource for students. The garden will consist of plants which are central to the Hawaiian Studies curriculum. Name plaques and information about specific plants and/or donor may be provided as appropriate.

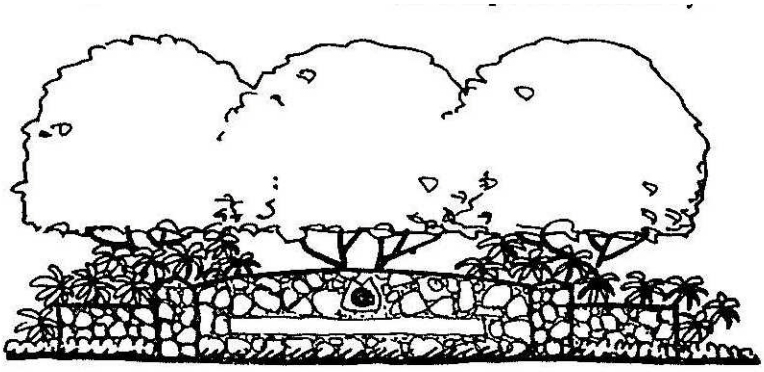
9.2.5 Other Open Spaces

In natural areas, existing plant material should be retained as much as possible.

The trees identified in the landscape plan for the east and west edges should be augmented with plant material such as *'ohi'a lehua* and *hapu'u* fern to reestablish the native plants to the area, and to create a natural edge which can blend into the adjacent parcels.

9.3 GATEWAYS, ENTRIES, AND EDGES

Gateways, entries, and edges are important characteristics of a well-defined campus. Together, these elements can invoke a strong sense of arrival into the campus community.



9.3.1 Gateways

Two gateways were identified for the campus. Include signage features at the Main Campus Entry and the East Campus Entry. The following guidelines apply to the two gateway intersections identified for the campus.

- The use of consistent signage should be installed at all of the gateway intersections.
- The use of rock walls, berming, flowering shrubs, and accent trees (such as True Kamani) should be incorporated as highlights for the gateways.

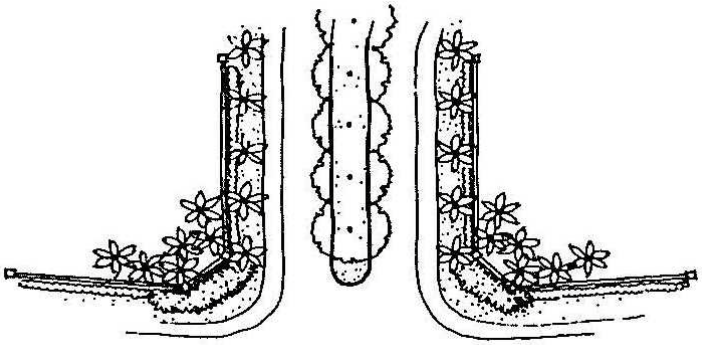
9.3.2 Entries

Having a few well defined entries, as opposed to having a number of ill-defined entries, will increase the sense of importance of each entry and will help to maintain the integrity along the edges of the campus. For the Hawaii CC campus, three levels of entries are recommended: primary entries, secondary entries and service entries.

Primary Entrance (Main Campus Entry)

1. For this primary entry, the sense of an entrance should be carried out to bordering roads which serve as the main access arteries to the campus.

2. Landscaped forms such as berms, sign wall monuments larger accent trees and palms, identity monuments, and directional signage should be utilized to highlight the entry. Accent plantings and lighting should be used to accentuate the entry.



3. The entry should be dignified, yet open and accessible.

4. If a median is proposed, it should be planted with true kamani and accent groundcover and special lighting fixtures should be provided. The roadway should be lined on both sides with native loulu palms to further enhance the entry sequence into the campus.

Secondary Entrance (East Campus Entry)

1. This entry should also have sign wall monuments, accent plantings and lighting, but on a lesser scale to establish a hierarchical pattern of importance.

2. This entry should also be lined with loulu palms.

Service Entries (North and South Campus Entries)

1. Service entries should be screened from view through the use of large trees and shrubs.

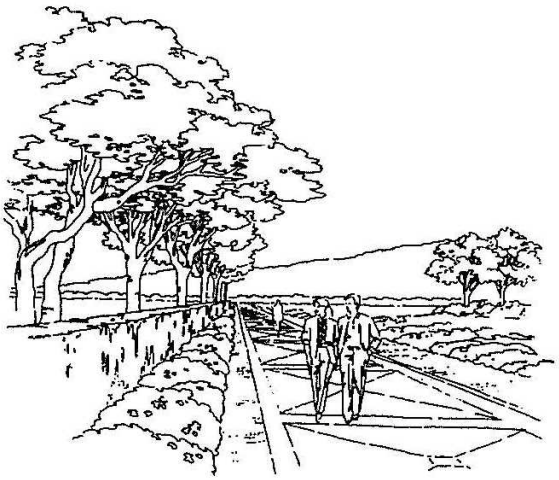
9.3.3 Pedestrian Entrances

1. Where pedestrians enter into the covered portions on the walkway system, the covered area should be articulated to call attention to the entry. These entrances should be paved with distinctive materials and reinforced with plantings.

2. Site furniture at each entry might include orientation devices, an information kiosk, benches, telephones, bicycle parking areas and art sculptures.

9.3.4 Edges

The edges, or borders of the campus, are important in clarifying the boundaries of a campus, as well as serving as a buffer to adjacent properties. The entire campus should have well defined edges.



1. The perimeter planting concept for the Hawaii CC campus is to create an edge for the campus in order to reinforce a sense of identity and define the boundaries of the campus.

2. Edges can be strengthened through the use of landscaping and berming. Each of these elements must be interrelated with the other to create the successful definition of a border to the campus.

3. Use of consistent planting material and landscape treatment is recommended for the edges of the campus.

9.4 VEHICULAR AND BICYCLE CIRCULATION AND PARKING AREAS

Roads and bike paths provide a primary means of on-site access as well as a vantage point along which one can enjoy views of the campus. Design guidelines for roadways and bicycle paths include general guidelines for roads, specific guidelines for the hierarchy of roads, and general guidelines for bike paths.

9.4.1 General Guidelines for Campus Roadways

1. Design roads to provide clear and direct links between destinations. Vehicular conflicts with bicycles and pedestrians should be kept to a minimum. Where crossing of vehicular and pedestrian paths occur, landscaping should be controlled so as not to interfere with safe lines of sight.

2. Develop a visual identity and hierarchy for roadways through the use of streetscape elements to provide an attractive roadway in keeping with its intended function.

3. Setbacks, plantings, earth berming, and other techniques can be used to visually integrate roads with the areas they serve.

4. Road alignments should relate to the natural contours of the land to minimize grading and destruction of the natural environment.

5. Plant trees along roadways with consistent themes to establish separate identities and scale to aid in the comprehension of the vehicular circulation system.

6. Roadways and parking lots should strive for a coherent, meaningful and attractive streetscape. The design of roadways and associated rights-of-way should strive to minimize clutter.

7. Roadway dimensions should relate to projected traffic flows.

9.4.2 Roadway Hierarchy

To facilitate the design of the various types of roadways on campus, a hierarchy of roadways is proposed for the campus. The hierarchical network of roads will serve to articulate the vehicular circulation pattern throughout the campus. This can be accomplished through the use of setbacks, planting, street furniture and signage. Design guidelines for the roadway types recommended for the campus are presented below.

9.4.3 Internal Road

Vehicular circulation is proposed to be accommodated by a loop road ringing the campus, providing access while enforcing a separation between vehicles and pedestrians. The complete loop is provided for efficient service access. Service areas will be located off of

the internal road, while most of the general university parking will be located in the main parking structure. Bicycle circulation will also be accommodated by this internal road.

1. The loop road should have a consistent planting.

9.4.4 Service Drives

Internal drives will have limited access for service, maintenance, and emergency vehicles.

1. Informal groupings of a single-species of flowering canopy trees identify the internal roadways.

2. An easement should be provided for landscaping.

3. Plant groupings should articulate driveways to buildings and other facilities. Berms can further articulate a separation between the roadway and adjacent parking lots.

9.4.5 Bicycle Paths

1. Bikeways should be designed as an integral component of the circulation system.

2. Provide for conveniently located and secure bicycle racks throughout the campus. Locations should include, but not be limited to, major activity areas and open spaces, areas at entrances to the pedestrian spine, and areas adjacent to major buildings.

3. Bicycle racks and parking areas should avoid obstruction of the pedestrian flow or access for individuals with disabilities along walkways or at building entrances.

4. Alignment and design of bikeways should maximize visual interest along the routes.

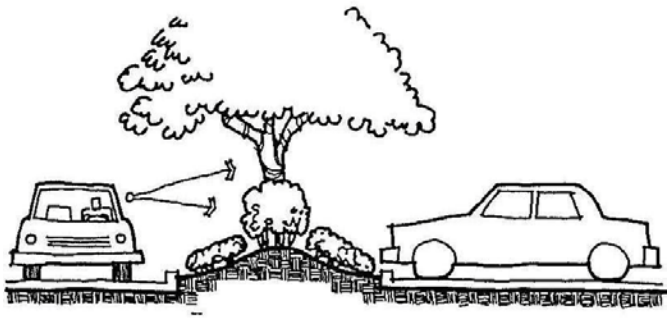
5. In designing bikeways in conjunction with secondary pedestrian walkways, four feet of pavement width should be added to accommodate bicycles. The bikeway should be identified with a painted stripe, signage, and stenciled graphics on the pavement to identify the bikeway lanes.

9.4.6 Parking Areas

1. Surface lots should be landscaped to mitigate negative visual and micro-climatic effects of large paved areas and parked automobiles.

2. The total parking area shall be landscaped with at least one 25 gallon tree per each 6 stalls and appropriate ground cover.

3. To effectively control the adverse appearance of exposed parking lots, parking areas should be screened around their perimeter with shrubs, hedges, berms, or a combination of these materials. Heights should not exceed 2 feet 6 inches for hedges and shrubs due to safety concerns.



4. Provide buffers to minimize noise onto adjacent uses and facilities.

5. Limited special VIP and disabled parking spaces should be integrated with service areas to facilitate convenience and safe access. Facilities should be planned with efficient service and loading areas, sized to accommodate the functions within the building, and screened from surrounding areas.

9.5 CONCEPTUAL LANDSCAPE DESIGN GUIDELINES

9.5.1 Planting

The organization of landscaping for the campus is graphically illustrated in the Ultimate Landscape Plan. These planting guidelines serve to implement the overall concept established in the Ultimate Landscape Plan. The guidelines are supported by the Landscape Plan Plant Palette (see Table 6) which identifies planting material for various portions of the campus.

1. The overall landscaping concept should consist primarily of open lawn and groundcover areas and trees. Landscape plans should be simple in design to minimize maintenance requirements. Small turf areas should be avoided by using ground covers or volcanic cinder, which requires less maintenance when established.

2. Landscaping and related elements should be used to create and define spaces rather than fill or clutter an area with objects. Plants can be used to create enclosed spaces and to separate spaces from one another. They can also be used to direct people through outdoor spaces by visually defining and reinforcing patterns of movement.

