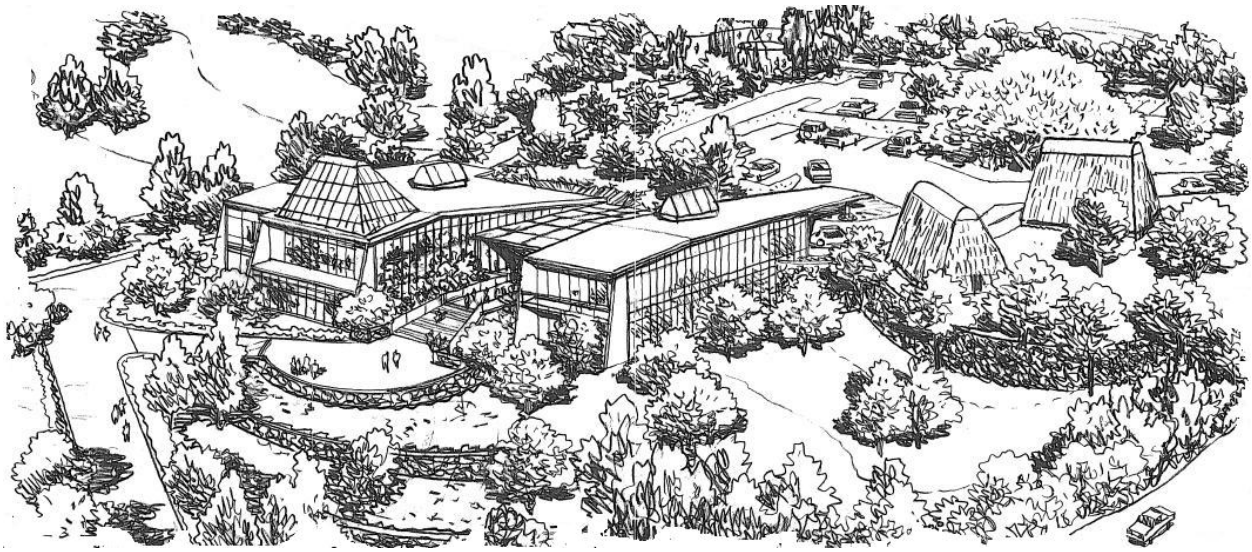
FINAL ENVIRONMENTAL ASSESSMENT

University of Hawai‘i at Hilo
College of Hawaiian Language Facilities



TMK: (3rd) 2-4-1-7
South Hilo District, Hawai‘i Island, State of Hawai‘i

April 2008

Prepared for:
State of Hawai‘i
University of Hawai‘i at Hilo
200 W. Kawili Street
Hilo, Hawai‘i 96720

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PROPOSING/
APPROVING AGENCY:

State of Hawai‘i
University of Hawai‘i at Hilo
200 W. Kawili Street
Hilo, Hawai‘i 96720

CONSULTANTS:

Geometrician Associates LLC
PO Box 396
Hilo, HI 96721

and

SSFM International, Inc.
99 Aupuni Street, Suite 202
Hilo, HI 96720

CLASS OF ACTION:

Use of State Land
Use of State Funds

This document is prepared pursuant to:

The Hawai‘i Environmental Protection Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules (HAR).

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SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The University of Hawai‘i at Hilo proposes to develop a facility to house Ka Haka ‘Ula O Ke‘elikōlani, the College of Hawaiian Language. The facilities are needed to provide expanded educational opportunities for the public through the revitalization of Hawaiian language and culture. The College was established at UH Hilo in 1997 and comprises several entities including the Hawaiian Studies Division, the Hawaiian Language Center Division, the Laboratory School Division and an Outreach Program. However, the College's offerings, which include 14 Hawaiian language courses and 17 Hawaiian studies courses, are currently spread among five existing buildings at UH Hilo and another building located six miles from campus. The new facility is being designed to accommodate the college's existing entities as well as future growth through a three-phase development schedule, with Phase 1 currently in design and the second and third phases still in the conceptual stage. The $23,800,000 Phase 1 will include a two-story building for administrative offices and classrooms and two separate one-story structures for daycare and preschool facilities, connected by covered walkways, with associated parking, utilities, and landscaping. Later phases will create Hale Kuamo‘o, an 8,600 square foot facility to house the teacher training program, curriculum development and media/telecommunications services, and Phase 3 will build graduate student facilities. The College is being developed within the Leadership in Energy and Environmental Design (LEED) Program. It will incorporate many environmentally sustainable features and will meet standards for a silver certificate in this "green building" rating system.

The project site is in an area of the University Park of Science and Technology that is currently undeveloped but slated for university expansion, with the developed UH Hilo campus to the east and University Park astronomy and agriculture facilities to the west.

Construction of the project would have a minor effect on traffic, possibly requiring only a short-term single-lane closure of Nowelo Street during grading and paving of vehicular access points. Long-term traffic impacts would be minimal and mitigated through proper design of entry/exit points. Short-term noise, air, and water quality impacts associated with grading and landscaping would be mitigated. Because the affected area of the site is greater than one acre in extent, the contractor will obtain an NPDES permit and develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to contain sediment and storm water runoff during grading and construction and minimize other construction-related effects to water quality. The site has been mostly graded or otherwise disturbed in the past, and no valuable biological or cultural resources are present. Although portions of remnant stone features associated with 20th century sugar cane agriculture are present, they have been inventoried appropriately. The State Historic Preservation Division has been consulted and has concurred that the project would have no adverse effect on archaeological resources. However, if human skeletal remains or undocumented archaeological resources are encountered during land-altering activities associated with construction, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted.

PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Project Location and Description

Project Location

The University of Hawai‘i at Hilo proposes to develop a facility for Ka Haka ‘Ula O Ke‘elikōlani, its College of Hawaiian Language, on a 4-acre portion a State of Hawai‘i property identified as TMK (3rd) 2-4-1-7, located on Nowelo Street in the State-owned University Park of Science and Technology near the main UH Hilo campus (Figures 1-3a).

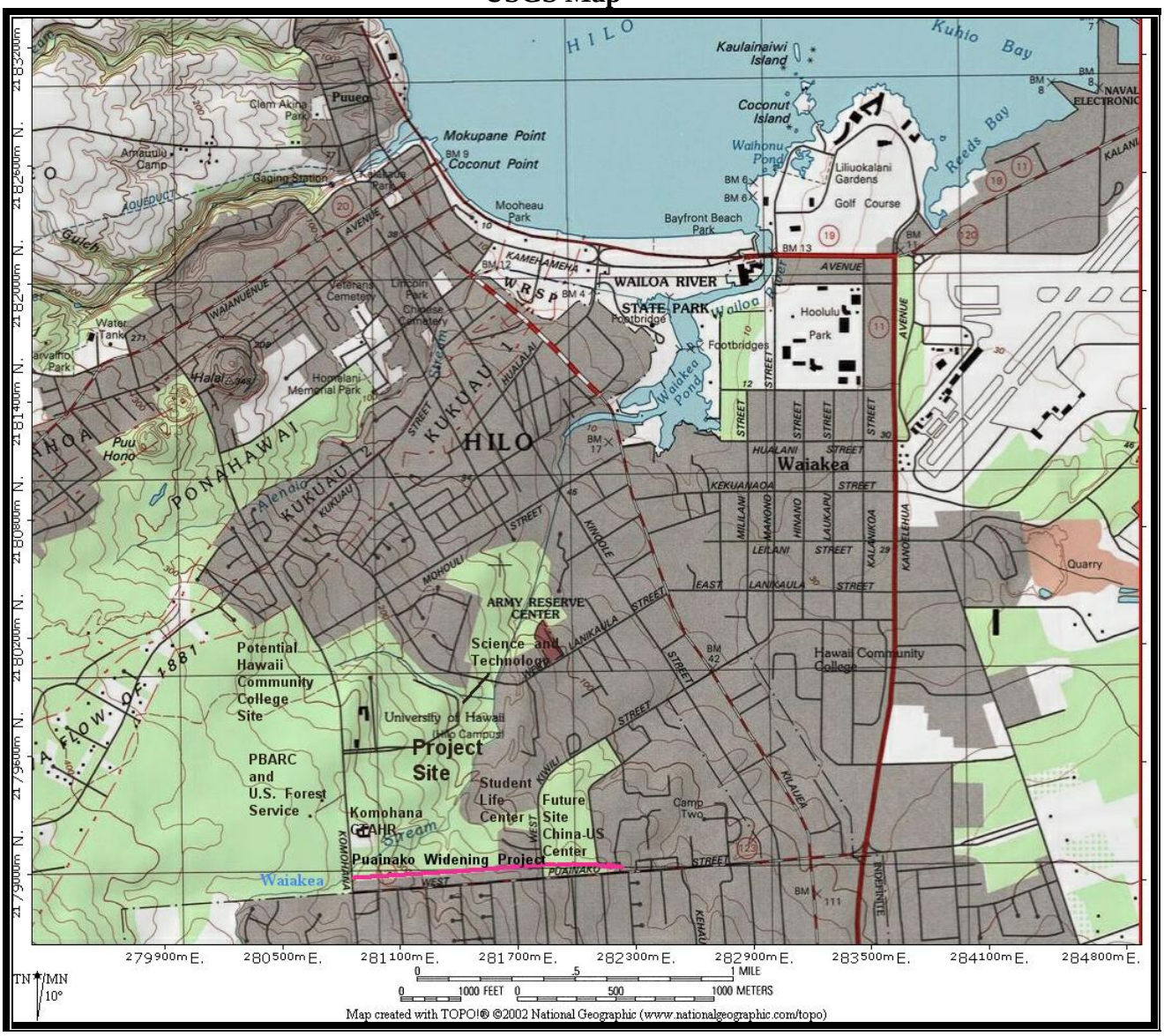
The project site is in an area of the 500-acre University Park of Science and Technology that is currently undeveloped but slated for university expansion, with the developed UH Hilo campus to the east and University Park astronomy and agriculture facilities to the west. The EIS for the original development of the entire area, including the project site (Hawai‘i State DAGS 1997), identified the project site for “UH-Hilo Expansion” but did not provide particulars on the type of development or impacts that would occur there. The site, a former sugar cane field and dairy farm pasture, is currently covered with a secondary growth of mostly alien trees and shrubs (Figure 4).

Project Description: Overall

The project consists of three phases, with Phase 1 currently in design and the second and third phases still in the conceptual stage (Figure 3b). Phase 1 will include a two-story building for administrative offices and classrooms and two separate one-story structures for daycare and preschool facilities, connected by covered walkways. The buildings will exhibit a Hawaiian architectural style and contain a total net floor space of 31,000 to 35,000 square feet (Appendix 4 provides selected schematic design figures that illustrate various aspects of Phase 1 of the project.). The project will also include a parking lot with approximately 80 stalls and a pedestrian mall connecting the facility to the main campus. Utility and landscaping improvements are also included. Phase 1 is expected to be complete by the year 2010. The current estimate for project construction excluding design is $23,800,000 to be funded by State appropriations currently pending approval.

This Environmental Assessment covers activities planned for all three phases of the project. Connected to Phase 1 on the Nowelo Street side, Phase 2 of the project will create Hale Kuamo‘o, an 8,600-square foot facility to house the teacher training program, curriculum development and media/telecommunications services (Figure 3-b). An additional pedestrian mall connecting to Nowelo Street is also conceptualized for this phase. Phase 3 will build graduate student facilities of approximately 20,000 square feet conceptually sited on the south side of Phase 1. No cost estimates or schedules are yet available for these future phases. Although design details of later phases are not yet established, the basic function, footprint, style and use characteristics have been conceptualized. Accordingly, impact analysis, including the key issues of traffic and visual impact, has been conducted. If implementation of these later phases is significantly delayed, or new impacts or circumstances arise or are discovered, UH Hilo will re-evaluate the applicability of the EA.