3. Use plant material and planting design to develop a sense of order to highlight the hierarchy of spaces and buildings, to articulate the vehicular and pedestrian circulation network, and to highlight important buildings and outdoor spaces. Shrubs and hedges should be used as spatial reinforcers, screens, and accents, but they should be used cautiously to not create dangerous conditions (i.e. hedging in areas where someone could hide).

4. Plant materials serve to unify the campus, create a campus identity, define the limits of the campus, and provide educational opportunities (such as plant identification, planting design, horticulture and landscape maintenance practices).

5. Planting design should also reflect the function in which the space will serve to achieve an appropriate design. For example, large usable open spaces could be planted with lawn and canopy trees for shade, while smaller outdoor seating areas could be landscaped with accent trees, shrubs, and groundcover.

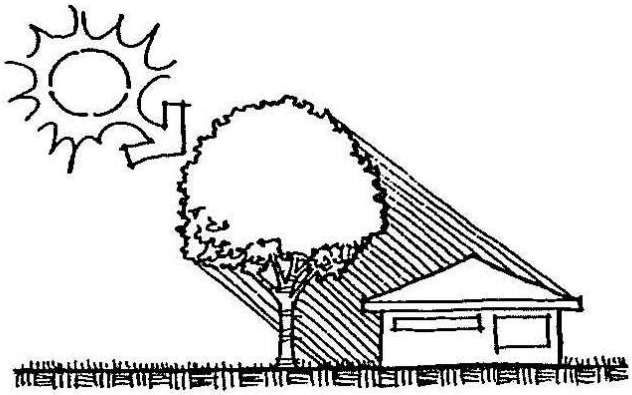
6. Planting arrangements should use repetition, rhythm and simplicity to create a sense of continuity and order. Repetition can be achieved through the consistent use of a species-specific tree or shrub. Rhythm can be achieved through the regular spacing of trees or shrubs. Simplicity can be achieved through the careful selection of a limited planting palette as opposed to plantings consisting of one of everything (which leads to fragmented composition). Together, these elements create emphasis and unity and are especially effective in articulating main circulation routes, through street tree planting.

7. Plant selection should consider form, ultimate size, color and texture. Form deals with the shape and size of the plant material. Ultimate size deals with the height and spread of canopy for plant material (as described in the Plant List). Color and texture improve the appearance of an area by providing contrast and interest to the landscape. Large masses of a single color are generally more satisfying than a heterogeneous blend of many colors. The texture of a plant material can be either coarse or fine, depending on the relative texture of plants immediately adjacent to it. Rough or thorny textures in a screen or hedge planting can serve a functional use when the hedge serves a security purpose.

8. Use accent tree plantings and flowering ornamental shrubs to highlight entries, major plazas, open spaces, buildings, and circulation paths.

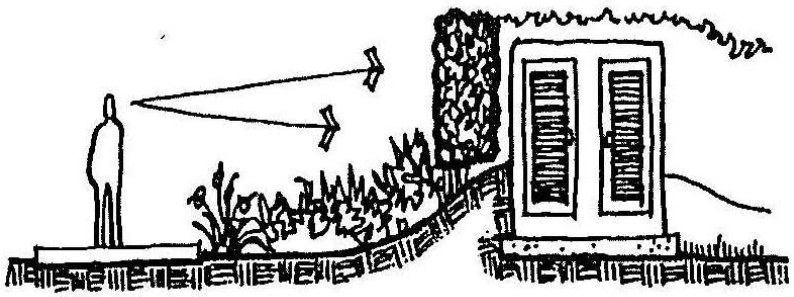
9. Landscaping around buildings should reflect the contextual landscape around the building, while creating individuality and diversity at the entries (through the use of accent plantings and hardscape elements).

10. Tree locations near buildings should be considered as a means of cutting down on cooling requirements.



11. Planting should be used to break up stark walls and paving. For example, vines and other plantings should be used to enrich large blank wall areas, especially retaining walls.

12. Use plant materials to control erosion and screen unsightly areas such as transformers, service and maintenance areas and dumpsters.



13. Plantings should incorporate the use of native plant materials which are well-adapted to Hilo's climatic conditions.

9.5.2 Irrigation

Due to the rainy climate, the site of the proposed campus receives abundant precipitation throughout the year. This will normally provide a sufficient supply of water for the vegetation on campus (similar to conditions on the UH-Hilo campus). Therefore, irrigation may not be needed, except for new plantings or areas under covered walkways. A combination of quick coupling valves and hose bibs should be installed allowing for hand watering or washing down (paths, etc.), in selected areas of the campus, as required.

9.5.3 Signage

A signage master plan should be developed to provide necessary information to visitors and the campus community and project a positive campus image with a unified system of high quality graphics. In general, the signage, through size, color, and materials, should help to identify each building block element and the hierarchy within each element (such as the spine vs. paths). The types of signs shall include but not be limited to the following:

- Gateway signs and key corner monuments.
- Major and secondary entry signs and monuments.
- Campus directional signs.
- Building identification signs.
- Traffic control signs. • Temporary signs.
- Identification plaques and signs for botanical gardens.

Signs should be developed to incorporate graphics such as colors, logo, or a combination of both. Site furnishings should also be selected or designed to match or complement the graphics chosen for the signs. This will help establish a theme or pattern throughout the campus.

9.5.4 Exterior Lighting and Site Furniture

Exterior lighting and site furniture should be incorporated to provide for the necessary functional requirements and also contribute toward the enhancement of campus image. A campus lighting plan should be developed to provide a coordinated system of lighting which is compatible with adjacent structures, walkways, site furniture and open spaces.

Exterior Lighting

1. A standard street light fixture should be adopted for all campus roadways.

2. A standard on-site lighting fixture should be adopted for the campus.

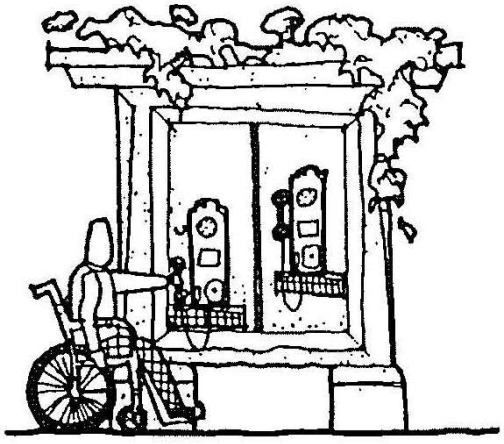
3. A standard path light should be adopted for all campus paths.

4. A standard fixture should be employed in all parking lots.

Site Furniture

Site furnishings should reflect Hawaii CC's setting, architectural character, and climatic conditions. These should be part of a coordinated system, which reinforces the image and identity of the campus. These elements should provide excellence in design, functional appropriateness, durability, and evoke a sense of quality at the pedestrian scale of experience.

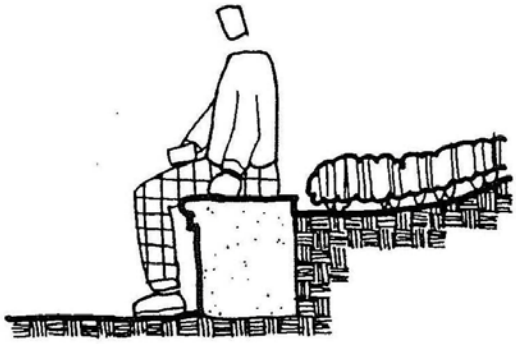
1. Provide furnishings which encourage use by individuals with disabilities.



2. The design and choice of furnishings should reinforce a unified and consistent visual vocabulary. New site furnishings should contribute to the identity and image of a space. The design and choice of furnishings should visually relate to the design of adjacent buildings and structures.

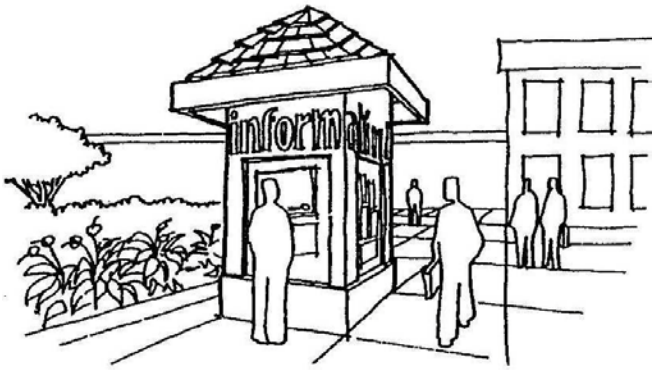
3. Locate seating oriented to users for interaction, studying, waiting and resting. These include areas adjacent to paved walkways, entry ways, and plazas, near the tops and bottoms of major stairs and ramps, at bus stops and at other locations deemed appropriate by anticipated need and use.

4. Encourage the incorporation of amenable sitting surfaces integral with building and site design such as ledges on planter areas, sitting steps, retaining wall setbacks, slabs cantilevered from walls, and raised podiums in plazas.



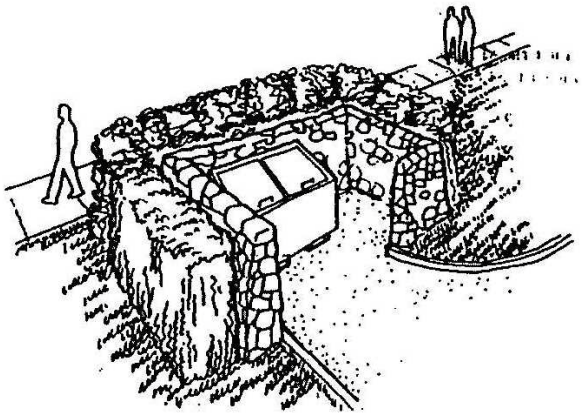
7. Bus shelters should be located where warranted by the degree of use, be adjacent to paved sidewalks and not impede pedestrian traffic. The shelters should provide protection from inclement weather conditions typical at the Hawaii CC campus.

8. Provide information kiosks and notice centers only in areas where they are needed and have a high exposure to pedestrian traffic. Kiosks should be designed to fulfill their intended function while blending compatibly with their setting. At major gathering areas, kiosks should provide general student information, a map of the campus, event notices, and other miscellaneous information.



9. Trash receptacles should be attractive and of a consistent design, placed strategically throughout the campus. They should be combined with other site furnishings to create consolidated, multi-purpose facilities where possible.

10. Dumpsters should be located convenient to the facility they serve. All rubbish cans and dumpster areas should be screened on at least three sides by an opaque fence or wall of sufficient height to block views of the containers. Plant material and/or earth berms should be used for general screening of the trash collection areas from view of main roads, sidewalks and building entrances.



11. In major plazas and open spaces, moveable tables and chairs should be provided to allow for interaction, eating and studying while providing flexibility in arrangement.

12. Banners should be used along the pedestrian spine and at plazas to create identity and pride for the school programs, and a more festive collegiate atmosphere.

13. Bollards should be used to define edges and to separate vehicular and pedestrian uses. Bollards may also be used for this function.

14. Planter pots should be used as accents along the pedestrian spine and walkway, at gathering areas and at entries to certain buildings.

15. Drinking fountains should be provided throughout the campus.

16. Environmental Art (sculptures) should be incorporated to assist in place identity for the open space areas and to make art an integral part of the campus image.

9.6 ARCHITECTURAL STYLE AND CHARACTER

9.6.1 Intent

Architectural design guidelines are required in order to promote a strong sense of harmony and unity among the buildings on campus and to encourage all projects to be planned and constructed as part of an ongoing process based on the concepts of the Master Plan. It is not the intent to dictate a rigid architectural style for buildings, but rather to guide the development of the campus towards unification in architectural character derived from:

- a sensitivity to climatic factors,
- building scale,
- complementary colors and materials,
- and siting relationships within the campus.

Project boundaries should be identified for new building projects in order to assure that the goals of the master plan are fully realized and that incremental development occurs in a logical fashion. Locating boundaries for new projects also reinforces the desire to plan the entire campus as a whole, rather than allow piecemeal development which could leave leftover, unplanned spaces.

The Ultimate Site Plan identified the building footprints to accommodate program elements for an ultimate population of 2,000 FTE. These footprints were sited in relation to the public spaces (as discussed in earlier sections), in order to encourage activity (campus life) among the campus community. The desired massing and scale relationships of these footprints are further discussed in the following guidelines.

It is the intent of these architectural design guidelines to establish a contextual vocabulary with which buildings would be designed to support and enrich the overall vision of the campus as described in the Ultimate Site Plan report. The following sections address building form (scale and massing), building elements, materials, and color, as details which should be guided by an adherence to the objectives of the master plan.

9.6.2 Building Orientation

Building orientation impacts overall lighting and cooling costs. Buildings should maximize northern/southern exposures. This will optimize the opportunities for natural daylighting. South facing roofs at the appropriate pitch will maximize photovoltaic panel efficiency. Minimizing eastern and western exposures will reduce cooling cost, as it is difficult to shade from the sun.

9.6.3 Building Form

The following guidelines are provided to set a standard for consistency in the massing and scale of new campus buildings, while allowing freedom for the design of each building to meet the needs of its projected program requirements.

1. The building form should be largely dictated by the building function/program, environmental and building systems, construction cost, and architectural aesthetics.

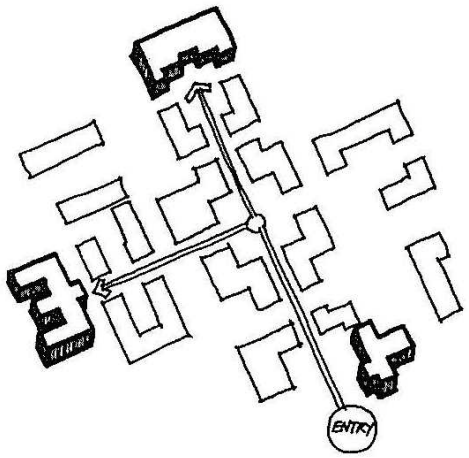
2. The building should try to maximize the efficiencies of natural daylighting and ventilation.

3. Desirable features for new buildings include: arcades, articulated building facade character, sloping roof lines, well defined entry orientations, and ground floor activity access.

4. Develop a unified campus vernacular of pitched roofs and a horizontal building emphasis.

5. Heights should be limited to a maximum of four stories, with all of the shop facilities limited to one story.

6. Buildings of monumental scale should be avoided, and instead a few "landmark" buildings should be strategically located among a backdrop of harmonious campus buildings.



7. Locations for "landmark" buildings include the combined administration, academic support and parking building at the Main Campus Entry. The Student Services Building would also be categorized as a "landmark" building due to its prominent location at the campus's entry. These buildings should be designed with a higher level of articulation, to be focal points on the campus against the backdrop of other buildings.

8. Employ simple geometric forms for the majority of campus facilities.

9. Express the basic building layers (i.e. base, midsection, and roof) of each facility.

10. Solar shading and reveals in fenestration should be employed to articulate building scale and mitigate climatic factors.

11. The building form should express any visually interesting ground level activities, such as specialty classrooms, meeting rooms, possibly art studios or computer labs (for

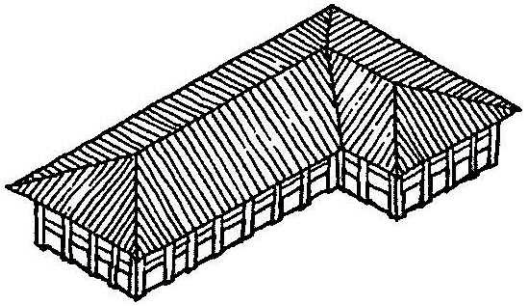
information, interest, discovery, and nighttime security), especially along the main pedestrian walkways and at the central plaza location.

12. Mechanical penthouses should be integrated into the overall architectural expression and contextual vocabulary.

9.6.4 Building Elements

A hierarchy of building elements should be used for the different types of campus facilities.

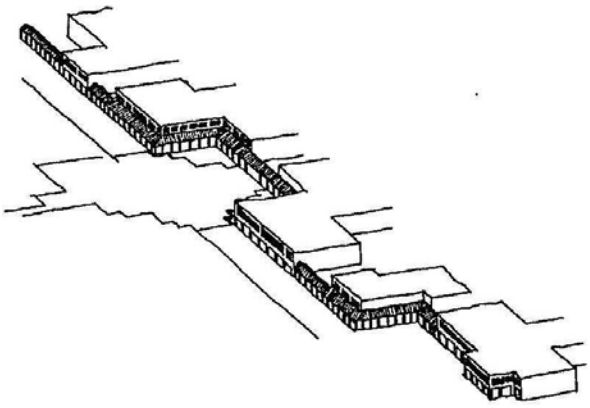
1. ROOFS: With building heights limited to four stories, the roofs become an important building design element throughout the campus. Rooflines in the academic core area should slope within a 2:12 to 12:12 range in response to Hilo's rainy climate. Overhangs should be designed to provide protection of the vertical building surfaces.



Although flat roofs are acknowledged to be inappropriate for the climate, it is accepted that they may be mandated for some of the larger shop and support facilities due to the building size and roof top mechanical and/or venting requirements. Where possible sloped roofs should be integrated to minimize the areas of flat roofs. The design of these roofs must be carefully evaluated and detailed to ensure a watertight, low maintenance life cycle. Roof top mechanical equipment must be screened from adjacent buildings and from pedestrian viewpoints.

Roof with wide overhangs that provide shading from the direct solar gains are recommended. South facing at appropriate pitch will maximize PV panel efficiency.

The Student Services Building (Bldg N) adjacent to the Marae/Piko Entry Plaza and Building J (Career & Technical including Culinary) should be designed with an integral covered outdoor space. The design of these roofs should encourage the flexible use of the space, allow for natural daylighting, and enhance the entry experience into the building.



2. FACADES: The two buildings (Bldg P and Bldg N) located at the main entry to the campus demand a higher level of complexity in their detailing, massing, and use of materials. Not only must these facades address first time visitors entering the campus in automobiles, but the everyday campus community will become very familiar with the buildings from a pedestrian's viewpoint.

The four buildings (Bldgs O, L, K and J) radiating south from the Marae/Piko Entry Plaza should also employ a higher level of articulation in their facades through the use of reveals, mullions, setbacks, and changes of plane. The covered walkway system is to be incorporated into these facades, and therefore the users will be brought into close contact with the detailing of these buildings' facades, more so than with the other, background, buildings on the campus.

Buildings which are set back from the covered walkway system should relate to adjacent outdoor spaces by promoting an indoor/outdoor relationship vital to the effectiveness of the pedestrian walkway system and open space network. .

3. ENTRIES: Building entries should be clearly defined, provide a gracious welcome, and relate to the covered pedestrian walkway system. Building entries should be designed with enough space to accommodate the peak loads of groups gathering between classes.

Multiple entries into the support facilities should be provided to facilitate their flexible and varied interior functions. A hierarchy of entries should be incorporated into these facilities to provide the user with an easily identifiable circulation system.

9.6.5 Materials

Building materials must be appropriate for the location (rainy climate) and context (pedestrian oriented campus) of the site. Academic architecture should express the enduring quality of education which can be reinforced through the use of materials with long term durability.

1. The primary material palette for exterior walls should be natural, enduring materials such as stone, masonry, concrete and steel.

2. The detailing of stone and masonry walls must take into account the wet climate and the desire for low maintenance requirements.

3. Concrete may take many different forms including: lightweight concrete panels, cast in place, or precast panels.

4. CMU should be carefully evaluated before considering it as an exterior wall material. In its natural state, concrete masonry units (CMU) seem ill suited for the image of a friendly, inviting campus. CMU is only to be used as an exterior wall material when covered with plaster or skim coating, or when a specialty type/architectural finish is used as an accent material. Ground face unit with integrally colored CMU may be used.

5. Accent materials may be used as a design element relating to specific program requirements or for contextual reasons based on the location of a building on the site (i.e. buildings grouped around a common open space may have a common accent material to enhance the identity of the space). These accent materials may include bluestone, lava rock, coral, tile, or wood in selected areas.

6. Wood is not recommended as a main exterior building material due to its high maintenance characteristics. When protected from moisture it may be used as an accent material or as trim.

7. Glazed areas should be encouraged, when properly designed, to maximize the use of daylighting within the facilities. However, large areas of curtain wall are appropriate only in facades with special significance and when carefully detailed and well protected with overhangs.

6. Roof materials: Sloped roofs should be metal with either standing seams, batten seams, or flat seams.

7. Materials should be evaluated for their regional contextualism, their ability to withstand the climate, and their overall low maintenance survival rate.

9.6.6 Colors

Color is an important device for providing continuity and overall unity throughout the campus. Based on the use of natural materials the overall palette for the buildings should be earth tones, with natural finishes, and the use of paint only where the exterior wall finish material may require it for preservative treatment. Roof color selection should take into consideration of heat island effect based on the slope of the roof. This contributes to the energy efficiency of the building by tempering thermal loads in the occupied zones through shading, reflectance and insulation.

1. A limited palette of neutral colors will help unify the campus while allowing the form of the buildings to vary as may be required based on their function. These light, neutral colors work well in Hilo, to brighten what can be mostly overcast vistas, and to provide a warm and inviting character for the campus.

2. A consistent use of roof colors will provide a connection between buildings (and therefore a strong sense of place), even though their functions, and therefore their forms, may vary from instructional classroom facilities, to office buildings, and technical shop buildings.

3. Accent colors, should be used to develop place identity within the different areas of the campus. These colors should be stronger, and the palette more vivid since they will occur in much less quantity.

4. The stand alone covered walkway system should have its own variation of roof color and earth toned wall (support columns) palette. This would reinforce the organizational quality of the Pedestrian Covered Walkway and the walkway down to the shop facilities.

9.6.7 Design Considerations

While planning individual building projects, designers must consider accessibility issues, along with the requirements for building security, operations, ease of maintenance, and fire safety.

Accessibility

1. Provide for all buildings to be accessible per the requirements of the Americans with Disabilities Act. Each facility must have an entrance on to an accessible route connecting all of the facilities on the site.

2. Refer to the Barrier-Free Access Plan for the proposed accessible pedestrian route, passenger drop-off locations, and accessible parking locations to be provided for the campus.