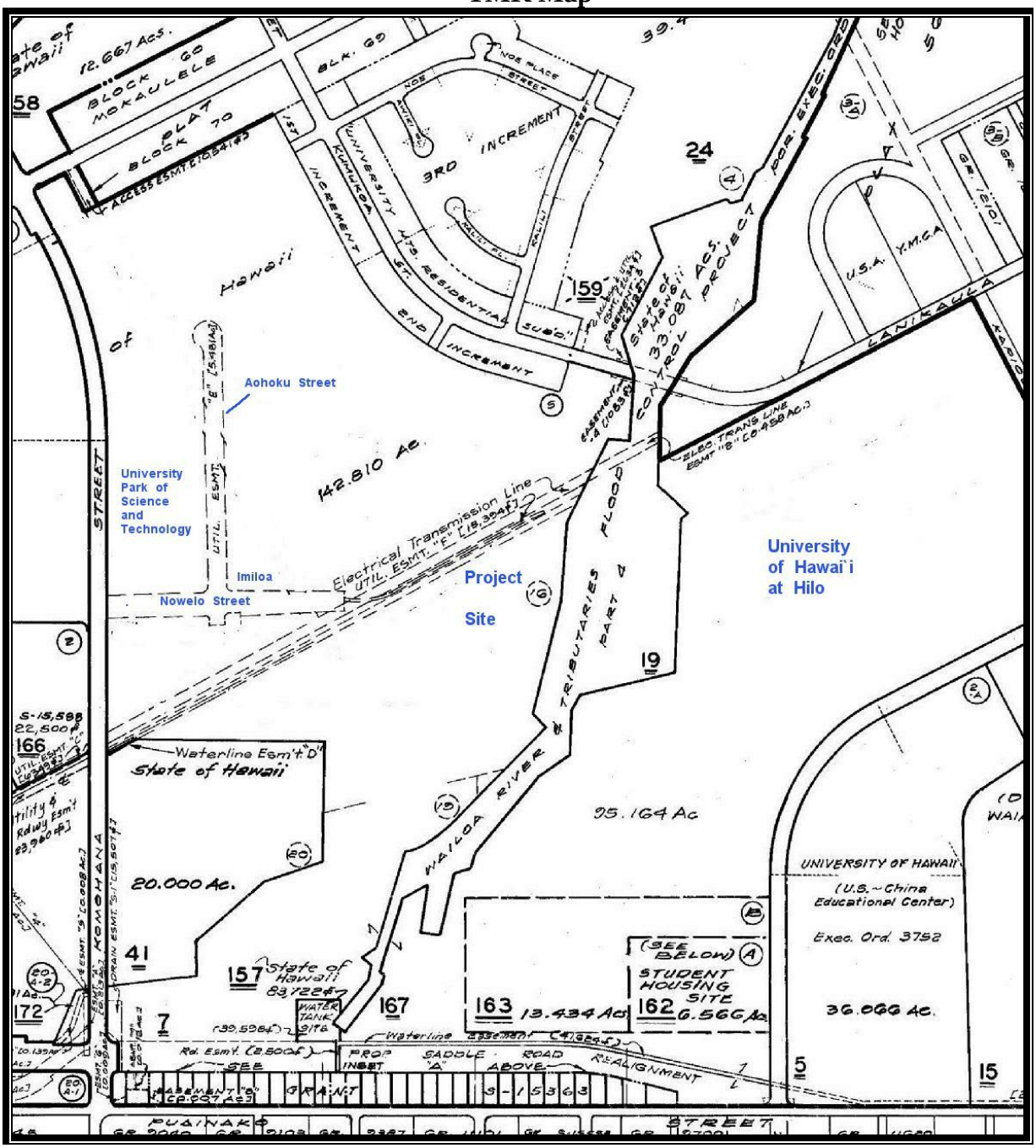
Figure 1
USGS Map



Project Description: Environmental Design

The College of Hawaiian Language is being developed within the Leadership in Energy and Environmental Design (LEED) Program. The green building rating system was developed by the U.S. Green Building Council (USGBC) to provide a set of standards for environmentally sustainable construction. Since its inception in 1994, LEED has grown to encompass over 6,000 projects in 28 countries covering 1 billion square feet of development area. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of

Figure 2
TMK Map



Portion of 2-4-001. Source: Hawaii County Real Property Tax Records

Mohouli St
Noe St
Awiki Pl
Kumukoa St
Kalili Pl
Kalili St
A'ohoku St.
Imiloa
Astronomy Center
Nowelo St.
Nowelo St.
Komohana St
UH Hilo Main Campus
(to the right)
Project Site
Waiakea Stream
N
W
E
S
0 125 250 500
Feet
Note: The background TMK Map was created by the County of Hawaii, April 2006
W Puainako St
Wainohi
Kuhilani S

SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

UHH HAWAIIAN LANGUAGE BUILDING

SITE PLAN

SCALE: 1:4,000

DATE: September 2007

Figure 3b
Project Phasing

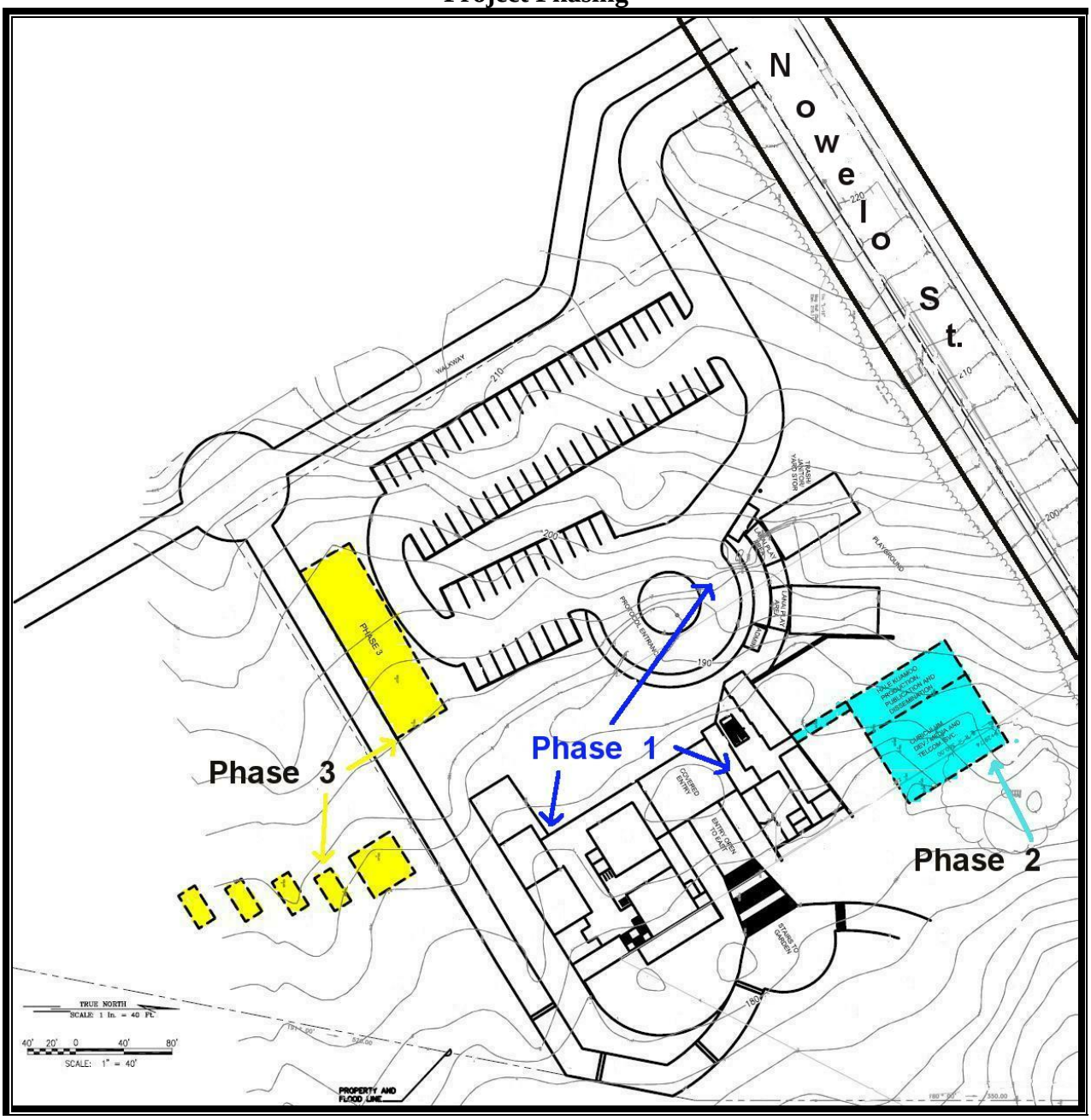


Figure 4 – Project Site Photographs

human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Although LEED buildings are more expensive to build than conventional ones, they may prove less expensive in the long run through savings in energy, maintenance, upgrade and externality (e.g., avoided costs of building new power plants and landfills).

Developments are evaluated on a set of required prerequisites and various credits. The USGBC's LEED Rating System is meant to act as a catalyst to transform the design and construction industries through the incorporation of green building strategies. Under the rating system, buildings can qualify for four levels of certification; the categories in order of point totals are certified, silver, gold and platinum. The State legislature has mandated that all new buildings be built to LEED standards that would qualify for a silver certification, and the College of Hawaiian Language will be designed to meet that.

The critical emphasis of the *Sustainable Sites* category is to minimize the effects of the development and construction processes on the local environment. Issues such as protecting and restoring the site, erosion control, storm water runoff, mitigating development of natural and agricultural areas, reducing the use of automobiles and minimizing heat islands are covered. LEED project teams focus on reducing the rate and quantity of storm water leaving the project site, as well as cleansing/reusing storm water. Strategies being explored for the College of Hawaiian Language include proper building orientation to maximize passive solar and ventilation opportunities, watershed protection, parking design optimization, habitat restoration, storm water mitigation, minimize construction imperviousness, and light pollution reduction.

The main focus of the *Water Efficiency* category is to reduce the quantity of water needed by the building and landscape to reduce the demands on municipal water supply and treatment. Strategies under consideration for this project include rainwater harvesting for sewage conveyance and irrigation, reducing the reliance on potable water; use of native and dry-adapted vegetation; and the installation of high efficiency plumbing fixtures, including waterless urinals and dual flush water closets.

The primary emphasis of the *Energy and Atmosphere* category is to reduce the environmental impact associated with excessive energy use. Strategies for this section include establishing energy efficiency goals and systems with optimized performance. This section also encourages the use of renewable or alternative energy sources in addition to supporting ozone protection protocols. Extensive use of solar tube skylighting for administrative and classroom spaces on the upper levels will dramatically reduce daytime lighting requirements. The College of Hawaiian Language will explore strategies including the potential incorporation of photovoltaic panels, implementation of a desiccant wheel based dehumidification system, and the purchase of green power certificates.

The focus of the *Materials and Resources* category is the reduction in the amount of new materials used for construction by such strategies as building reuse, the use of salvaged materials or materials with recycled content. This category also emphasizes the use of materials having a

lower environmental impact while simultaneously reducing and managing waste more effectively. Strategies for this project under consideration include on-site recycling, diversion of construction debris from landfill, incorporation of recycled content regional materials and certified wood products – potentially site-harvested.

The *Indoor Environmental Quality* category addresses the need to establish good indoor air quality by means of reducing, eliminating, and managing the sources of indoor pollutants. Issues such as thermal comfort and system controllability, as well as allowing occupants to have connectivity to the outdoor environment, are also covered. Strategies being explored for this project emphasize construction practices that eliminate the potential for building contaminants, selection of low-emitting materials, optimization of occupant comfort and control, and creating an intimate connection to the natural environment.

In addition to the strategies already identified, the College of Hawaiian Language will act as a catalyst for green building education. Ideas including the use of environmentally friendly housekeeping products and an integrated pest management plan are also under consideration.

The College of Hawaiian Language complex will also be designed in accordance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG). In addition, the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities and the Architectural Barriers Act Accessibility Guidelines, which have not yet been adopted, will be consulted in anticipation of updated standards. Pedestrian walkways will be sloped at a maximum of 5% to meet ADA guidelines.

Project Description: Landscaping

The landscaping would include use of indigenous plants including ʻōhiʻa and native ferns, presenting the College as a "clearing" in an ʻōhiʻa forest. Some existing trees and brush may be retained along the Nowelo Street side of the project site to complement proposed landscaping. In addition, plants such as hala, hau and kukui trees would be used as plant screens and also for cultural arts and crafts. Plantings of trees around the parking lot and driveway would be limited in height to allow views of Mauna Kea to the west. That view would be further enhanced with the placing of a grass berm along the College's west entry to screen traffic on Nowelo Street. Landscaping to the east would include terraced gardens that will include hapuʻu. Plumeria trees and other plants that are sources for lei-making would be planted at the student entrance on the south side of the building, which would also feature a Hawaiian Botanical Garden. Watering would be minimized through the use of native or adapted plants and ground-covering mulch and through automatic, rain-sensitive irrigation systems.