3. All multi-story facilities must include elevators, per ADA building code requirements. If buildings are connected at the second level, their design may include a shared elevator, if all other code requirements and life safety conditions are met.

Security

1. Maximize opportunity for building lighting to illuminate adjacent exterior areas for nighttime

2. Design service and loading areas to be visually screened against unsightliness, but not totally cut off from views for security concerns.

3. Allow for meeting rooms in buildings to be grouped together. This will allow for efficient after-hour use safety while other areas of the building are secured.

Lighting

1. Provide for necessary functional requirements and also contribute toward the enhancement of campus image.

2. Concealed source lighting should be emphasized and designed to feature architectural elements and building form rather than fixtures themselves.

3. Spacing of trees and exterior light fixtures should be considered in relation to one another.

Service/Ease of maintenance

1. Locate service docks away from major building entries. Include a shared elevator, if all other code requirements and life safety conditions are met.

2. Screen service dock areas with landscape or solid walls, or by recessing the areas into building envelopes.

3. Locate mechanical equipment for ease of maintenance and provide visual screening and weather protection.

4. Building design should consider ease of maintenance for the regular upkeep of the facility, along with periodic servicing needs.

Fire Safety:

1. Design all new buildings to meet fire safety standards and local Codes.

2. Provide access for emergency vehicles to all new buildings, and throughout the campus per County of Hawaii regulations.

9.7 LEED™ AND SUSTAINABLE CAMPUS CONCEPTS

LEED™ is an internationally recognized certification system that measures how well a building or community performs across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship or resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED™ provides building owners and operators a concise framework for identifying and implementing practical and measureable green building design, construction, operations and maintenance solutions. [1]

The LEED™ rating system contains prerequisites and credits in five categories: Sustainable Site Planning, Water Efficiency, Energy Efficiency and Atmosphere, Materials and Resources, and Indoor Environmental Quality. Registered projects can achieve levels of Certified, Silver, Gold, and Platinum.

The intent of LEED™ is to create a great built environment, providing the highest level possible of operational efficiency, as well as comfort and support for the users.

Construction, renovations and alterations of any Manono Campus buildings or site amenities are to conform to the following Sustainable Guidelines.

- The work shall integrate building materials and methods that promote environmental quality, economic vitality, and social benefit through the construction and operation of the built environment.
- The resulting project shall meet at minimum the State of Hawai'i mandated LEED™ Silver rating level, with higher rating levels encouraged.
- All future work should comply with the most current version of the LEED™ rating system and state requirements.

In efforts to preserve the natural resources of the state of Hawai'i, buildings should be designed responsibly. New construction and campus renovations should consider efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, and reinforcement of natural systems, while integrating the design approach and cultural awareness.

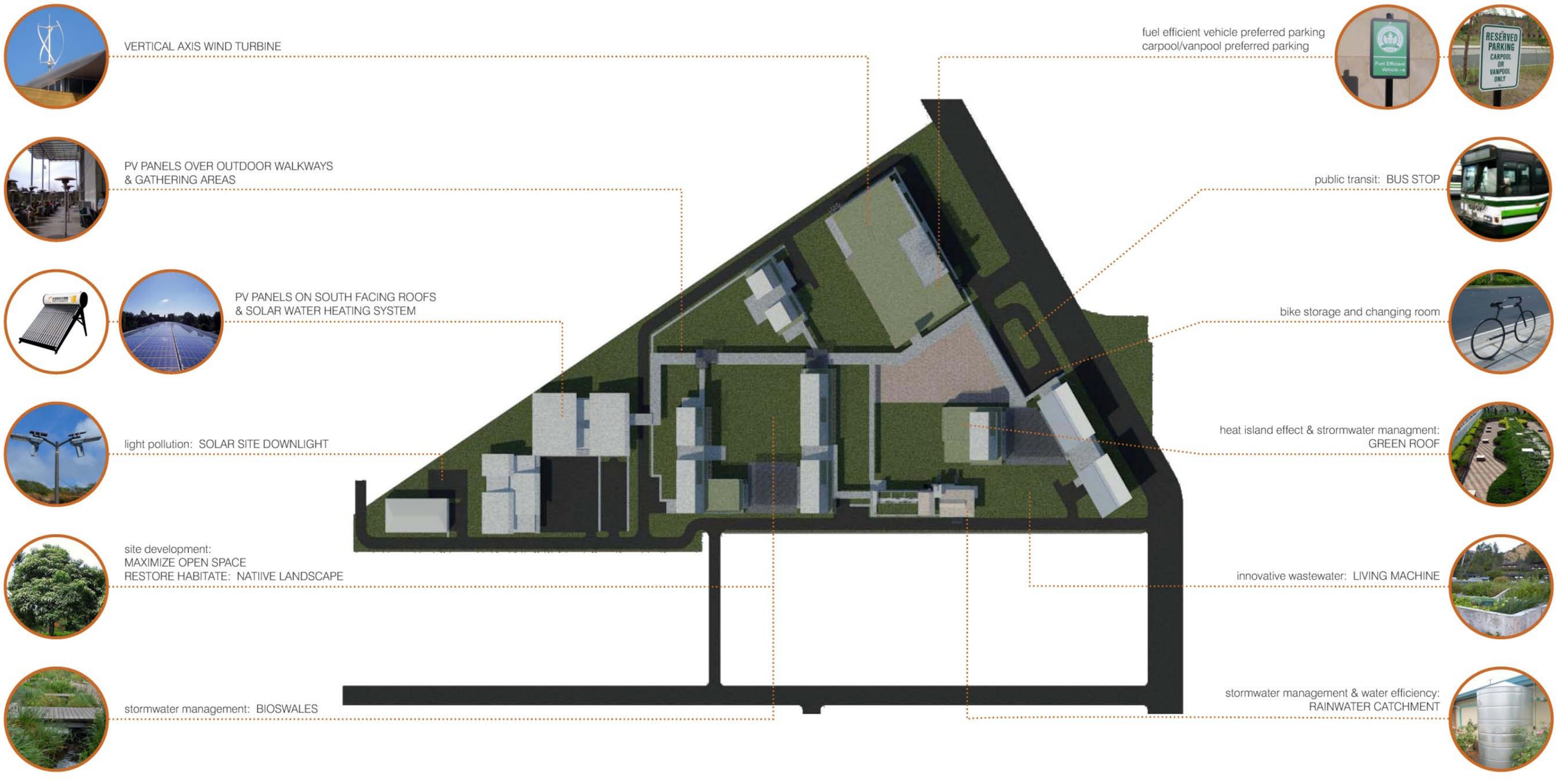
For best results, sustainability should be clearly articulated as a guiding principle for project development, and incorporated into the project from the earliest stages. Sustainable design principles affect all phases of project development, from design, construction, operations and maintenance, and demolition and disposal. Specific to the Hilo climate and the Manono Campus site, buildings should focus their sustainable efforts on conserving water, natural daylighting, harvesting sunlight for energy, and – most importantly – passive design cooling and shading strategies. Incorporating these sustainable aspects into the design concepts will help the project achieve the minimum LEED Silver rating level, with higher rating levels encouraged.

Figure 19 suggests a number of concepts that can be incorporated to improve campus sustainability.

[1] United States of America. U.S. Green Building Council. What LEED is. 2008. <http://www.usgbc.com>

[This page intentionally left blank]

Figure 19
Sustainable Campus Concepts



[This page intentionally left blank]

10.0 IMPLEMENTATION AND TRANSITION PLAN

10.1 GENERAL

A phasing plan that will allow the Manono Campus to be developed in a rational and orderly manner was formulated based on the Ultimate Plans. The phasing plan allows for continuing development as enrollment and program requirements increase and funding becomes available. The initial phase of campus development will be in the northwestern corner and southern portions of the site. Successive development phases will gradually move farther away from the corner. The incremental development will be divided into four (4) phases. Table 11 summarizes the major site planning components and total built-up area at each phase. The figures in Table 12 reflect the square footages represented in Section 2.0 Program Requirements, Table 1 and Section 7.0 Ultimate Plans. For a breakdown of the square footage to be developed in each phase, refer to Table 12.

10.2 PHASING

10.2.1 Phase 1:

1. Demolition of eleven (11) structures, including classroom buildings, vocational shops, computer lab, and nursing lab portables. The nursing lab portables could potentially be relocated to another location on campus.

2. New Building P (Administration, Learning Commons, Parking). Administration could move into this building and convert the existing administration buildings into classroom space or use this as a transitional building and house the displaced classrooms.

3. New Transition Shop Building (Ultimate Building A). The displaced vocational shops will move in here.

4. Existing main campus entry turnaround to remain.

5. Existing surface parking lot (at main entry) to remain with some modification.

6. New West Perimeter Road, Mid Campus Road, and partial South Perimeter Road to access the new Transitional Shop Building.

7. Reduction of the existing surface parking lot (south lot) and new access to the Mid Campus Road.

8. Modification to some existing parking, roadways, sidewalks to accommodate the new components.

10.2.2 Phase 2:

1. Demolition of seven (7) structures, including classroom buildings, office building, administration, student services and cafeteria.

2. Proposed Kawili Street realignment.

3. New main campus entry and turnaround, Marae/Piko entry plaza.

4. Two (2) New Buildings: Building N (Student Services) and Building L (Humanities). All displaced spaces will move into these two buildings.

5. New covered area adjacent to the Building N to serve as eating area for the displaced cafeteria.

6. Modification to some existing parking, roadways, sidewalks to accommodate the new components

10.2.3 Phase 3:

1. Demolition of one (1) structure, classroom Bldg 381B MPA.

2. Convert the Transition Shop Building to Building A (Carpentry + Construction Academy).

3. New Building B (Elec. Maint. & Inst. Tech + Electronics) and Building C (Operational and Maintenance).

4. New East Perimeter Road, East Access Entry, South Campus Entry, and the completion of the South Perimeter Road.

5. Modification to some existing parking, roadways, sidewalks to accommodate the new components.

10.2.4 Phase 4: Ultimate Site Plan

1. Demolition of nine (7) structures, including vocational shops, classroom and office buildings.

2. Three (3) New Buildings: Building J (C&T + Culinary Arts), Building K (English, Math/Science), and Building O (Liberal Arts + PS). All displaced spaces to move into the appropriate locations.