1.2 Purpose and Need

The proposed College of Hawaiian Language facilities are needed to provide expanded educational opportunities for the public through the revitalization of Hawaiian language and culture. The College was established at UH Hilo in 1997 and includes several entities including the Hawaiian Studies Division, the Hawaiian Language Center Division, the Laboratory School Division and an Outreach Program. The College offered a total of 34 courses and had 710 students as of Fall 2007, with 116 majors in Hawaiian Studies; there were also 46 Kahuwaiola (post-baccalaureate teacher training students) and five Ph.D. candidates. About 15 students receive bachelor's degrees every year, and there have also been four M.A. graduates to date in the young program. However, the College's offerings, which include 14 Hawaiian language courses and 17 Hawaiian studies courses, are currently spread among five existing buildings at UH Hilo and another building located six miles from campus. Such separation of classrooms and faculty offices and support facilities is inefficient and not conducive to the "immersion" concept deemed desirable for mastering the Hawaiian language and culture. The new facility is being designed to effectively accommodate the college's existing entities as well as future growth.

1.3 Summary of Regulatory Requirements

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawai'i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai'i Administrative Rules (HAR), is the basis for the environmental impact process in the State of Hawai'i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the finding (anticipated finding, in the Draft EA) that no significant impacts are expected to occur; Part 5 lists each criterion and presents the findings (preliminary, for the Draft EA) for each made by the University of Hawai'i at Hilo, the proposing agency. If, after considering comments to the Draft EA, the proposing agency concludes that, as anticipated, no significant impacts would be expected to occur, then the agency issues a Finding of No Significant Impact (FONSI), and the action will be permitted to occur. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) is prepared.

1.4 Public Involvement and Agency Coordination

The following agencies and organizations were consulted in development of the environmental assessment:

State:
- Health Department
- Department of Land and Natural Resources, Land Division and Historic Preservation Division
- Office of Hawaiian Affairs
- Transportation Department

County:
- Planning Department
- Public Works Department
- Parks and Recreation Department
- Police Department
- Water Supply Department
- County Council

Private:
- Sierra Club
- Hawai‘i Island Chamber of Commerce
- Kanoelehua Industrial Area Association

Copies of communications received during early consultation are contained in Appendix 1a. Appendix 1b contains written comments on the Draft EA and the responses to these comments. Various places in the EA have been modified to reflect input received in the comment letters; additional or modified non-procedural text is denoted by double underlines, as in this paragraph.

PART 2: ALTERNATIVES

2.1 No Action

Under the No Action Alternative, the development of the College of Hawaiian Language facilities would not be undertaken. Students and the community would not benefit from a consolidation of UH Hilo's Hawaiian language courses and other offerings. Presumably, the land dedicated for expansion of UH Hilo would be utilized for some other university purpose, none of which have been identified or proposed at this time.

2.2 Alternative Locations or Strategies

The property, in close proximity to the current UH Hilo campus, is already under State ownership and is not fully utilized. The EIS for the original development of the entire area including the project site (Hawaii State DAGS 1997) identified the project site for "UH-Hilo Expansion". The project is consistent with that designation. Similarly identified sites are available across Nowelo Street and also south of project site. As there do not appear to be any environmental or other disadvantages associated with the particular proposed site, and the property is well suited to the proposed use and has been dedicated for this type of use, no alternative sites have been advanced in the Environmental Assessment.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The property upon which the College of Hawaiian Language facilities would be developed is referred to throughout this EA as the *project site*. The term *project area* is used to describe the University Park of Science and Technology and in some cases the general environs of the University of Hawai‘i at Hilo.

The project site is located in an area of the University Park slated for expansion of the University of Hawai‘i at Hilo. The vegetation of the project area has been previously disturbed by sugar cane cultivation and grazing activities. The present vegetation is now almost entirely alien. The climate in the area is mild and moist, with an average annual rainfall of about 140 inches (U.H. Hilo-Geography 1998:57). Adjacent land use is primarily university and research activities.

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

Geologically, the site is located on the flanks of Mauna Loa volcano, and the surface consists of lava flows from 5,000 to 10,000 years before the present (Wolfe and Morris 1996). Small areas of younger lava flows are also present. The project site soil is classified by the Natural Resources Conservation Service (formerly Soil Conservation Service) as Panaewa very rocky silty clay loam, 0 to 10 percent slopes. This soil is approximately 16 inches thick, with about 10-25% of the area occupied by lava outcrops. Runoff is slow and erosion hazard slight. Its Capability Subclass is VII, and is mainly used for sugarcane cultivation. Construction on such soils often requires geotechnical testing and proper surface preparation for foundations and footings. Small areas of Keaukaha extremely rocky muck on 6-20% slopes are also present. This organic and strongly acid soil is approximately 0 to 8 inches thick, with about 25% of the area occupied by lava outcrops. Permeability is rapid, runoff is slow, and erosion hazard slight. Its capability subclass is VIIs, which means that this soil has very severe limitations that make it very unsuited for cultivation, and restrict its use to mainly pasture and woodland or wildlife (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the United States Geological Survey in this area of Hilo is zone 3, on a scale of ascending risk from 9 to 1 (Heliker 1990:23). The high hazard risk is based on the fact that Mauna Loa is presently an active volcano. Volcanic hazard zone 3 areas have had 1-5% of their land area covered by lava or ash flows since the year 1800, but are at lower risk than zone 2 areas because of their greater distances from recently active vents and/or because the local topography makes it less likely that flows will cover these areas.

In terms of seismic risk, the entire Island of Hawai‘i is rated Zone 4 Seismic Hazard (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built, as the 6.7-magnitude (Richter) quake of October 15, 2006, demonstrated. The project site does not appear to be subject to subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

In general, geologic conditions impose no constraints on the proposed action, and the proposed project is not imprudent to construct. All design will take into account the soil setting and slopes, and the facility will be designed in accordance with regulations related to its the seismic setting.

3.1.2 Drainage, Water Features and Water Quality

Existing Environment

The project area has no perennial surface water bodies, although the intermittent Waiākea Stream traverses the southern and eastern boundaries of University Park. No known areas of local (non-stream related) flooding are present. According to the Flood Insurance Rate Maps (FIRM), the University Park appears to be located entirely within Zone X, which is comprised of areas determined to be outside the 500-year flood plain. Nearby Waiākea Stream constitutes a special hazard area inundated by the 100-year flood with base flood elevations determined (Zone AE).

Impacts and Mitigation Measure

Because of the limited scale of construction and the lack of sensitive waters nearby, the risks for flooding or impacts to water quality are negligible. Waiākea Stream will be avoided. Much of the project site’s surface would remain permeable, vegetated surface. Rooftop runoff will be used for rainwater harvesting for sewage conveyance and irrigation, greatly reducing storm water. The project will be required to contain any increase in runoff due to the construction of impermeable surfaces onsite, in conformance with Chapter 27 of the Hawai‘i County Code, by directing runoff toward collection points including catch basins.

In order to minimize the potential for sedimentation and erosion, the contractor shall perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code. Because the project will disturb more than one acre of soil, the contractor must obtain a National Pollutant Discharge Elimination System (NPDES) permit before the project commences. This permit requires the completion of a Storm Water Pollution Prevention Plan (SWPPP). In order to properly manage storm water runoff, the SWPPP will describe the emplacement of a number of best management practices (BMPs) for the project. These BMPs may include, but will not be limited to, the following:

- Minimization of soil loss and erosion by revegetation and stabilization of slopes and disturbed areas of soil, possibly using hydromulch, geotextiles, or binding substances, as soon as possible after working;
- Minimization of sediment loss by emplacement of structural controls possibly including silt fences, gravel bags, sediment ponds, check dams, and other barriers in order to retard and prevent the loss of sediment from the site;
- Minimizing disturbance of soil during periods of heavy rain;
- Phasing of the project to disturb the minimum area of soil at a particular time;
- Application of protective covers to soil and material stockpiles;
- Construction and use of a stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond;
- Washing of vehicles in the designated wash area before they egress the project site;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel; and
- Proper clean-up and disposal at an approved site of material from any significant leaks or spills.

3.1.3 Flora, Fauna and Ecosystems

Existing Environment

Based on elevation, rainfall and geologic substrate, the area probably supported a Lowland Wet Forest (Gagne and Cuddihy 1990) dominated by ʻōhiʻa (*Metrosideros polymorpha*) before human alteration. Agricultural activities, including sugar cane cultivation and grazing in the late 19th and early 20th centuries, long ago destroyed the original vegetation. The present vegetation is now almost entirely alien and may be classified as a Lowland Alien Wet Forest (Gagne and Cuddihy 1990).

The project area is characterized mainly by two types of vegetation: ʻōhiʻa -uluhe forest and an introduced mixed forest. In a 1996 survey that covered the entire University Park, 122 species were inventoried. Of those, 100 (82 percent) were identified as introduced or alien species, 6 (5 percent) as originally of Polynesian introduction, and 16 (13 percent) were native. The majority of the introduced species are weedy plants that prefer open, disturbed sites.

In recognition of the long period that had elapsed since the last botanical survey, the site was visited again by biologists Layne Yoshida and Ron Terry in 2007. A full species list is provided in Table 1. The vegetation is a secondary forest dominated by alien species. Dominant canopy tree species are devil tree (*Alstonia marcophylla*), guava (*Psidium guajava*), waiawi (*Psidium cattleianum*), gunpowder tree (*Trema orientalis*), melastoma (*Melastoma candidum*), Chinese banyan (*Ficus microcarpa*), and African tulip (*Spathodea campanulata*). Only a few individuals

of native trees – ʻōhiʻa and hala (*Pandanus tectorius*) – are present. The understory consists of native and alien ferns and a number of alien herbs including Koster's curse (*Clidemia hirta*), basket grass (*Oplismenus hirtellus*), *Wedelia trilobata*, and honohono (*Commelina diffusa*). The vegetation is thick with vines of many species, including the native morning glory (*Ipomoea indica*) and the aliens kukae maile (*Paederia scandens*) and moonflower (*Ipomoea alba*).

Because of the alien vegetation and urban context, there is little habitat for native animal species. All birds observed on the site were alien. Hawaiian Hawks (*Buteo solitarius*) and Hawaiian hoary bats (*Lasiurus cinereus semotus*) are often seen in the general area. Both are listed endangered species, but they are commonly observed in many parts of East Hawaiʻi. The native trees favored by Hawaiian Hawks for nesting are not present in the alien vegetation on the project site and immediately surrounding areas. The urban setting of the project site lessens its value for bat habitat.

As was concluded during the original botanical survey, no rare, threatened or plant or animal endangered species listed by the U.S. Fish and Wildlife Service are present on the parcel, nor are there unique or valuable wildlife habitats.

Impacts and Mitigation Measures

Because of the lack of native ecosystems, or threatened or endangered plant species, no adverse impacts to botanical resources would occur as a result of building or occupying the college. Very few native plant species occur and no native vegetation or habitats are present. As the area does not represent valuable habitat, no adverse impact to Hawaiian Hawks or Hawaiian hoary bats, or any other native animal, is expected.

Construction and operation of the facility would not cause any secondary impacts to biological resources. As no non-negligible adverse effects are likely to occur, there would be no cumulative impacts.

As discussed in Section 1.1, above, landscaping will include use of indigenous plants including ʻōhiʻa and native ferns, presenting the College as a "clearing" in an ʻōhiʻa forest, which will provide an ecological benefit. No substantial biological impact would result from the proposed project.