3. New covered walkway and covered area.

Table 11
Transition Plan

Existing	Phase 1	Phase 2	Phase 3	Phase 4
Bldg 379A - OCET/FAO	Demo			
Bldg 385A - Apprenticeship				
Bldg 385B - Ceramics				
Bldg 385C - Art				
Bldg 386A - Science Lab/Storage				
Bldg 386B - Carpentry				
Bldg 387 - IT/Computer Lab				
Bldg 394 - UHH Art Classrooms				
Bldg 395 - UHH Art Dept				
Nursing Lab Portables *				
Bldg 378 - Chanc Off, Admin	Bldg 378 - Chanc Off, Admin	Demo		
Bldg 379 - Student Services	Bldg 379 - Student Services			
Bldg 380 - AEC	Bldg 380 - AEC			
Bldg 381 - Liberal Arts	Bldg 381 - Liberal Arts			
Bldg 381A - NA PUA NO'EAU	Bldg 381A - NA PUA NO'EAU			
Bldg 382 - Culinary, Cafeteria	Bldg 382 - Culinary, Cafeteria			
Bldg 397 - Business Office	Bldg 397 - Business Office			
Bldg 381B MPA	Bldg 381B MPA	Bldg 381B MPA	Demo	
Bldg 388 - Classrooms, Offices	Bldg 388 - Classrooms, Offices	Bldg 388 - Classrooms, Offices	Bldg 388 - Classrooms, Offices	Demo
Bldg 389 - Aux Shop	Bldg 389 - Aux Shop	Bldg 389 - Aux Shop	Bldg 389 - Aux Shop	
Bldg 389A - Hula Studio	Bldg 389A - Hula Studio	Bldg 389A - Hula Studio	Bldg 389A - Hula Studio	
Bldg 390 - Carpentry	Bldg 390 - Carpentry	Bldg 390 - Carpentry	Bldg 390 - Carpentry	
Bldg 391 - Electrical/Electronics	Bldg 391 - Electrical/Electronics	Bldg 391 - Electrical/Electronics	Bldg 391 - Electrical/Electronics	
Bldg 392 - Services	Bldg 392 - Services	Bldg 392 - Services	Bldg 392 - Services	
Bldg 393 - Ag/Early Childhood	Bldg 393 - Ag/Early Childhood	Bldg 393 - Ag/Early Childhood	Bldg 393 - Ag/Early Childhood	
Bldg Z - Hale Aloha - Nursing Skills	Bldg Z - Hale Aloha - Nursing Skills	Bldg Z - Hale Aloha - Nursing Skills	Bldg Z - Hale Aloha - Nursing Skills	Bldg Z - Hale Aloha - Nursing Skills
	Bldg P - Admin, Learning Commons, Parking, Sus Learn Ctr	Bldg P - Admin, Learning Commons, Parking, Sus Learn Ctr	Bldg P - Admin, Learning Commons, Parking, Sus Learn Ctr	Bldg P - Admin, Learning Commons, Parking, Sus Learn Ctr
	Transition Shops	Transition Shops	Transition Shops	Transition Shops
		Bldg L - Humanities	Bldg L - Humanities	Bldg L - Humanities
		Bldg N - Student Services	Bldg N - Student Services	Bldg N - Student Services
			Bldg B - Elec. Maint. & Inst. Tech & Electronics	Bldg B - Elec. Maint. & Inst. Tech & Electronics
			Bldg C - Operations & Maintenance	Bldg C - Operations & Maintenance
				Bldg J - C&T + Culinary Arts
				Bldg K - English + Math/Sci
				Bldg O - Liberal Arts + PS

* Assume the Nursing Lab Portables are moved to another site.

[This page intentionally left blank]

Table 12
Transition Plan

Bldg		GSF	PH1	PH2	PH3	PH4
Original Campus						
378	Administration	3,474		(3,474)		
379	Student Services	6,955		(6,955)		
379A	OCET/FAO	4,480	(4,480)			
380	AEC	12,066		(12,066)		
381	Liberal Arts	12,150		(12,150)		
381A	Na Pua No'eau	2,688		(2,688)		
381B	MPA	1,700			(1,700)	
382	Culinary, Cafeteria	20,844		(20,844)		
383	Nursing	16,637				
385A	Apprenticeship	2,688	(2,688)			
385B	Ceramics	1,344	(1,344)			
385C	Art	1,344	(1,344)			
386A	Science Lab/Storage	5,978	(5,978)			
386B	Carpentry	3,023	(3,023)			
387	IT/Computer LAB	5,978	(5,978)			
388	Classrooms, Offices	6,477				(6,477)
389	Aux Shop	5,978				(5,978)
389A	Hula Studio	1,081				(1,081)
390	Carpentry	8,418				(8,418)
391	Electrical/Electronics	15,183				(15,183)
392	Services	8,243				(8,243)
393	Ag/Early Childhood	9,506				(9,506)
394	UHH Art Classrooms	4,845	(4,845)			
395	UHH Art Dept	4,467	(4,467)			
396A	Portable	2,240	(2,240)			
396B	Portable	1,680	(1,680)			
397	Business Office	2,380	0	(2,380)	0	0
	Change		(38,067)	(60,557)	(1,700)	(54,886)
	Net (cumulative)	171,847	133,780	73,223	71,523	16,637
New Campus, less surface areas (Yards)						
A	Carpentry/Constr Acad		20,845			
B	Electrical Tech/Electronics				15,650	
C	Planning, Operations & Maint				9,801	
J	Career & Tech					59,763
K	Liberal Arts					61,233
L	Liberal Arts			39,165		
N	Student Services			57,683		
O	Liberal Arts					30,629
P	Admin, Acad Spt, OCET		55,592	0	0	0
	Change		76,437	96,848	25,451	151,625
	Net (cumulative)		76,437	173,285	198,736	350,361
Manono Campus (cumulative)		171,847	210,217	246,508	270,259	366,998

10.3 SCHEDULE

The proposed transition plan schedule shown is Table 13 is based on a number of assumptions.

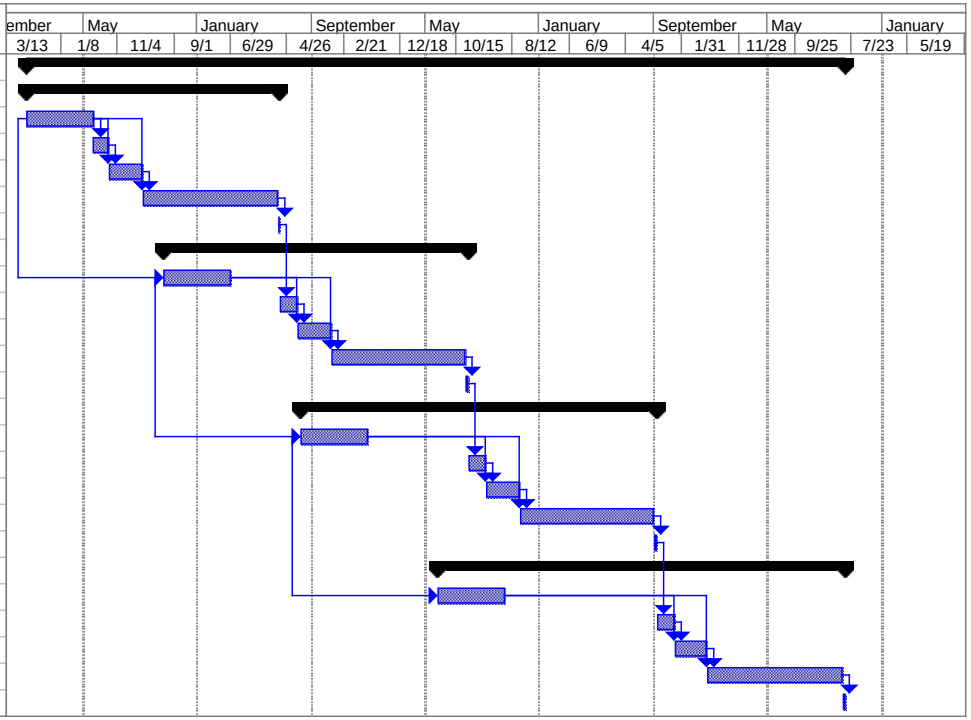
- The earliest expected start date is Jul, 2011.
- Duration of an activity is shown on a calendar month basis; not a working day basis; days shown in **bold** are not on a calendar basis but on a working day basis, which does not include weekends. It is best to look at dates to understand the duration of a Phase.
- Within a phase, activities are expected generally to be performed "in-sequence."
- Design for Phases 2-4 starts two years after the start of the design of the previous phase.
- Relocation activities for Phases 2-4 do not begin until new areas in the previous phase are occupied. This allows for plenty of float during design.
- The workload in terms design, demolition and new construction for each phase is different. However, the durations shown for design, demolition and new construction are the same, which means the durations are independent of the workload. This means, in order to meet the schedule, additional resources will be deployed to accomplish greater workload.

The expected duration for each phase and the total project are as follows:

Phase 1	1,352 calendar days or approx. 3.7 years
Phase 2	1,626 calendar days or approx. 4.5 years
Phase 3	1,903 calendar days or approx. 5.2 years
Phase 4:	2,175 calendar days or approx. 6.0 years
Total project	4,367 calendar days or approx. 12.0 years

Table 13
Transition Plan Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Start**	**3119 days**	**Tue 7/5/11**	**Mon 6/19/23**	
2	**Phase 1**	**966 days**	**Tue 7/5/11**	**Wed 3/18/15**	
3	Design Site and Buildings (2 Bldgs)	12 emons	Tue 7/5/11	Fri 6/29/12	
4	Relocate Activities	3 emons	Sat 6/16/12	Fri 9/14/12	3FS-0.5 emons
5	Demolish Replacement Buildings (11 Bldgs)	6 emons	Fri 9/14/12	Wed 3/13/13	4,3
6	Construct Site and Buildings (2 Bldgs)	24 emons	Wed 3/13/13	Tue 3/3/15	5,3
7	Occupy New Areas	0.5 emons	Tue 3/3/15	Wed 3/18/15	6
8	**Phase 2**	**1161 days**	**Fri 7/5/13**	**Sun 12/17/17**	
9	Design Site and Buildings (2 Bldgs)	12 emons	Fri 7/5/13	Mon 6/30/14	3SS+24 emons
10	Relocate Activities	3 emons	Wed 3/18/15	Tue 6/16/15	7
11	Demolish Replacement Buildings (7 Bldgs)	6 emons	Tue 6/16/15	Sun 12/13/15	10,9
12	Construct Site and Buildings (2 Bldgs)	24 emons	Sun 12/13/15	Sat 12/2/17	11,9
13	Occupy New Areas	0.5 emons	Sat 12/2/17	Sun 12/17/17	12
14	**Phase 3**	**1360 days**	**Fri 7/3/15**	**Thu 9/17/20**	
15	Design Site and Buildings (2 Bldgs)	12 emons	Fri 7/3/15	Mon 6/27/16	9SS+24 emons
16	Relocate Activities	3 emons	Sun 12/17/17	Sat 3/17/18	13
17	Demolish Replacement Buildings (1 Bldgs)	6 emons	Sat 3/17/18	Thu 9/13/18	16,15
18	Construct Site and Buildings (2 Bldgs)	24 emons	Thu 9/13/18	Wed 9/2/20	17,15
19	Occupy New Areas	0.5 emons	Wed 9/2/20	Thu 9/17/20	18
20	**Phase 4**	**1554 days**	**Wed 7/5/17**	**Mon 6/19/23**	
21	Design Site and Buildings (3 Bldgs)	12 emons	Wed 7/5/17	Sat 6/30/18	15SS+24 emons
22	Relocate Activities	3 emons	Thu 9/17/20	Wed 12/16/20	19
23	Demolish Replacement Buildings (7 Bldgs)	6 emons	Wed 12/16/20	Mon 6/14/21	22,21
24	Construct Site and Buildings (3 Bldgs)	24 emons	Mon 6/14/21	Sun 6/4/23	23,21
25	Occupy New Areas	0.5 emons	Sun 6/4/23	Mon 6/19/23	24