Table 1
Plant Species on Project Site, 2007

Scientific Name	Family	Common Name	Life Form	Status*
Acacia confusa	Fabaceae	Formosan Koa	Shrub	A
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A
Alstonia marcophylla	Apcynaceae	Devil Tree	Tree	A
Archontophoenix alexandrae	Araceae	King Palm	Tree	A
Ardisia elliptica	Myrsinaceae	Shoebutton Ardisia	Tree	A
Arundina graminifolia	Orchidaceae	Bamboo Orchid	Herb	A
Bambusa sp	Poaceae	Bamboo	Tree	A
Begonia sp.	Begoniaceae	Begonia	Herb	A
Blechnum appendiculatum	Blechnaceae	Blechnum	Fern	A
Brachiaria mutica	Poaceae	California Grass	Herb	A
Buddleia asiatica	Buddleiaceae	Dog Tail	Shrub	A
Canavalia galeata	Fabaceae	Maunaloa	Vine	A
Castilleja arvensis	Scrophulariaceae	Indian Paintbrush	Herb	A
Cestrum nocturnum	Solanaceae	Night Jasmine	Shrub	A
Chamaecrista nictitans	Fabaceae	Partridge Pea	Herb	A
Chamaesyce hirta	Euphorbiaceae	Garden Spurge	Herb	A
Chamaesyce hypericifolia	Euphorbiaceae	Graceful Spurge	Herb	A
Chamaesyce prostrata	Euphorbiaceae	Prostrate Spurge	Herb	A
Christella dentata	Thelypteridaceae	Cyclosorus	Fern	A
Citharexylum caudatum	Verbenaceae	Fiddlewood	Tree	A
Clidemia hirta	Melastomataceae	Koster's Curse	Shrub	A
Clusia rosea	Clusiaceae	Autograph Tree	Tree	A
Cordyline fruticosa	Agavaceae	Ki	Shrub	A
Crotalaria sp.	Fabaceae	Crotalaria	Shrub	A
Cuphea carthagenensis	Lythraceae	Tarweed	Herb	A
Cyperus halpan	Cyperaceae	Cyperus	Herb	A
Desmodium sandwicense	Fabaceae	Spanish Clover	Herb	A
Dicranopteris linearis	Gleicheniaceae	Uluhe	Fern	I
Dioscorea sp.	Dioscoreaceae	Dioscorea	Vine	A
Emilia sp.	Asteraceae	Emilia	Herb	A
Eragrostis sp.	Poaceae	Eragrostis	Herb	A
Ficus microcarpa	Moraceae	Chinese Banyan	Tree	A
Hedychium sp.	Zingiberaceae	White or Yellow Ginger	Herb	A
Hippobroma longiflora	Campanulaceae	Star of Bethlehem	Herb	A
Hyptis pectinata	Lamiaceae	Comb Hyptis	Shrub	A
Ipomoea alba	Convolvulaceae	Morning Glory	Vine	A
Ipomoea indica	Convolvulaceae	Morning Glory	Vine	I
Kyllinga brevifolia	Cyperaceae	Kyllinga	Herb	A
Lepisorus thunbergianus	Polypodiaceae	Pleopeltis	Fern	I
Lycopodiella cernua	Lycopodiaceae	Hulu iole	Fern Ally	I
Lygodium japonicum	Schizaeaceae	Japanese Climbing Fern	Fern	A

Table 1, continued				
Scientific Name	**Family**	**Common Name**	**Life Form**	**Status***
Macaranga mappa	Euphorbiaceae	Bingabing	Tree	A
Macroptilium lathyroides	Fabaceae	Cow Pea	Herb	A
Mangifera indica	Anacardiaceae	Mango	Tree	A
Melastoma sp.	Melastomataceae	Melastoma	Shrub	A
Melinis minutiflora	Poaceae	Mollasses Grass	Herb	A
Melochia umbellata	Sterculiaceae	Melochia	Tree	A
Metrosideros polymorpha	Myrtaceae	ʻŌhiʻa	Tree	I
Mimosa pudica	Fabaceae	Sleeping Grass	Herb	A
Nephrolepis multiflora	Nephrolepidaceae	Sword Fern	Fern	A
Oenethera lacinianata	Onagraceae	Evening Primrose	Herb	A
Oplimenus sp.	Poaceae	Basket Grass	Herb	A
Paederia scandens	Rubiaceae	Maile Pilau	Vine	A
Pandanus tectorius	Pandanaceae	Hala	Tree	A
Panicum maximum	Poaceae	Guinea Grass	Herb	A
Panicum repens	Poaceae	Torpedo Grass	Herb	A
Paraserianthes falcataria	Fabaceae	Albizia	Tree	A
Paspalum conjugatum	Poaceae	Hilo Grass	Herb	A
Paspalum sp.	Poaceae	Paspalum	Herb	A
Pennisetum purpureum	Poaceae	Napier Grass	Herb	A
Phlebodium aureum	Polypodiaceae	Golden Polypody	Fern	A
Phyllantus debilis	Euphorbiaceae	Niruri	Herb	A
Phymatosorus grossus	Polypodiaceae	Maile Scented Fern	Fern	A
Pilea microphylla	Urticaceae	Artllery Plant	Herb	A
Pityrogramma calomelanos	Pteridaceae	Silver Fern	Fern	A
Pluchea symphytifolia	Asteraceae	Sourbush	Shrub	A
Polygala paniculata	Polygalaceae	Polygala	Herb	A
Polygonum sp.	Polygonaceae	Polygonum	Herb	A
Psidium cattleianum	Myrtaceae	Waiawi	Tree	A
Psidium guajava	Myrtaceae	Guava	Tree	A
Psilotum nudum	Psilotaceae	Moa	Fern Ally	I
Rhynchelytrum repens	Poaceae	Natal Redtop	Herb	A
Rubus rosifolius	Rosaceae	Thimbleberry	Herb	A
Sacciolepis indica	Poaceae	Glenwood Grass	Herb	A
Scaevola sericea	Goodeniaceae	Beach Naupaka	Shrub	I
Schefflera actinophylla	Araliaceae	Octopus Tree	Tree	A
Schinus terebinthifolius	Anacardiaceae	Christmas Berry	Tree	A
Schizachyriun condensatum	Poaceae	Beardgrass	Herb	A
Setaria palmifolia	Poaceae	Palmgrass	Herb	A
Spathodea campanulata	Bignoniaceae	African Tulip	Tree	A
Spermacoce sp.	Rubiaceae	Buttonweed	Herb	A
Sporobolus sp.	Poaceae	Smut Grass	Herb	A
Stachytarpheta jamaicencis	Verbenaceae	Jamaican Vervain	Shrub	A
Syzygium jambos	Myrtaceae	Roseapple	Tree	A
Torenia glabra	Scrophulariaceae	Olaa Beauty	Herb	A
Trema orientalis	Ulmaceae	Gunpowder Tree	Tree	A
Tridax procumbens	Asteraceae	Coat Buttons	Herb	A
Veronica sp.	Scrophulariaceae	Speedwell	Herb	A
Vigna luteola	Fabaceae	Hairypod Cowpea	Herb	A

Wedelia trilobata	Asteraceae	Wedelia	Herb	A
Zingiber zerumbet	Zingiberaceae	Awapuhi	Herb	A

A = alien, E = endemic, I = indigenous, End = Federal and State listed Endangered Species

3.1.4 Air Quality, Noise, and Scenic Resources

Environmental Setting

The minimal air pollution found in East Hawai‘i is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that occasionally blankets the district, particularly during southerly or “kona” wind conditions. The persistent tradewinds keep the project area relatively free of vog for most of the year.

Noise on the project site is low and derived mainly from motor vehicles, with occasional noise from road use and maintenance activities.

The project area does not contain any sites that are considered significant for their scenic character in the Hawai‘i County General Plan.

Impacts and Mitigation Measures

The proposed action would not measurably affect air quality or noise levels except minimally during construction. In order to minimize impacts from dust, the contractor would prepare a dust control plan compliant with provisions of Hawai‘i Administrative Rules, Chapter 11-60.1, “Air Pollution Control,” Section 11-60.1-33, “Fugitive Dust”.

Development would entail limited excavation, grading, compressors, vehicle and equipment engine operation, and construction of new infrastructure. These activities may generate noise exceeding 95 decibels at times, impacting nearby sensitive noise receptors (e.g., observatory offices and student dormitories). In cases where construction noise is expected to exceed the Department of Health’s (DOH) “maximum permissible” property-line noise levels, contractors would obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH would review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers. As the site is remote from non-University uses, there may be no need for special mitigation.

No important viewplanes or scenic sites recognized in the Hawai‘i County General Plan would be affected; scenic effects will generally be beneficial, as the building will provide an attractive addition to the UH Hilo campus. The building will be as high as 60 feet in places, but as the ground elevation is 195 feet, and the elevation of the nearest major viewplane on Komohana Street at 320 feet, no interference with views will occur.

3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions

Environmental Setting, Impacts and Mitigation Measures

A Phase I Environmental Site Assessment (ESA) was performed for the project site by Myounghee Noh & Associates (MNA) in July 2006. The report is contained in Appendix 6 and summarized below.

A Phase I Environmental Site Assessment aims to identify *recognized environmental conditions* that exist on the project site, and existing *recognized environmental conditions* in the project area that have the potential to impact the subject property. The term *recognized environmental conditions* means the presence or likely presence of any hazardous substances or petroleum products on the property under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property (American Society for Testing and Materials [ASTM], 2000. The Phase I Environmental Site Assessment performed for the project conforms to the ASTM standard.

In a Phase I Environmental Site Assessment, evidence of *recognized environmental conditions* may be obtained by execution of the following:

- A records search of federal and State databases of hazardous material use, storage, and releases, including, but not limited to, hazardous material generators, leaking underground storage tanks, and reported hazardous material releases;
- Interviews with landowners, nearby residents, and regulatory agency members concerning the subject property's history of land use;
- Other records searches, including tax records, aerial photography, and, when available, fire insurance maps; and
- A visual survey of the property and immediately surrounding areas.

Phase I ESA Findings

Database Search for Subject and Adjacent Properties

The project site and adjacent properties were not listed in the federal and State databases covered by Environmental Data Resources. No other sources of offsite potential contamination were found to exist in the project area. The findings of this records search are summarized in Table 2, below.

Table 2
Findings of Records Search, Phase I ESA

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	6
Federal CERCLIS List	½ mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	½ mile	None
State-Equivalent CERCLIS	½ mile	None
State Landfill and/or Solid Waste Disposal Site List	½ mile	None
State Registered UST List	¼ mile	None
State Leaking UST List (LUST)	½ mile	2
Federal RCRA Generators List	½ mile	1
FEDERAL ERNS List	Subject Site	None
State Spill List	Subject Site	1

See Appendix 5 for explanation of databases

It is MNA's opinion that the above sites do not pose a significant threat to the subject site. This opinion is based on distance (the listed sites are too far away to pose potential migration threats) and the State of Hawai'i Department of Health records on LUST. MNA's findings are as follows:

- *Hazardous Materials and Regulated Wastes*: MNA observed no evidence of hazardous materials or regulated wastes on the subject and adjoining sites. UH-Hilo is listed as a RCRA Small Quantity Generator.
- *Storage Tanks*: MNA observed no Underground Storage Tanks (USTs) in use at the subject property at the time of this ESA. No ASTs were visible at the project site. UH-Hilo was listed on the Leaking Underground Storage Tank (LUST) site list for two separate incidents, neither close to the project site. Cleanup was completed for both incidents, in 1999 and 2000, respectively.
- *Spills.* On April 22, 2003, petroleum contaminated soil was discovered during an excavation near the auto shop on campus, approximately 500 feet from the subject site. The amount and source of contamination was unknown.
- *Potential Asbestos-, Polychlorinated Biphenyl (PCB)- or Lead-Containing Material***:** MNA found no evidence of materials that could contain asbestos, lead, and PCBs.
- *Offsite Contamination Source*: None were detected.

In summary, MNA observed no *recognized environmental conditions* in connection with the project site and no records indicate environmental problems.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

Table 3 provides information on the socioeconomic characteristics of Hilo along with those of Hawai‘i County as a whole for comparison, from the United States 2000 Census of Population. Hilo and Hawai‘i County in general have a diverse population that is among the 100 fastest-growing counties in the U.S. The proportion of the Hawaiian population in Hilo is more than one-third greater than that of the County as a whole. Several segments of the population that typically exhibit disadvantaged measures of social welfare are disproportionately represented in the population of Hilo as compared to the County or State of Hawai‘i. Median family income is less than 65 percent that of the County as a whole. Over 15 percent of individuals have income below the poverty level, double the statewide rate. Similar patterns obtain for households receiving welfare, food stamps, and disability payments.

The University of Hawai‘i at Hilo student population is a rich blend of local, mainland and international students, making it among the nation’s most diverse universities. Students of Native Hawaiian ancestry make up about 20 percent of the UH Hilo enrollment. The university, the second-largest employer in East Hawai‘i, consists of five academic colleges offering 35 baccalaureate degrees, six master degrees and two doctorates, including one approved in 2006 in Hawaiian and Indigenous Language and Culture Revitalization. The university has sustained steady growth in the statewide University of Hawai‘i system, growing 33 percent since 1977 and reaching a high of 3,608 students in Fall 2007. It is also the only campus in the statewide UH system to show consistent increases in spring enrollment.

Table 3
Selected Socioeconomic Characteristics

CHARACTERISTIC	ISLAND OF HAWAI`I	Hilo
Total Population	148,677	40,759
Percent Caucasian	31.5	17.1
Percent Asian	26.7	38.3
Percent Hawaiian	9.7	13.1
Percent Two or More Races	28.4	29.7
Median Age (Years)	38.6	38.6
Percent Under 18 Years	26.1	24.7
Percent Over 65 Years	13.5	16.7
Percent Households with Children	21.3	36.1
Average Household Size	2.75	2.7
Median Family Income	$39,805	$35,506
Percentage of Population Below 100% of Federal Poverty Level	15.7	11.7
Percent Housing Vacant	15.5	9.0

Source: U.S. Bureau of the Census. May 2001. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai'i.* (U.S. Census Bureau Web Page).

The University of Hawai‘i at Hilo is the state's leading institution in Hawaiian language and traditional culture study and is the only university in the nation that offers a master and doctorate degree program in an indigenous language. Credited by the Western Association of Schools and Colleges for its "bold vision of service to the Hawaiian community," the College of Hawaiian Language is leading the pioneering effort to develop teachers and instructional materials for the Hawaiian medium education in the State of Hawai‘i. That education includes immersion programs conducted by the State of Hawai‘i Department of Education in which students study and converse exclusively in the Hawaiian language. Students at the College are encouraged to become involved in the local community through a requirement that they take at least one course from a community expert and complete an exiting seminar class focusing on community involvement.

Impacts

The proposed project would benefit public welfare in the Hilo area as well as the entire State of Hawai‘i through enhancement of access to educational opportunities and the perpetuation and advancement of Hawaiian culture, a treasured resource.

3.2.2 Cultural Setting

Existing Environment

The earliest historical knowledge of Hilo comes from legends written by Samuel Kamakau (1961) of a 16th century chief ʻUmi-a-Liloa (son of Liloa), who at that time ruled the entire island of Hawaiʻi. Descendants of Umi and his sister-wife were referred to as "Kona" chiefs, controlling Kaʻū, Kona, and Kohala, while descendants of Umi and his Maui wife were "Hilo" chiefs, controlling Hāmākua, Hilo, and Puna (Kelly 1981:1). According to Kamakau (1961), both sides fought over control of the island, desiring access to resources such as feathers, *māmaki* tapa, and canoes on the Hilo side, and *wauke* tapa and warm lands and waters on the Kona side (Kelly 1981:3).

Sometime near the end of the 16th century or early in the 17th century, the lands of Hilo were divided into *ahupuaʻa,* which till today retain their original names (Kelly 1981:3). These include the *ahupuaʻa* of Puʻuʻeo, Piʻihonua, Punahoa, Pōnohawai, Kūkūau and Waiākea. The design of these land divisions was such that residents could have access to all that they needed to live, with ocean resources at the coast, and agricultural and forest resources in the interior. However, only Piʻihonua and Waiākea provided access to the full range of resources stretching from the sea up to 6,000 feet along the slopes of Mauna Kea (Kelly 1981:5).

Historical accounts (McEldowney 1979) place the current study area in a zone of agricultural productivity. As Isabella Bird recorded upon arriving in Hilo in 1873:

> "Above Hilo, broad lands sweeping up cloudwards, with their sugar cane, *kalo*, melons, pine-apples, and banana groves suggest the boundless liberality of Nature" (Bird 1964:38).

Handy and Handy (1972) also describe the general region as an agricultural area:

> "On the lava strewn plain of Waiakea and on the slopes between Waiakea and Wailuku River, dry taro was formerly planted wherever there was enough soil. There were forest plantations in Panaewa and in all the lower fern-forest zone above Hilo town along the course of the Wailuku River" (Handy and Handy 1972:539).

Maly (1996) refers to a 1922 article from the Hawaiian Language newspaper, *Ka Nupepa Kūʻokuʻa*, where planting on *pāhoehoe* lava flats is described:

> "There are *pahoehoe* lava beds walled in by the ancestors in which sweet potatoes and sugar cane were planted and they are still growing today. Not only one or two but several times forty (*mau kaʻau*) of them. The house sites are still there, not one or two but several times four hundred in the woods of the Panaewa. Our

indigenous bananas are growing wild, these were planted by the hands of our ancestors" (Maly 1996:A-2).

Waiākea Ahupua'a

The project site is in the ahupua'a of Waiākea, a very large land division that includes all land in and near UH-Hilo as well as the land mauka and makai. As part of an archaeological assessment study, Maly (1996) conducted historical research for the lands of Wainaku, Pōnohawai, Waiākea, and Pi'ihonua. He discusses the significance of the use of the Hawaiian word *wai* in the place names: Waiākea, Pōnohawai, Wainaku, and Wailuku (River). According to Maly, the word *wai* (water) has strong metaphorical associations with the Hawaiian concept of wealth (*waiwai*), stressing its cultural importance (Maly 1996:A-2). In this context, the importance of Hilo can be better understood, with its copious streams that fed taro pondfields and its numerous fishponds.

Waiākea along with Punahoa and Pi'ihonua were held by Kamehameha I until the time of his death in 1819, at which time his holdings, including Waiākea, were passed down to his son, Liholiho. Following the *Māhele,* the population of Hilo grew and the scattered upland habitations gave way to sugar cultivation (McEldowney 1979:37).

By 1905, according to Thrum (1923) the Hawaii Mill Company had 10 miles of cane flumes and produced twenty-five tons of sugar per day. In 1920 Hawaii Mill Company was taken over by the Hilo Sugar Company (Kelly 1981). Commercial sugar production lasted in Waiākea until the mid twentieth century, at which time many of the fields were converted to pasturage associated with cattle ranching.

Following the *Māhele*, Kamehameha IV leased large portions of Waiākea to outside interests for pasture and sugarcane cultivation (Moniz n.d.). In 1861 S. Kipi leased the Crown Lands of Waiākea for the rate of $600 dollars a year to be used as pasture land for five years (Kelly et al. 1981; Maly 1996). In 1874 the first lease for sugarcane cultivation in Waiākea was granted to Rufus A. Lyman for a term of 25 years. The lease granted him all the privileges of the land including the use of the fishponds and the cutting of firewood (Maly 1996). This lease was eventually transferred to the Waiākea Mill Company, founded by Alexander Young and Theo H. Davis, and the Waiākea sugar plantation was established.

Established in 1879, the Waiākea Mill Company started with about 350 acres of cultivated lands they had acquired from Lyman. In 1888 the company acquired a 30-year lease that increased their land holdings in Waiākea Ahupua'a. When the lease ran out in 1918 the acreage under cultivation had increased to nearly 7,000; but without a lease the *ahupua'a* fell under the homesteading laws, which required the government to lease the land to individual growers. Waiākea Mill Company was expected to grind the crop for the independent growers under a contract that gave the company 40% of the proceeds from the sale of the refined sugar. Contractual and legal problems combined with a declining sugar market and the devastating *tsunami* of 1946 led the Waiākea Mill Company to cease operation in 1947. During the 68 years

of its operation, the Waiākea Mill Company was a major force in shaping the economic and social growth of Hilo, and certainly left its mark on both the cultural and physical landscape of the area. The productive areas were interconnected with a plantation railroad system connecting fields with the mill at Wailoa Stream. A 1918 map of Waiākea Mill Company's holdings indicate that the project site was under cultivation (Rechtman Consulting 2006:10).

No caves, springs, pu'u, native forest groves, gathering resources or other natural features are present on or near the project site. The vegetation is highly disturbed and does not contain the quality and quantity or resources that would be important for native gathering. As discussed in the next section, no significant archaeological remains reflecting cultural history or supporting cultural values appear to be present. Based on historical research, botanical reconnaissance and interviews with knowledgeable informants, it would appear that no known valuable natural, cultural or historical resources are present on the project site. The project site does not support any traditional resource uses, nor are there any Hawaiian customary and traditional rights or practices known to be associated with the property.

Impacts and Mitigation Measures

As part of the current study, an effort was made to obtain information about any potential traditional cultural properties and associated practices that might be present, or have taken place in upper Waiākea Ahupua'a. The Office of Hawaiian Affairs (East Hawai'i) and the Hilo Hawaiian Civic Club have been contacted during early consultation. Although there were no initial indications from these groups – or any other source – that there are any traditional cultural properties in the immediate vicinity of the current project area or current use of the area for traditional and customary practices, they were supplied a copy of the EA in order to help finalize this finding. No additional information was supplied.

As it appears that no resources or practices of a potential traditional cultural nature (i.e., landform, vegetation, etc.) are present on or near the project site, and there is no evidence of any traditional gathering uses or other cultural practices, the proposed construction and maintenance would not likely impact any culturally valued resources or cultural practices. Instead, the perpetuation and advancement of Hawaiian culture the project represents will encourage will greatly benefit cultural resources and practices.

3.2.3 Archaeology and Historic Sites

Existing Environment

Archaeological surveys of the area was conducted in the early 1990s by Cultural Surveys Hawai'i as part of the EIS conducted for the University Park of Science and Technology (Hawai'i State DAGS 1997; Borthwick et al 1993). As discussed above, the project area is located in the ahupua'a of Waiākea within what is described as "upland agricultural" areas, which range from 50 to 1,500 feet in elevation. According to "Archaeological and Historical Literature Search and Research Design," a portion of the 1979 "Lava Flow Control

Study" by Holly McEldowney, early visitors to Hilo Bay described this area as "an open parkland gently sloping to the base of the woods" and "an expanse broken by widely spaced cottages or huts, neatly tended gardens and small clusters of trees." Prehistoric use of this land was likely for farming and gathering of resources, including plants for food, fiber, medicine and firewood. Housing in the area is believed to be predominately for temporary use associated with agriculture.

In the early 20th century, the State land was leased by sugar cane plantations and was designated with field numbers in maps of the Waiākea Mill Company. However, the land is rocky and poorly suited for mechanical cane cultivation. By mid-century the plantations were no longer growing sugar cane there and grazing was taking place.

Archaeological fieldwork located four archaeological sites, each composed of numerous features scattered over a wide area in the southern portion of the University Park)Figure 5). Two of those sites appear to extend within the project site. One, designated by the State as No. 50-10-35-18670, is an expansive agricultural field, which at one time was Cane Lot #16 of the Waiākea Mill Company. As a remnant of a commercial sugar cane field, the site contains dispersed field-rock clearing mounds and is bounded by low rock walls and fences that follow the natural boundaries of stream banks and unweathered lava flow. The other site, 50-10-35-18669, may have been used as a lunch station and has an interior defined by low walls and contained 20th century whiskey and soda bottles on the surface. Usage of both sites is believed to have occurred in the 1900s and perhaps as recently as the 1940s for agriculturally productive areas.

These sugar cane agriculture sites were judged by the archaeologists to be significant for information content only, as better examples of such sites were already preserved nearby, and the information gathered as part of the inventory was considered sufficient. The State Historic Preservation Division concurred with this conclusion in a letter of August 9, 1994 (Appendix 3).

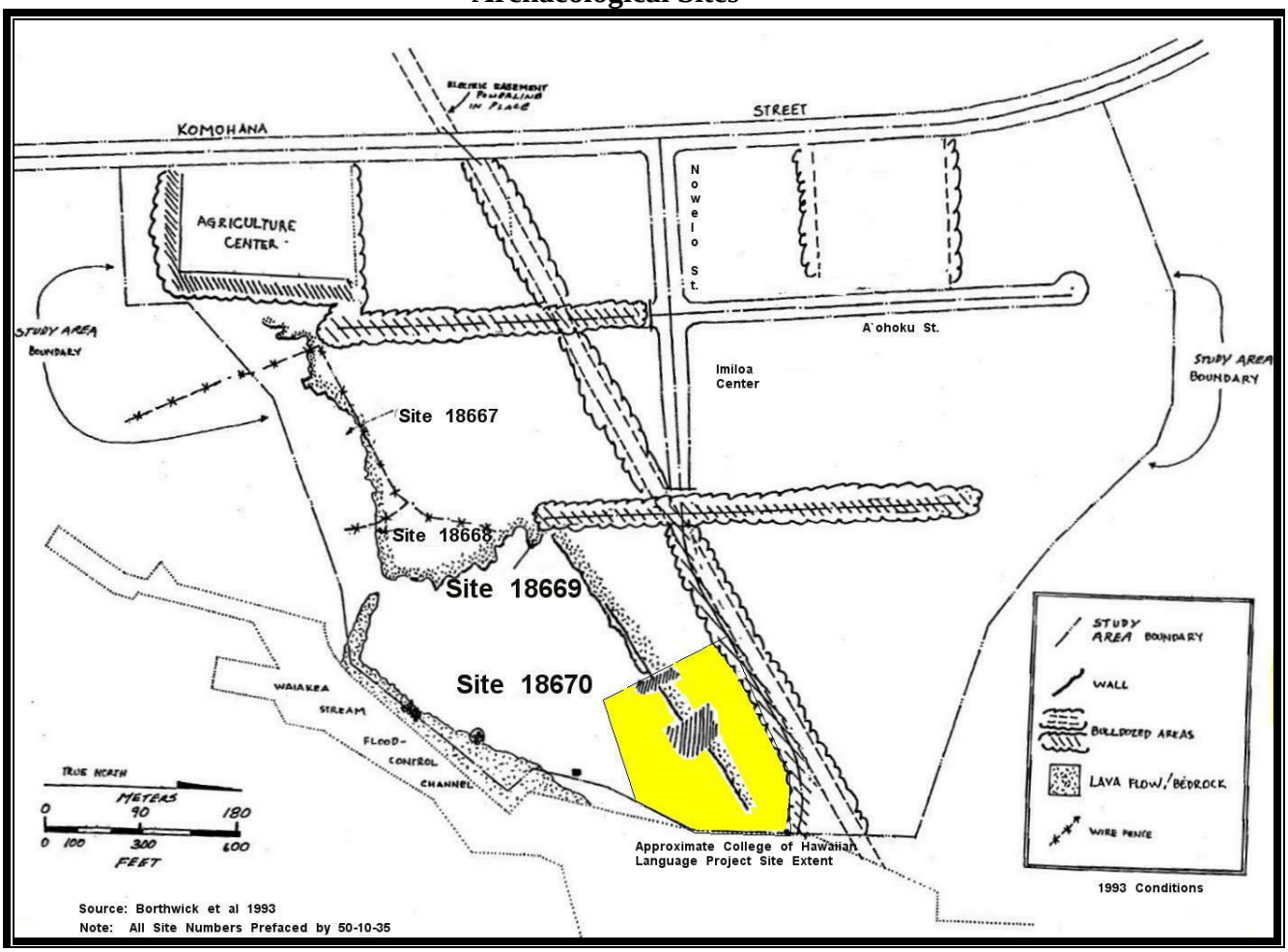
Since that time, the area has been further disturbed by grading of roads, utility corridors and geotechnical testing grids.