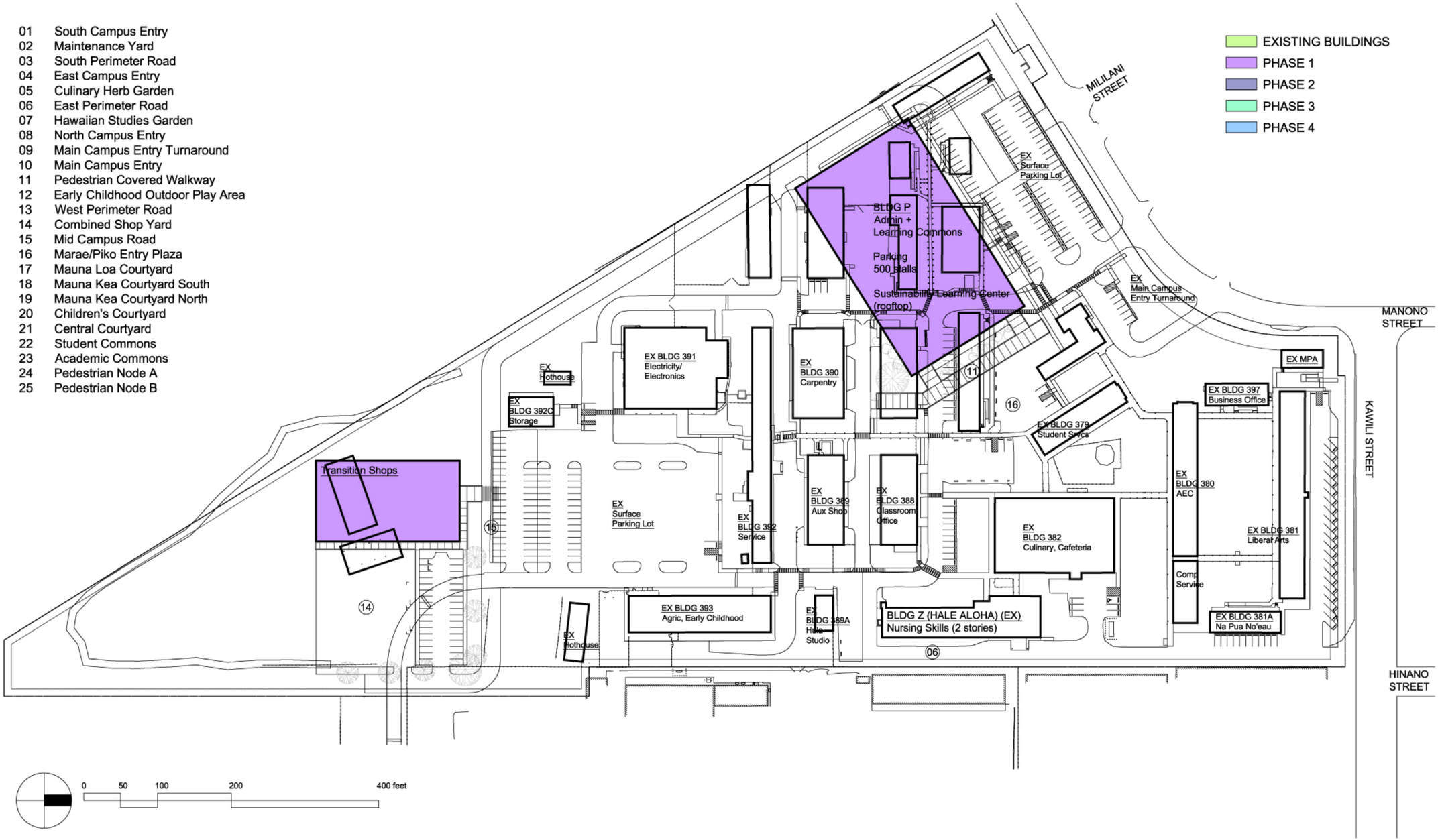


[This page intentionally left blank]

Figure 20
Transition Plan, Existing

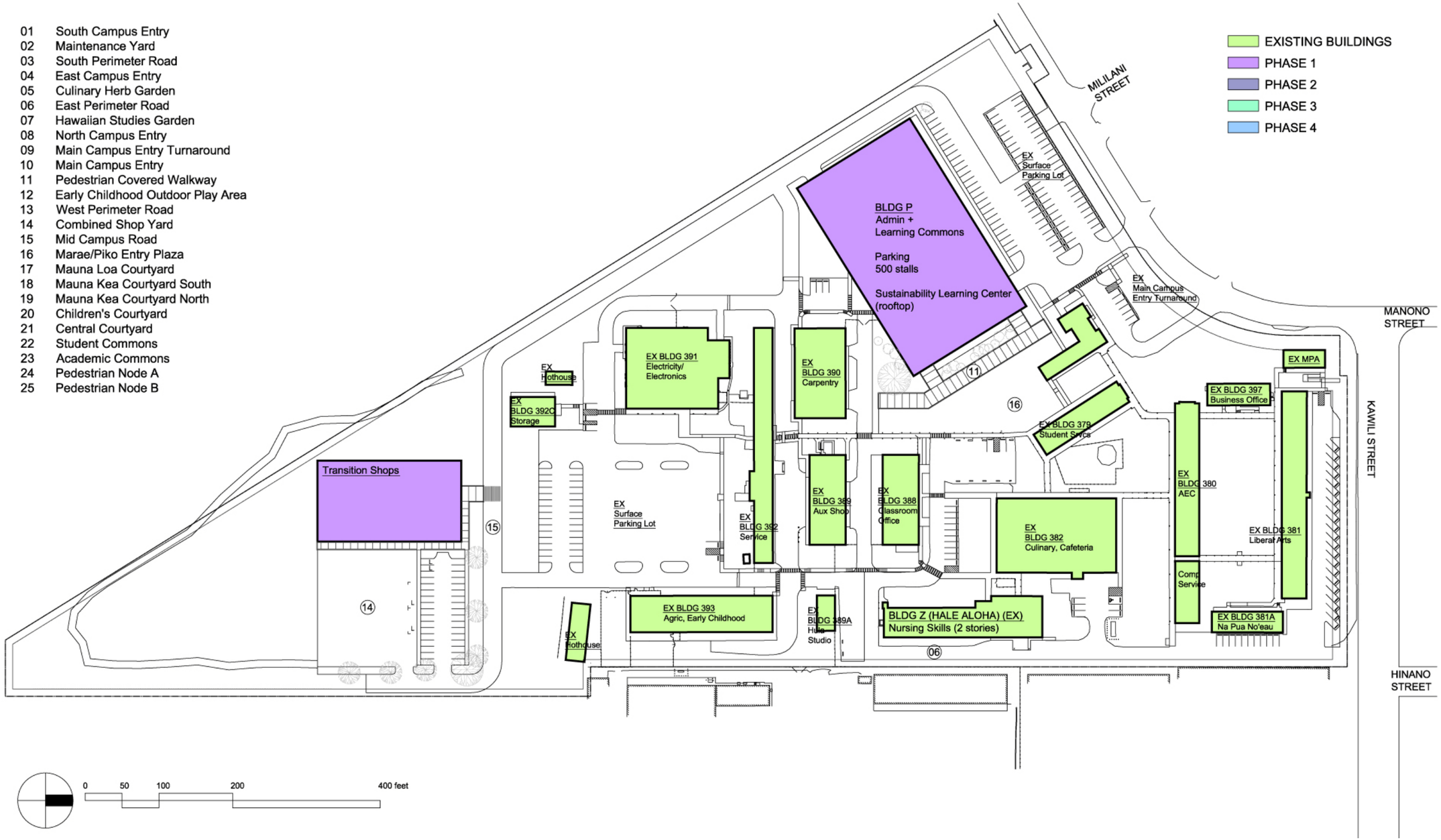
[This page intentionally left blank]

Figure 21
Transition Plan, Phase 1Activity



[This page intentionally left blank]

Figure 22
Transition Plan, Phase 1End State

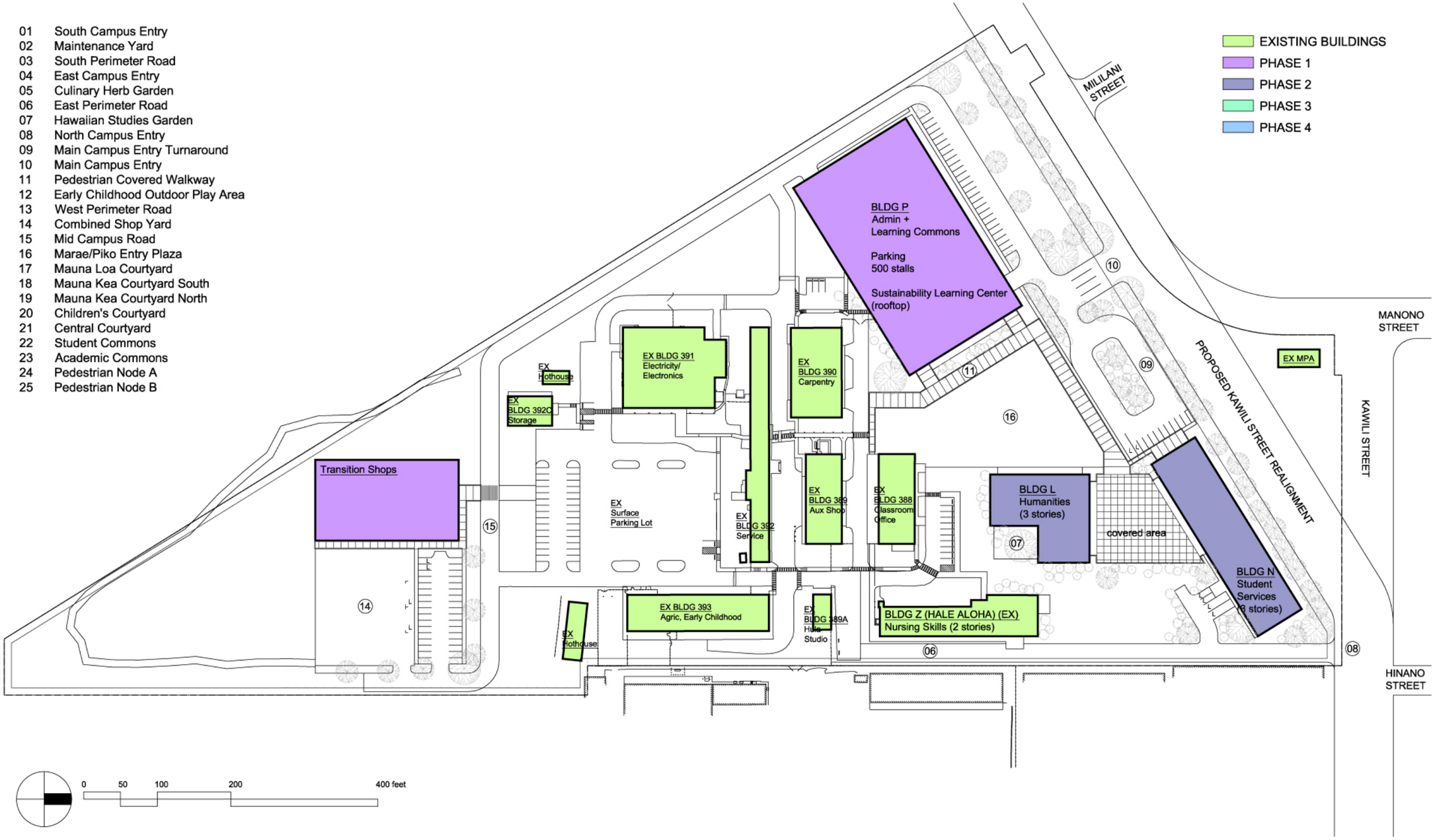


[This page intentionally left blank]