Impacts and Mitigation Measures

As the State Historic Preservation Division has concurred that archaeological inventory survey has successfully recovered information concerning the sugar cane archaeological sites, it is concluded that no significant historic properties will be affected by the proposed action.

In the unlikely event that human skeletal remains or undocumented archaeological resources are encountered during future development activities within the current study area, work in the immediate area of the discovery shall be halted and the State Historic Preservation Division contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

Figure 5
Archaeological Sites



3.3 Infrastructure

3.3.1 Utilities

Existing Facilities and Services, Impacts and Mitigation Measures

Available utilities include a 12-inch diameter water line and 8-inch diameter sewer line constructed in the late 1990s under Nowelo Street to serve university expansion in the University Park. A new water reservoir on the mauka side of Komohana Street serves the University Park area. The proposed water system would be designed to accommodate required fire hydrant flow.

Electrical service would be provided from a Hawai‘i Electric Light Company (HELCO) circuit on Nowelo Street. Communication circuits, consisting of fiber optic and copper backbone connections, would be provided by Hawaiian Telcom from an existing switchgear building located across the Nowelo Street bridge. Exterior lighting would consist of low-pressure sodium floodlights with horizontal shielding to adhere to Hawai‘i County’s lighting ordinance.

The proposed action would require connection to County water and sewer services and HELCO electrical service but would not have any substantial impact on existing facilities. Appropriate coordination with the County, HELCO and Hawaiian Telcom will be conducted during the design and construction of the improvements.

Waste of energy and water will be minimized through the certified green design (see Section 1.1), which will include various water efficiency measures such as rainwater harvesting for sewage conveyance and irrigation, appropriate landscaping, and installation of high efficiency plumbing fixtures. Electric power will be conserved by establishing and meeting energy efficiency goals and systems with optimized performance, including use of renewable or alternative energy sources such as photovoltaic panels and implementation of a desiccant wheel based dehumidification system.

3.3.2 Roadways and Traffic

Introduction

A Traffic Impact Analysis Report (TIAR) for the project was prepared by SSFM International, Inc.; it is attached as Appendix 2 and summarized below.

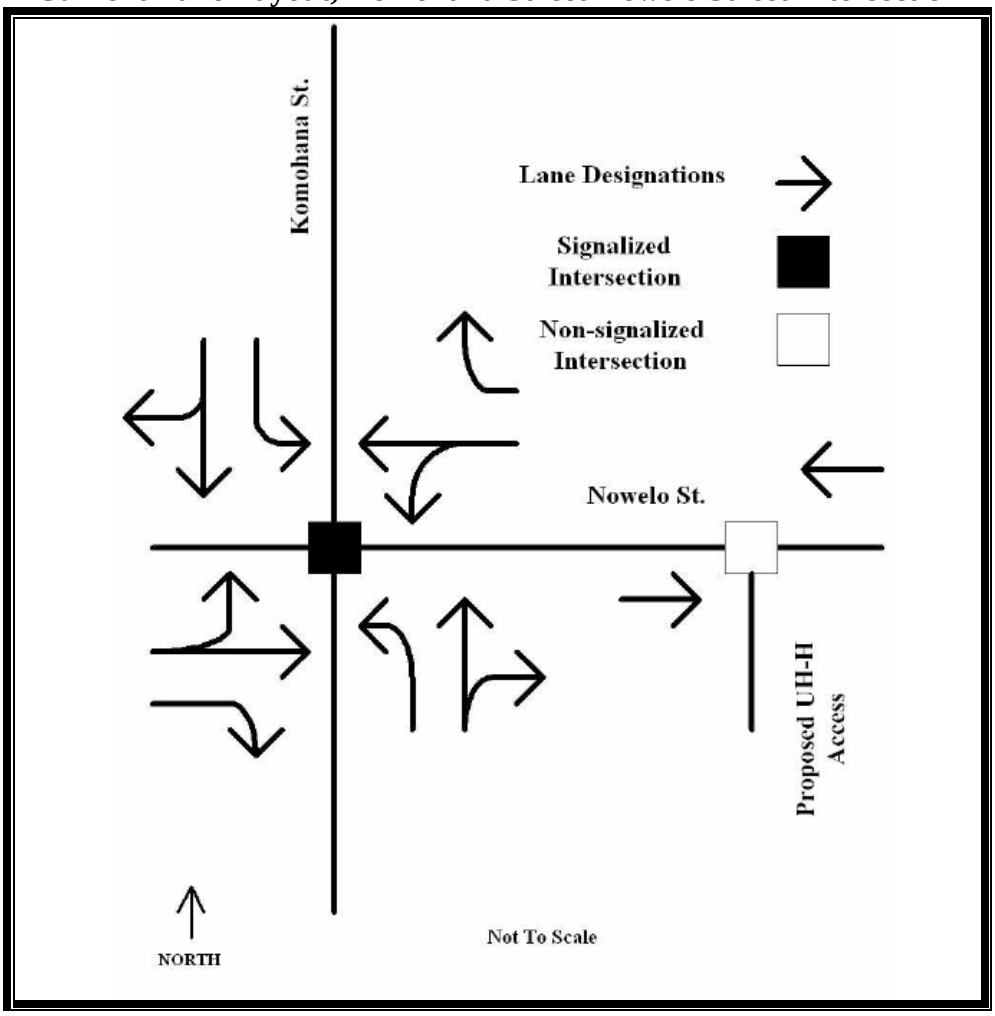
Existing Facilities and Conditions

Street access to the project is on Nowelo Street, about 1,475 feet to the east of its intersection with Komohana Street, in the growing mauka section of campus. Currently, because of traffic calming barriers, parking lot locations and traffic restrictions on the Nowelo Street route into campus, the great majority of traffic entering the university uses Kawili and Lanikaula Streets instead. Nowelo Street has two travel lanes and a raised dividing median in each direction at its

intersection with Komohana Street (Figure 6). However, the street reduces down to one lane in each direction at its intersection with North A‘ohōkū Street, which is located about 475 feet from the intersection at Komohana Street. Nowelo Street has a posted speed limit of 20 mph and was designed with curbs, gutters and sidewalks. Nowelo Street at the project site is basically flat and straight. The estimated annual average daily traffic for Nowelo Street at the site is approximately 1,820.

Komohana Street is a major arterial street serving Hilo, connecting from West Puainako Street to Mohouli Street. Komohana Street is basically a three-lane street at its intersection with Nowelo

Figure 6
Current Lane Layout, Komohana Street-Nowelo Street Intersection



Street and has a left turn lane and a combination through/right turn lane in each direction. The street has a paved shoulder of about six feet and no sidewalks. The annual average daily traffic (AADT) of Komohana Street in the vicinity of the intersection with Nowelo Street is about

17,800 cars as documented by previously completed traffic analysis reports[1] for projects within one-half mile of the UHH HLB project site. Figure 6 illustrates the current lane layout at the Komohana Street-Nowelo Street intersection.

The intersection of Komohana Street at Nowelo Street is controlled by a traffic signal that operates as an independent signal for the weekend and the entire weekday except for the time period from 7:10 to 8:00 AM. During that time period, the signal joins the coordinated system along Komohana Street with a cycle length that is double the system cycle of 127 seconds; i.e., it operates on a 254-second cycle during the 7:10 to 8:00 AM period. Hawai‘i County Public Works staff indicates this arrangement has greatly improved traffic flow at the morning peak hour. The signal has a single phase for the Nowelo Street approaches and left turn phases in each direction for the Komohana Street approaches.

Methods

The TIAR study was conducted in conformance to the Institute of Transportation Engineers (ITE) publication *Access and Impact Studies for Site Development*. The approach consisted of assessing existing conditions, predicting background traffic growth, and assessing traffic conditions in the year of full buildout of the project for both the No-Build and Build conditions. It was determined that the project will be fully built and occupied by the year 2010 (an accelerated buildout of all phases was assumed in order to be conservative). Therefore, this study made assessments of traffic conditions in the year 2007 and in the year 2010, with and without the development in place.

Predicted traffic volumes resulting from the generation of traffic created by site development were added to existing-plus-background growth to derive future traffic volumes with the site fully developed. The *Highway Capacity Manual* (Transportation Research Board 2000) (HCM) was used to assess traffic conditions and Level of Service (LOS) for the intersections in the study area. *Synchro* software was used to apply the HCM methods.

The primary measure of traffic flow quality for the study used the concept of Level of Service (LOS) as defined by the HCM. Generally, the concept of LOS for intersections relates the quality of traffic flow to the delay time experienced by drivers. LOS varies from “A” to “F”, with the quality of traffic service declining as the levels move from “A” towards “F”. With declining LOS, the ability to travel at the desired speed is inhibited by other vehicles either adjacent, opposite, or in front of a driver. Generally, in urban areas and growing rural areas transitioning to urban areas, it is expected that LOS D will be prevalent and acceptable in the morning and afternoon peak hours. So, any traffic movements with LOS E or worse would need to be

[1] Referenced traffic impact studies include:
- UH-Hilo Student Life Center (Draft), July 2005
- US – China Center at UH-Hilo, Rowell, September 2001
- Mauna Kea Astronomy Education Center, M&E Pacific, July 2002

reviewed closely to determine if any changes or improvements could be made to move the LOS to an acceptable level. Table 4 indicates general LOS and the thresholds of delay for signalized and non-signalized intersections.

Table 4. Levels of Service for Intersections*

Level of Service	Signalized Intersections	Non-signalized Intersections
	Vehicular Delay (Seconds)	Vehicular Delay (Seconds)
A	< 10	<10
B	10 – 20	10 - 15
C	20 – 35	15 - 25
D	35 – 55	25 - 35
E	55 – 80	35 - 50
F	> 80	> 50

*From Highway Capacity Manual, 2000 Edition, Transportation Research Board.

In order to assess current traffic conditions, a traffic turning movement count was made at the intersection of Komohana Street at Nowelo Street on August 7, 2007. Traffic volumes on Nowelo Street at the project site were then estimated by adding various lane totals. Morning and afternoon peak hours were 7:00 to 8:00 AM and 4:00 to 5:00 PM. Truck counts were not made at the Komohana Street at Nowelo Street intersection, but an estimate of 2 percent was assumed for all movements at both the intersections. Pedestrian counts were not made due to the very low level of pedestrian activity at the study intersections and the expectation that the proposed development would not create significant volumes of pedestrian traffic. Table 5 shows the LOS for the individual movements that make up the intersection Komohana Street and Nowelo Street and the total intersection LOS.