Figure 23
Transition Plan, Phase 2 Activity

[This page intentionally left blank]

Figure 24
Transition Plan, Phase 2 End State



[This page intentionally left blank]

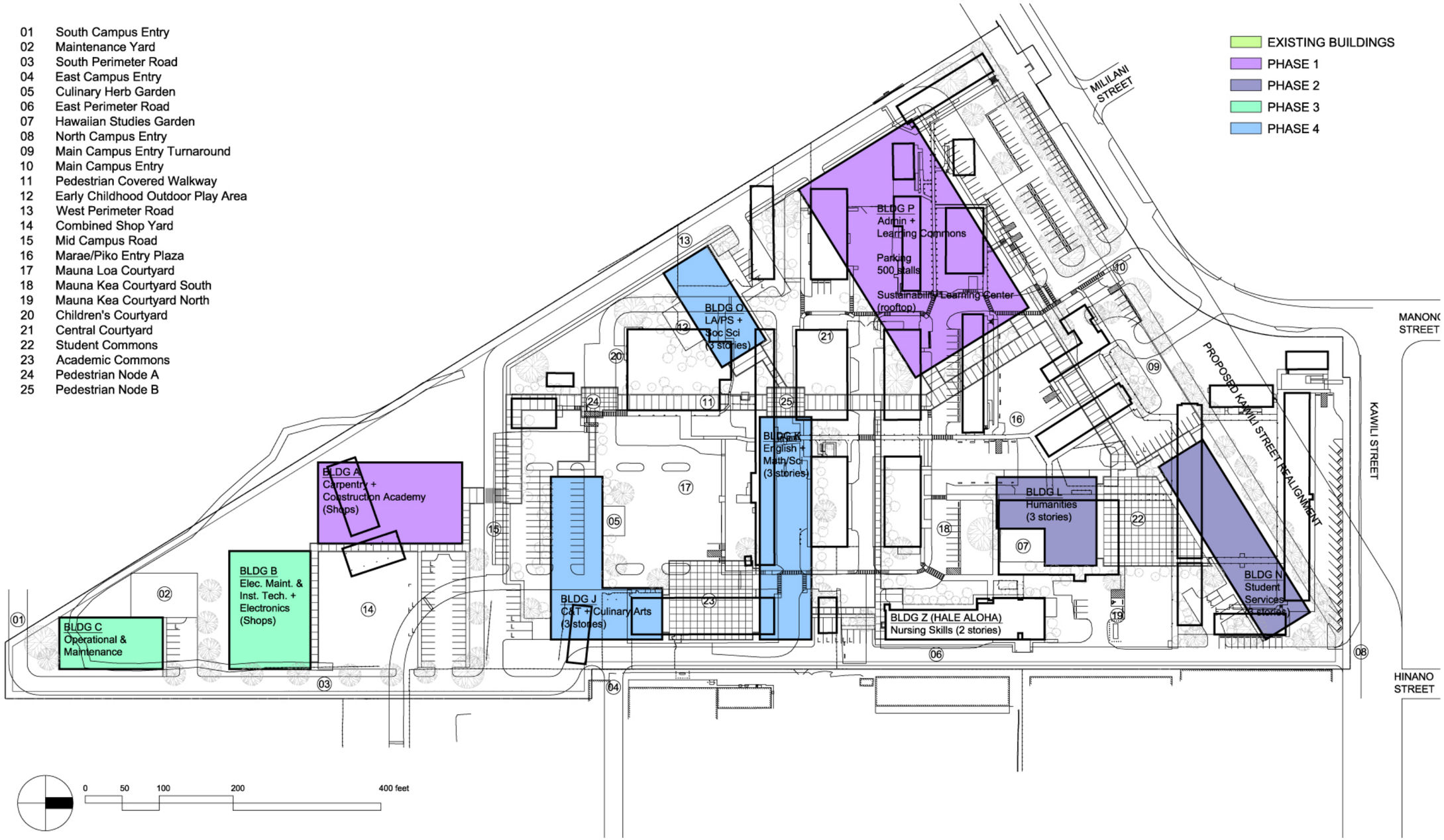
Figure 25
Transition Plan, Phase 3 Activity

[This page intentionally left blank]

Figure 26
Transition Plan, Phase 3 End State

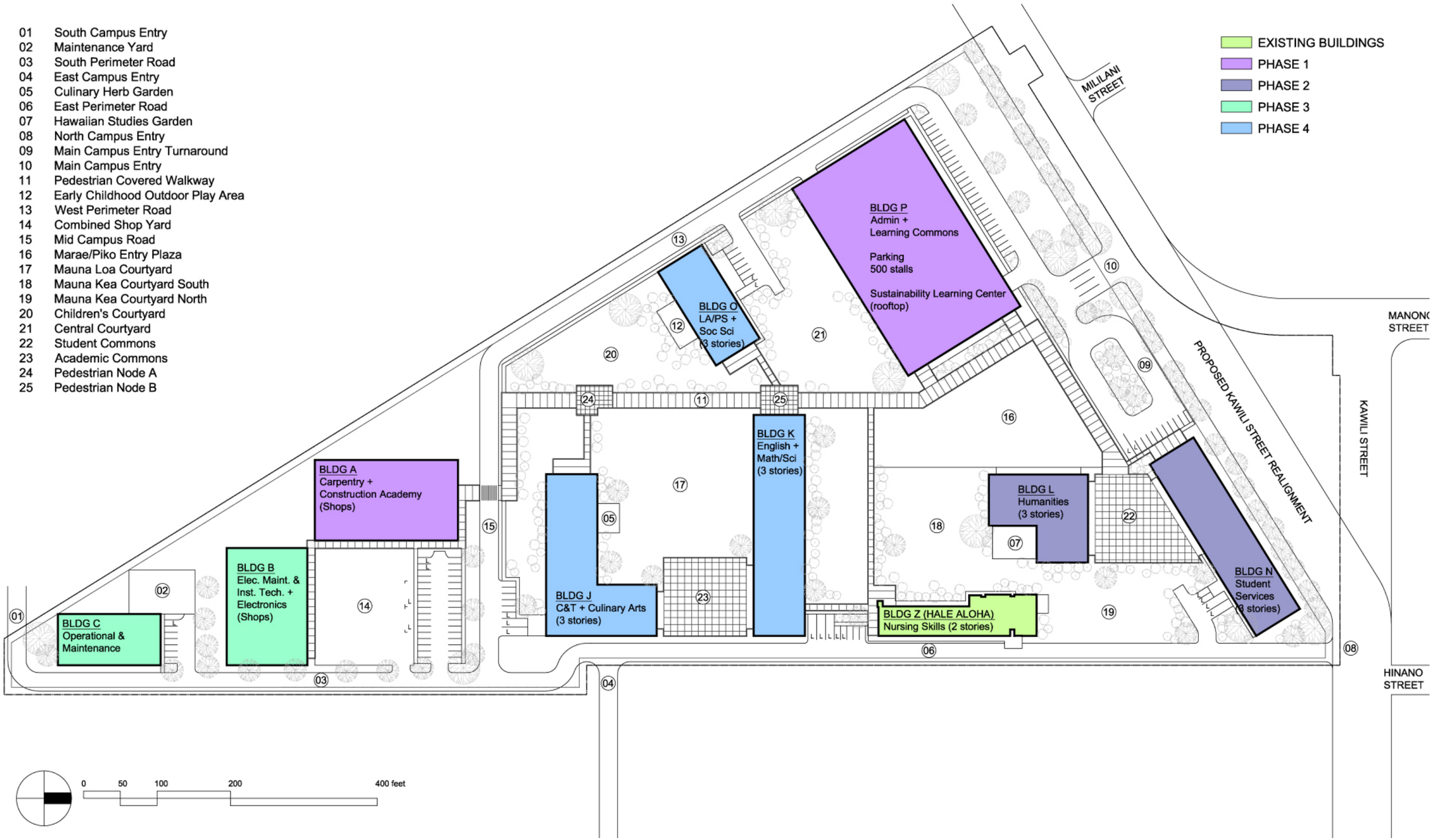
[This page intentionally left blank]

Figure 27
Transition Plan, Phase 4 Activity



[This page intentionally left blank]

Figure 28
Transition Plan, Phase 4 End State



[This page intentionally left blank]

11.0 COST ESTIMATE

A cost estimate (see Table 14 below) was derived based on the Ultimate Site Plans. The estimate is separated into the four (4) development phases described in Chapter 10. The cost estimate indicates the total cost magnitude of the Manono campus as proposed in this LRDP. These figures can be used for phasing and implementation purposes during the actual design and construction of the campus.

The probable costs expressed in the estimate are based on historic records of educational facilities designed and recently built in Hawai'i. The costs are based on August, 2010, dollars and include no escalation for inflation or other increases in construction costs. The building areas in square feet were derived from the Educational Specifications prepared for the Manono Campus and include a 25 to 50 percent factor for circulation and utilities. Actual costs after the design is completed may vary from these initial opinions.

The costs do not include permit, development and legal fees, costs for utility hookups and development of off-site utilities, land acquisition. A fifteen percent (15%) contingency has been added to cover unforeseen conditions during implementation and transition.