Table 5. Level of Service at Komohana Street and Nowelo Street Intersection, 2007

Intersection	Movement	AM Peak Hour LOS	PM Peak Hour LOS
Komohana St. at Nowelo St.	Northbound Left turn*	A	B
	Northbound Thru/Right*	B	A
	Southbound Left turn *	D	A
	Southbound Thru/Right *	A	B
	Eastbound Left/Thru**	F	C
	Eastbound Right **	F	C
	Westbound Left/Thru**	F	C
	Westbound Right**	F	C
	Total	**B**	**B**

* motor vehicle starts on Komohana Street ** motor vehicle starts on Nowelo Street

No daily traffic volumes are available from HDOT or DPW for any nearby count stations. A review of traffic growth factors contained in several other traffic impact studies for projects located within one-half mile of UH Hilo determined that the background traffic growth rate is about two percent per year on Komohana Street. The two percent annual growth factor was applied to the existing morning and afternoon peak hour volumes to yield future traffic volumes in the buildout year of 2010.

To provide similar predictions for the Build Alternative, the traffic engineer was required to determine how many trips peak-hour trips would be generated by the facility. In a standard analysis, projects are usually classified in a category for which empirical research findings have been compiled by the Institute of Transportation Engineers and published in the *Trip Generation Handbook* (ITE 1995). In this case, facility's combination of college students and school-age children is unique and not considered per se in the handbook. A hybrid method focusing on the number of parking spaces in this campus setting was used to predict entry and exit trips at the AM and PM peak hours (see Appendix 2 for details). The project would generate about 86 trips in the AM peak hour and about 32 trips in the PM peak hour. These volumes are minor compared to the existing volumes on Komohana Street, which total over 1,800 in the AM peak hour and over 1,600 in the PM peak hour.

The new trips were then distributed among the various movements in the Komohana Street-Nowelo Street intersection by a software program that takes into account existing volumes and project-specific information. To be conservative, it was assumed that the trip distribution peaks matched the current distribution of traffic in the study network for the AM and PM peak hours. From these movements, LOS was calculated.

Table 6 provides LOS for both the Build and No-Build Alternatives for the buildout year 2010 for the site Komohana Street-Nowelo Street intersection.

Whether or not the project is built, the continued growth in traffic will have the effect of increasing congestion and delay and reducing levels of service in the study network for various movements of the intersection and for the intersection as a whole. For example, under the No-Build Alternative, the overall AM peak LOS would decrease from B to C, while the PM peak would remain at B. The Build Alternative would see LOS decrease to E in the AM but remain at B in the PM.

When individual movements are analyzed (Table 5), it is clear that it is principally those movements that start from the minor street, i.e., Nowelo Street, that would have poorer LOS. However, volumes here are also low, and far fewer motorists would be inconvenienced in comparison to motorists on Komohana Street, where LOS generally remains good, with the

Table 6
LOS for Year 2010, AM and PM Peak Hours

2010 Conditions		No Build		Build	
Intersection	**Movement**	**AM Peak LOS**	**PM Peak LOS**	**AM Peak LOS**	**PM Peak LOS**
Komohana St. at Nowelo St.	Northbound Left turn*	A	B	A	B
	Northbound Thru/Right*	C	A	D	B
	Southbound Left turn *	F	A	F	A
	Southbound Thru/Right *	A	B	A	C
	Eastbound Left/Thru**	F	C	F	C
	Eastbound Right **	F	C	F	C
	Westbound Left/Thru**	F	C	F	D
	Westbound Right**	F	C	F	C
	Total	**C**	**B**	**E**	**B**
Nowelo St. at Proposed UHH Site Access	Eastbound Thru/Right	NA	NA	NA	NA
	Westbound Thru/Right	NA	NA	A	A
	Site Driveway Exit onto Nowelo St.	NA	NA	B	B
	Total	NA	NA	A	A
Nowelo St. from Komohana St. to New UHH Access	Eastbound	C	C	C	C
	Westbound	C	C	C	C

* motor vehicle starts on Komohana Street ** motor vehicle starts on Nowelo Street

exception of certain left-turns. The long cycle length coupled with the low percentage of green time accounts for the predicted delay and LOS for these movements. Signal timing changes could balance the LOS decline. Although the County of Hawai‘i may wish to consider signal timing changes to improve these LOS for traffic on Nowelo Street, any changes in signal timing to better serve the side street and the southbound left turn will cause greater delays and a decline in LOS for the mainline on Komohana Street which carries a large volume of traffic.

In addition to the analysis using LOS and delay criteria, a review was also made of other design considerations. In particular, the issue of the need to improve the Komohana Street/Nowelo Street intersection by adding a right turn lane was reviewed. Analysis indicated that a right turn lane should be considered on the northbound (from Komohana Street) approach of the Komohana Street/Nowelo Street intersection, with or without the project. Modeling indicates considerable improvement in the intersection's LOS with a right turn added for the northbound movement in the AM peak hour.

The traffic engineer also examined the traffic needs of the project driveway's intersection with Nowelo Street using American Association of State Highway and Transportation Officials (AASHTO) criteria. The intersection of Nowelo Street at the proposed new access point does

not meet the AASHTO criteria for addition of a left turn lane westbound on Nowelo Street, and this movement is expected to have good levels of service for the morning and afternoon peak hours. Analysis indicated that the location would barely meet the warrant for right turn lane improvements in the morning peak hour, but only for a taper and not a full right turn lane. It is impractical to build tapers in most cases and, since a full right turn lane is not warranted, it is not recommended based on this guideline.

Conclusion and Mitigation

In conclusion, the project's 86 trips in the AM peak and 32 trips in the PM peak hour would have a minimal overall impact on traffic operations on Komohana Street and Nowelo Street. The proposed College of Hawaiian Language project traffic can be handled adequately by a single two-lane driveway access with a single entry lane and a single exit lane. No turning lanes are necessary on Nowelo Street based on predicted traffic volumes. A driveway design with adequate turning radii will be needed, along with STOP sign traffic control. With or without the project, there is a marginal need for a right turn lane on the northbound approach of the intersection of Komohana Street at Nowelo Street as a result of this project.

The following mitigation measures are recommended:

- Provide a design for the proposed access to the College of Hawaiian Language with one entry lane and one exit lane and adequate turning radii. The driveway should be designed to accommodate buses which will drop off and pick children attending classes and performances at the facility, as well as routine delivery trucks.
- Provide a standard STOP sign for control of exiting traffic from the proposed access point.
- Discuss with the County of Hawai‘i the possible addition of a right turn lane northbound on Komohana Street at Nowelo Street. A right turn lane would be beneficial to existing and future traffic with or without the proposed project.
- Contact the County of Hawai‘i regarding the timing of the traffic signal at the intersection of Komohana Street at Nowelo Street. Slight adjustments may be necessary to accommodate additional traffic on the Nowelo Street approaches, as well as the southbound approach on Komohana Street.

This Environmental Assessment process provides initial contact with the County of Hawai‘i regarding the last two mitigation measures.

3.4 Secondary and Cumulative Impacts

Because it involves relocation of existing UH Hilo offerings, the proposed project would not involve major secondary or cumulative impacts, such as population changes or effects on public facilities, except that it would alleviate usage of UH Hilo facilities where those offerings are currently provided. Although the project would provide short-term construction jobs, these would largely be filled by local residents and would not induce in-migration.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project – minor and temporary disturbance to air quality, noise or visual quality during construction – are limited in severity, nature and geographic scale, except construction and operational traffic, which require consideration related to cumulative impacts. There are currently several roadway and development projects planned for the Waiākea area in the next ten years that could combine in such a way as to produce adverse construction-phase effects (see Figure 1 for location). Although the Traffic Impact Assessment Report contained in Appendix 2 and summarized above includes complete consideration of the impact of additional operational traffic from these projects, a separate discussion in the context of construction-phase traffic, air quality, water quality, scenic and noise impacts, is useful.

A number of facilities are under construction or planning at the UH Hilo campus, including the Student Life and Events Center, the China-U.S. Center, and the Science and Technology Building. Other projects in the immediate vicinity of the campus include the Puainako Street Widening Project, the Pacific Basin Agricultural Research Center, and possible relocation of Hawai‘i Community College.

Many of these projects are located in the makai or eastern section of the UH Hilo campus, and there is little potential for impact interaction, as most traffic will be restricted to Kawili Street or Lanikaula Street areas and the roads that feed into them, such as Puainako Street and Mohouli Street.

- The new Student Life Center opens its doors in 2008. The 22,600-square-foot structure adjacent to the Athletic Complex represents Phase I of the full Student Life and Events Center development and will provide students with a wide range of health, fitness and recreational activities. The building's features will include a fitness room, aerobics, martial arts, human performance testing, an Olympic-size swimming pool, a covered deck, classrooms, lockers, and shower and weight room facilities along with a juice bar or indoor café where students can dine and congregate.
- A new $28 million Science and Technology building is scheduled for construction in early 2008 near the existing Life Sciences Building. Modern offices, classrooms, introductory and advanced undergraduate labs, and faculty research facilities will be constructed.
- Nearby, the federal government has budgeted $36.3 million for planning, design, construction and equipment for a USGS Pacific Island Ecosystems Research Center. USGS will cooperate with UH Hilo in research and provide space for UH Hilo teaching and research use.
- The proposed China-U.S. Center will consist of dormitories, commercial buildings, and conference/hotel space on 33 acres of land.

Other projects are located on the mauka, western portion of campus, and construction activities of these projects could interact, particularly if construction vehicles from combined projects are allowed to impede traffic and affect air quality and noise.

- Construction of the remaining portion of the Puainako Street Extension and Widening Project, for which a joint federal-State EIS was conducted (Hawai‘i County Department of Public Works. 2000), will involve traffic disruption on Komohana Street that may interact with construction of the College of Hawaiian Language, depending on timing. Long-term, the Puainako Extension is expected to significantly benefit circulation in the upper Waiākea area.
- The U.S. Department of Agriculture Pacific Basin Agricultural Research Center (PBARC) facilities on the portion of Nowelo Street mauka of Komohana Street are nearing completion. Already home to USDA Forestry and other offices, a $19-million, 35,000-square-foot office and laboratory structure for PBARC was dedicated on May 29, 2007. Additional PBARC facilities are in planning.
- The Komohana Research and Outreach Center, located south of the University Park on Komohana Street, will receive $14 million to renovate and develop state-of-the-art laboratories, offices and laboratory support spaces.
- An area mauka of Komohana Street and south of Mohouli Street has been discussed as a site for the relocation of Hawai‘i Community College, which has over 3,000 students. Depending on timing, there might be significant interaction in construction traffic.

As the timing and even the certainty of many of these projects is currently unknown, no specific plans to mitigate for cumulative construction-phase impacts are yet possible. It is important for the project proponents to be aware of the potential for adverse interaction; for this reason, the Draft EA has been provided to relevant agencies and continuing coordination is important.

3.5 Required Permits and Approvals

The following permits and approvals would be required:

- County of Hawai‘i, Department of Public Works, Building Division Approval and Building Permit
- County of Hawai‘i, Planning Department Plan Approval
- County of Hawai‘i, Planning Director ~~Commission~~ Height Variance
- County of Hawai‘i, Department of Public Works, Engineering Division, Grading Permit and Driveway Permit; Drainage Approval
- State of Hawai‘i, Department of Health, National Pollutant Discharge Elimination System Permit (NPDES)

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State's long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by enhancing educational facilities on the Island of Hawai‘i, thereby enhancing quality-of-life and community and social well-being.

3.6.2 Hawai‘i County General Plan and Zoning

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Department of Planning). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Goal and Policies, and Courses of Action:

EDUCATION – GOALS

- Utilize publicly owned lands in the best public interest and to the maximum benefit.

EDUCATION – COURSES OF ACTION

- Encourage the establishment of additional schools as the need arises.
- Support the continued expansion of the University system and the University of Hawaii at Hilo and Hawaii Community College campus and encourage the continuing education programs throughout the community.
- Encourage continual improvements to existing educational facilities.
- Encourage the implementation of existing State and University of Hawaii plans for the continued development of the "Research and Technology Park" on the campus of the University of Hawaii at Hilo.

The Hawai‘i County General Plan, adopted in 2005, notes that the "University of Hawaii at Hilo Long Range Development Plan," which was last updated in 1996, emphasizes the "spine" concept that organizes all campus structures along a main pedestrian accessway, which Nowelo Street provides, and assures that future development would continue in relation to the various existing structures. As such, new facilities would be developed towards Komohana Street, as this project is designed.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to educational facilities in Hawai‘i County.

The *Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG)*. The LUPAG map component of the *General Plan* is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as University Use ~~Low Density Urban~~ in the LUPAG. The proposed project is ~~basically~~ fully consistent with this designation.