Table 14
Cost Estimate

	Phase 1	Phase 2	Phase 3	Phase 4	Total	%
DESIGN	5,861,000	2,324,000	611,000	3,639,000	12,435,000	
Contingency (15%)	879,150	348,600	91,650	545,850	1,865,250	
Total, Design	6,740,150	2,672,600	702,650	4,184,850	14,300,250	5.4%
DEMOLITION	1,142,000	1,817,000	51,000	1,647,000	4,657,000	
Contingency (15%)	171,300	272,550	7,650	247,050	698,550	
Total, Demolition	1,313,300	2,089,550	58,650	1,894,050	5,355,550	2.0%
NEW CONSTRUCTION - BUILDINGS						
Occupied	33,632,000	42,613,000	11,198,000	66,716,000	154,159,000	
Parking	43,362,000	0	0	0	43,362,000	
Subtotal, Buildings	76,994,000	42,613,000	11,198,000	66,716,000	197,521,000	
Contingency (15%)	11,549,100	6,391,950	1,679,700	10,007,400	29,628,150	
Total, Buildings	88,543,100	49,004,950	12,877,700	76,723,400	227,149,150	86.4%
NEW CONSTRUCTION - SITE INFRASTRUCTURE	5,153,000	3,675,000	2,460,000	2,626,000	13,914,000	
Contingency (15%)	773,000	551,000	369,000	394,000	2,087,000	
Total, Exterior Improvements	5,926,000	4,226,000	2,829,000	3,020,000	16,001,000	6.1%
Total Probable Cost	102,522,550	57,993,100	16,468,000	85,822,300	262,805,950	100.0%

Total Probable Cost By Category With Contingency Included						
DESIGN	6,740,150	2,672,600	702,650	4,184,850	14,300,250	5.4%
DEMOLITION	1,313,300	2,089,550	58,650	1,894,050	5,355,550	2.0%
NEW CONSTRUCTION - BUILDINGS	88,543,100	49,004,950	12,877,700	76,723,400	227,149,150	86.4%
NEW CONSTRUCTION - SITE INFRASTRUCTURE	5,926,000	4,226,000	2,829,000	3,020,000	16,001,000	6.1%
	102,522,550	57,993,100	16,468,000	85,822,300	262,805,950	100.0%

Total Probable Cost By Category With Contingency Separate						
DESIGN	5,861,000	2,324,000	611,000	3,639,000	12,435,000	4.7%
DEMOLITION	1,142,000	1,817,000	51,000	1,647,000	4,657,000	1.8%
NEW CONSTRUCTION - BUILDINGS	76,994,000	42,613,000	11,198,000	66,716,000	197,521,000	75.2%
NEW CONSTRUCTION - SITE INFRASTRUCTURE	5,153,000	3,675,000	2,460,000	2,626,000	13,914,000	5.3%
	89,150,000	50,429,000	14,320,000	74,628,000	228,527,000	87.0%
Contingency	13,372,550	7,564,100	2,148,000	11,194,300	34,278,950	13.0%
	102,522,550	57,993,100	16,468,000	85,822,300	262,805,950	100.0%

12.0 REFERENCES

[1] Hawaii Community College Long Range Development Plan, March 1996, prepared by PBR HAWAII and Kajioka Okada Yamachi Architects.

[2] Hawaii Community College Downtown Relocation Analysis, May 1998, prepared by Helber Hastert & Fee, Planners.

[3] Hawaii Community College Manono Campus Study, August 1998, prepared by PBR Hawai'i and Kajioka Yamachi Architects.

[4] Hawaii Community College Long Range Development Plan Update, May, 2003, prepared by PBR HAWAII and Wesley R. Segawa & Associates.

[5] Amendment No. 1 to Real Estate Development Services Agreement for Hawai'i Community College Hilo Manono Campus

[6] University of Hawaii Unfunded Deferred Repairs and Maintenance Listing for 2007, 2008 and 2009 and associated working papers including inspection notes, inspection reports, plans, projections and calculations, etc., for Hawaii Community College facilities.

[7] University of Hawai'i Facility Renewal Reinvestment Study, prepared by The Pacific Partners Consulting Group and including Report of Study Findings dated April 2008 and all associated working papers including inspection notes, inspection reports, plans, projections and calculations, etc., for Hawaii Community College facilities.

[8] Manono Campus Educational Specifications Update: Final Report, August 31, 2010, prepared by Hawaii Campus Developers, LLC.

[9] UHCWH LRDP Update, Jan 2010

[This page intentionally left blank]

13.0 LIST OF PREPARERS

Company Name	Area of Responsibility
Hawai'i Campus Developers	Program Requirements Project Management Cost Estimating
Urban Works	Architecture
WKM Landscape Architecture.	Landscape Architecture
R.M. Towill Corp.	Civil Engineering
Nokamura, Oyama and Associates	Electrical Engineering and Communications Systems
Notkin Hawaii, Inc.	Mechanical Engineering

[This page intentionally left blank]

14.0 LISTINGS OF FIGURES AND TABLES

14.1 FIGURES

14.2 TABLES

Appendix A

BUILDING PROGRAM REQUIREMENTS BY SPACE TYPE (GROSS SQUARE FEET), PAGE 1

	1-FS	2-CR	3-LB	4-Shop	5-AC	6-YD	Total
A, 1-Story, Carp + Constr Acad							
II. Academic Affairs							
C. Career & Technical							
5. Applied Technical Education							
f. Carpentry	540	750		10,688	8,038		20,015
g. Construction Academy	280				550		830
A, 1-Story, Carp + Constr Acad, YD							
II. Academic Affairs							
C. Career & Technical							
5. Applied Technical Education							
f. Carpentry						6,500	6,500
B, 1-Story, EMIT + Electronics							
II. Academic Affairs							
C. Career & Technical							
5. Applied Technical Education							
i. Elec. Maint. & Inst. Tech.	720	750		5,200	4,750		11,420
j. Electronics	180	750		1,225	2,075		4,230
B, 1-Story, EMIT + Electronics, YD							
II. Academic Affairs							
C. Career & Technical							
5. Applied Technical Education							
i. Elec. Maint. & Inst. Tech.						4,000	4,000
C, 1-Story, Plgn, Ops & Mnt							
IV. Administrative Affairs							
D. Planning, Opns & Maint.							
1. Office of Planning, Operations & Maintenance							
(blank)	336				5,415		5,751
2. Janitorial Services							
(blank)	1,440						1,440
3. Groundskeeping							
(blank)	480				1,650		2,130
4. Maintenance							
(blank)	240						240
5. Security							
(blank)	240						240
C, 1-Story, Plgn, Ops & Mnt, YD							
IV. Administrative Affairs							
D. Planning, Opns & Maint.							
1. Office of Planning, Operations & Maintenance							
(blank)						4,200	4,200
J, 3-Story, C&T + Culinary							
II. Academic Affairs							
C. Career & Technical							
1. Dean's Office, C&T							
a. Departmental Spaces	383				1,080		1,463
3. Business Education & Technolology							
a. Divisional Spaces	1,848	6,000	2,250		3,114		13,212
4. Culinary							
a. Divisional Spaces	2,064	1,800		11,250	13,514		28,628
5. Applied Technical Education							
a. Divisional Spaces	240				2,085		2,325
b. Agriculture	432	1,500	4,500		900		7,332
c. Arch, Engr & CAD	864	900	3,240		1,800		6,804
J, 3-Story, C&T + Culinary, YD							
II. Academic Affairs							
C. Career & Technical							
4. Culinary							
a. Divisional Spaces						1,200	1,200
K, 3-Story, English + Math/Sci							
II. Academic Affairs							
D. Liberal Arts & Public Service							
3. English							
a. Divisional Spaces	3,456	13,500	2,250		2,907		22,113

BUILDING PROGRAM REQUIREMENTS BY SPACE TYPE (GROSS SQUARE FEET), PAGE 2

	1-FS	2-CR	3-LB	4-Shop	5-AC	6-YD	Total
4. Math & Natural Science							
a. Divisional Spaces	4,320	15,000	9,000		1,446		29,766
b. Natural Sciences					9,354		9,354
L, 3-Story, Humanities							
II. Academic Affairs							
D. Liberal Arts & Public Service							
5. Humanities							
a. Divisional Spaces	3,144	9,000			2,301		14,445
b. Digital Media Arts			1,800				1,800
c. Fine Arts				5,400	6,450		11,850
d. Foreign Language					180		180
e. Hawaiian Studies	1,440	4,500	2,250	1,800	900		10,890
L, 3-Story, Humanities, YD							
II. Academic Affairs							
D. Liberal Arts & Public Service							
5. Humanities							
e. Hawaiian Studies						1,200	1,200
N, 3-Story, Student Services							
III. Student Services							
A. Dean's Office, Student Services							
1. Dean's Office, Student Services							
(blank)	383				5,082		5,465
B. Enrollment Services							
1. Staff							
(blank)	1,440						1,440
2. Admissions & Records							
(blank)					5,400		5,400
3. Financial Aid							
(blank)					3,360		3,360
C. Counseling and Student Life							
1. Staff							
(blank)	3,528						3,528
2. Bridge Programs							
(blank)					4,050		4,050
3. Counseling & Guidance/Human Dev							
(blank)					5,610		5,610
4. Special Programs							
(blank)					20,580		20,580
D. Contract Food Service							
1. CFS							
(blank)					8,250		8,250
O, 3-Story, LA&PS, Soc Sci, Early Childhood							
II. Academic Affairs							
D. Liberal Arts & Public Service							
1. Dean's Office, LA & PS							
a. Departmental Spaces	743				2,340		3,083
2. Social Science							
a. Divisional Spaces	2,808	10,500	2,250		3,021		18,579
b. Early Childhood Ed.	672		2,250		6,045		8,967
O, 3-Story, LA&PS, Soc Sci, Early Childhood, YD							
II. Academic Affairs							
D. Liberal Arts & Public Service							
2. Social Science							
b. Early Childhood Ed.						1,800	1,800
P, 1-Story, Combined Parking & Other							
I. Office of Chancellor							
A. Office of Chancellor							
1. Office of Chancellor							
(blank)	495				2,100		2,595
2. Recruitment							
(blank)	336						336
II. Academic Affairs							
A. Office of Vice Chancellor, Academic							

BUILDING PROGRAM REQUIREMENTS BY SPACE TYPE (GROSS SQUARE FEET), PAGE 3

	1-FS	2-CR	3-LB	4-Shop	5-AC	6-YD	Total
1. Office of Vice Chancellor, Academic							
a. Vice Chan. Office	540				1,200		1,740
b. Coop VoTech Education	216						216
E. Academic Support							
1. Learning Center/Library							
a. Learning Commons	2,568		12,960		15,420		30,948
2. Academic Computing							
b. Support	960				2,190		3,150
3. Institutional Research							
c. Institutional Research	480						480
4. Sustainability Center							
d. Sustainability Learning Center		1,500	1,500				3,000
IV. Administrative Affairs							
A. Office of Vice Chancellor, Admin							
1. Office of Vice Chancellor, Admin							
(blank)	756				600		1,356
B. Business Office							
1. Staff							
(blank)	1,368						1,368
2. Other							
(blank)					3,750		3,750
C. Human Resources							
1. Staff							
(blank)	888						888
2. Other							
(blank)					1,200		1,200
V. Continuing Ed & Trng							
A. Administration							
1. Staff							
(blank)	503						503
2. Other							
(blank)		3,150					3,150
B. Apprenticeship							
1. Staff							
(blank)	216						216
C. Non-credit Programs							
1. Staff							
(blank)	696						696
P, 1-Story, Combined Parking & Other, YD							
V. Continuing Ed & Trng							
B. Apprenticeship							
2. Other							
(blank)						5,000	5,000
Z, 2-Story, Hale Aloha							
II. Academic Affairs							
C. Career & Technical							
2. Nursing							
a. Divisional Spaces	3,792	2,807	5,438		3,945		15,981
III. Student Services							
E. Health Ctr.							
1. Health Center							
(blank)					656		656
(blank)							
II. Academic Affairs							
C. Career & Technical							
5. Applied Technical Education							
d. Autobody Repair & Paint	540	750		11,875	4,438	4,000	21,603
e. Automotive Technology	1,080	750		12,750	5,938	4,000	24,518
h. Diesel Mechanics	360	750		3,750	12,025	4,000	20,885
k. Machine Technology	180	750		3,100	4,625	3,000	11,655
l. Welding & Sheet Metal	900	750		6,700	4,225	3,000	15,575
Grand Total	**49,093**	**76,157**	**49,688**	**73,738**	**194,557**	**41,900**	**485,131**

[This page intentionally left blank]