Hawai‘i County Zoning. The project parcel is zoned RS-10 (Single-Family Residential) ~~and A-1a (Agricultural)~~, and the proposed project is consistent with this designation, provided the Planning Director issues Plan Approval. A new zoning category for the University District was approved by the County Council per Hawai‘i County Ordinance No. 07 104, effective August 1, 2007. UH Hilo may include the area in an application for a change of zone to this more appropriate district at some time in the future. The property is not situated within the County's Special Management Area (SMA).

3.6.3 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Urban District. The proposed use is consistent with intended uses for this Land Use District.

PART 4: DETERMINATION

As supported by the findings below and below and in consideration of the comment letters on the Draft EA, the University of Hawai‘i has determined that the proposed project will not significantly alter the environment, as impacts will be minimal, and has issued a Finding of No Significant Impact (FONSI).

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost. The surrounding area is university-related, and will directly benefit by the project.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project expands and in no way curtails beneficial uses of the environment.
3. *The proposed project will not conflict with the State's long-term environmental policies*. The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State's long-term environmental policies.
4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project will benefit the social welfare of the community.
5. *The proposed project does not substantially affect public health in any detrimental way.* The proposed project will benefit public health by increasing access to educational opportunities.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. No secondary effects are expected to result from the proposed action, which would improve educational facilities and would not induce significant in-migration or affect public facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality*. The project is environmentally benign, and would thus not contribute to environmental degradation.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The project is not related to additional activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions. Cumulative traffic

impacts have been accounted for in the analysis and recommendations of the Traffic Impact Analysis Report.

10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts will preserve water quality. Ambient noise impacts due to construction will be temporary and restricted to reasonable daytime hours.
11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project is located in an area with volcanic and seismic risk, the entire Island of Hawai‘i shares this risk, and the project is not imprudent to construct, and employs design and construction standards appropriate to the seismic zone.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas and viewplanes identified in the Hawai‘i County General Plan will be adversely affected by the project. The building will be as high as 60 feet in places, but given the ground elevation at 195 feet, and the elevation of the nearest major viewplane on Komohana Street at 320 feet, no interference with views will occur.
13. *The project will not require substantial energy consumption*. Construction and maintenance of the facility would require additional consumption of energy, which will be reduced through green design in conformance with the silver LEED designation. No adverse effects on the ability of the electrical utility to supply power to the island are expected.

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ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAIʻI AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 1

PUBLIC INVOLVEMENT

Part A: Comments in Response to Early Consultation

Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

June 5, 2007

Mr. Ron Terry
Geometrician Associates
P. O. Box 396
Hilo, Hawaii, 96721

Dear Mr. Terry:

Re: Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawaii at Hilo

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

Sincerely,

James M. Day

JAMES M. DAY
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

KV:lli

LINDA LINGLE
GOVERNOR

BARRY FUKUNAGA
DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

HWY-H 07-2.0617

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HAWAII DISTRICT
50 MAKAALA STREET
HILO, HAWAII 96720
TELEPHONE: (808) 933-8866 • FAX: (808) 933 8869

June 7, 2007

Mr. Ron Terry
Principal
Geometrician Associates, LLC
HC 2 Box 9575
Kea'au, Hawai'i 96749

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawaii at Hilo, Island of Hawaii
T.M.K. 3rd Div. 2-4-001:007
Project No. STP 2000 (3)
Route 2000, Puainako Street/Puainako Street Extension
Waiakea Cane Lots, Waiakea, South Hilo, Island of Hawai'i, Hawai'i

Komohana Street is under the jurisdiction of the County of Hawaii. The Department of Transportation, Highways Division remains an interested agency as the roadway connects to our highway system.

Please send copies of the Environmental Assessment to our Department for review and comment.

Our Department will then further distribute the copies to the appropriate divisions and branches at which time we will review and provide comments. After all comments are received and coordinated, a response from the director will be sent to the County Department approving agency.

Please note that at this time we will not be able to provide comments without pre-empting the departmental response.

If you have any questions please call Mr. Clinton Yamada at 933-1951.

Very truly yours,

STANLEY M. TAMURA
Hawai'i District Engineer

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 8, 2007

Geometrician Associates, LLC
Box 396
Hilo, Hawaii 96721

Attention: Mr. Ron Terry

Gentlemen:

Subject: Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawaii at Hilo, Hawaii, Tax Map Key: (3) 2-4-1:portion 7

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Land Division Hawaii District, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

May 31, 2007

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
__Engineering Division
__Div. of Forestry & Wildlife
___Div. of State Parks
__Commission on Water Resource Management
__~~Office of Conservation & Coastal Lands~~
x Land Division Hawaii District

FROM: Russell Y. Tsuji

SUBJECT: Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawaii at Hilo

LOCATION: Hilo, Hawaii, Tax Map Key: (3) 2-4-1:portion 7

APPLICANT: Geometrician Associates, LLC on behalf of the University of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 20, 2007.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____
Date: 6/05/07

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

75 Aupuni Street, Room 204
Hilo, Hawaii 96720
PHONE: (808) 974-6203
FAX: (808) 974-6222

June 5, 2007

TO: **Russell T. Tsuji, Administrator**
DLNR-Land Division

FROM: **Gordon Heit, Land Agent**
Hawaii District Land Office

SUSPENSE DATE: **June 20, 2007**

SUBJECT: **Request for Comments, Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawaii at Hilo, South Hilo, Hawaii, TMK: 3rd/2-4-01:portion of 07.**

HDLO staff has reviewed the University of Hawaii's request for an early consultation EA and has comments pertaining to the above-mentioned property.

The property is currently encumbered under GL S-4919 issued to the University of Hawaii in 1982. The purpose of the lease is for the expansion of the Hilo campus including associated research and instructional programs. As such, the proposed request is an allowed use under the terms of the lease.

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

June 27, 2007 HRD07_3062

Ron Terry, Principle
Geometrician Associates, LLC
P.O. Box 396 Hilo, Hawai'i 96721

Dear Mr. Terry:

Re: Early Consultation for Environmental Assessment for Hawaiian Language College at the University of Hawai'i at Hilo, Island of Hawai'i, TMK 2-4-1:007 (por.)

The Office of Hawaiian Affairs is in receipt of your May 29, 2007 letter seeking preliminary comments ahead of the above forthcoming draft Environmental Assessment (EA).

OHA has no comments at this time and requests a copy of the draft EA when it is completed, along with the opportunity to provide comments at that time.

Thank you for contacting OHA at this early stage of the EA process. Should you have any questions, please contact Keola Lindsey, Lead Advocate- Culture at (808) 594-1904 or keolal@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

C: Lukela Ruddle, OHA Community Resource Coordinator- East Hawai'i
162 A Baker Avenue, Hilo, Hawai'i 96720-4869

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKUANAO'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

June 27, 2007

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, HI 96721

PRE-ENVIRONMENTAL ASSESSMENT
HAWAIIAN LANGUAGE COLLEGE AT THE UNIVERSITY OF HAWAII AT HILO
TAX MAP KEY 2-4-001:007 (PORTION)

This is in response to your Pre-Environmental Assessment letter dated May 29, 2007.

Water can be made available from an existing 12-inch waterline within Nowelo Street. Prior to issuing a water commitment for the proposed project, the Department requests estimated maximum daily and peak hour water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for review. After review of the calculations, the Department will determine the water commitment deposit amount, facilities charges due, and other conditions for final approval.

Please be informed that the proposed facility will require that there be 2,000 gallons per minute available at the site for fire protection.

Please also be informed that any meter(s) serving the proposed project will require the installation of a reduced principle type backflow prevention assembly within five feet of the meter on private property. The Department must inspect and approve the installation prior to commencement of water service.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager

FM:dfg

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Harry Kim
Mayor

Christopher J. Yuen
Director

Brad Kurokawa, ASLA
LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-3043
(808) 961-8288 • FAX (808) 961 8742

June 28, 2007

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo HI 96721

Dear Mr. Terry:

SUBJECT: Pre-Environmental Assessment Consultation
Applicant: University of Hawaii at Hilo
Land Owner: State of Hawaii
Project: Hawaiian Language College
TMK: 2-4-1:Portion of 7

This is in response to your request for comments on the above-referenced project.

According to your submittal, the University of Hawaii at Hilo proposes to provide a unified and contiguous facility to house the College of Hawaiian Language which currently consists of several distinct entities that are spread throughout the existing campus.

We have the following to offer on the subject parcel:

1. This parcel is designated Urban by the State Land Use Commission.

2. The General Plan designation is University, which is characterized as *"Public university, including ancillary public uses, residential, and support commercial uses"*.

3. The County zonings are Single-Family Residential (RS-10) and Agricultural (A-1a).

4. The project is not located within the County's Special Management Area.

5. Plan Approval is required to establish the proposed structures.

For your information, Bill 326 to add a new division entitled "UNV, University District" to the Hawaii County Zoning Code will be up for second and final reading at the County Council meeting on July 10, 2007. A height limit of 60 feet is proposed for this new district.

Please provide us with a copy of the Draft Environmental Assessment for our review and file.

If you have questions, please feel free to contact Esther Imamura of this office at 961-8288, extension 257.

Sincerely,

CHRISTOPHER J. YUEN
Planning Department

ETI:mad
P:\wpwin60\ETI\EAdraft\Pre-consul\Terry UH Hawn Lang College rtf

ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAI`I AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 1

PUBLIC INVOLVEMENT

Part B: Comments on Draft EA and Responses

Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

December 18, 2007

Mr. Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Re: Draft Environmental Assessment for University of Hawaii at Hilo College of Hawaiian Language Facilities; South Hilo, Hawaii TMK: (3rd) 2-4-01:07

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

Sincerely,

James M. Day
JAMES M. DAY
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

James M. Day, Asst. Police Chief
Hawaii County Police Department
349 Kapiolani Street
Hilo HI 96720

Dear Mr. Day:

Thank you for your comment letter dated June 5, 2007, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities, in which you stated that you had did not anticipate any significant impact to traffic and/or public safety concerns. We appreciate your review of the document.

Sincerely,

for Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
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STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD07/3062 B

December 20, 2007

Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721

RE: Request for comments on the Draft Environmental Assessment for the proposed construction of the new facility for the University of Hawai'i at Hilo's College of Hawaiian Language, TMK: (3) 2-4-01:07.

Dear Ron Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-referenced Draft Environmental Assessment for the construction of the University of Hawai'i at Hilo's College of Hawaiian Language complex, which will include three structures for administrative offices, classrooms and preschool and daycare facilities. The project is slated for a four-acre parcel on previously undeveloped, former sugar cane and dairy farm pasture land. OHA offers the following comments.

We appreciate that the project will be developed within the Leadership in Energy and Environmental Design and will meet standards for a silver certificate in the "green building" rating system.

In addition, we appreciate that the architectural style of the facility will be Hawaiian and that the complex's landscaping will primarily feature native plants. The Hawaiian landscaping and architecture will create a more Hawaiian sense of place.

We will rely on the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the facility, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

C: Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Maynard G.P. Young
University of Hawai'i
1960 East West Road
Biomed Sci. Bldg. Ctyd. B-102
Honolulu, HI 96822

UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

Clyde Nāmu'o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 1250
Honolulu HI 96813

Dear Mr. Nāmu'o :

Thank you for your comment letter dated December 20, 2007, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities. We offer the following in response to your individual comments.

1. *LEED and architectural style*. We are gratified that our efforts in sustainable design and appropriate architecture are recognized.
2. *Iwi kupuna and Native Hawaiian cultural and traditional deposits*. As stated in the Draft EA, we can assure you that contractors will be strictly instructed that if human skeletal remains or undocumented archaeological resources are encountered during future development activities within the current study area, work in the immediate area of the discovery must be halted and the State Historic Preservation Division contacted.

Thank you again for your comment.

Sincerely,

for Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
Telephone: (808) 974-7750, Facsimile: (808) 974-7542, www.uhh.hawaii.edu
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Harry Kim
Mayor

Bobby Jean Leithead-Todd
Director

Nelson Ho
Deputy Director

County of Hawai'i

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 · Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

December 21, 2007

Mr. Ron Terry
Geometrician Associates
P. O. Box 396
Hilo, HI 96720

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
UNIVERSITY OF HAWAI'I AT HILO COLLEGE OF HAWAIIAN LANGUAGE FACILITIES
SOUTH HILO, HAWAI'I
TMK: 2-4-01:07

We have reviewed the subject request and have no comments to offer.

Thank you for allowing us to comment on this project.

Bobby Jean Leithead Todd
DIRECTOR

cc: Director, OEQC
Hawai'i of Hawai'i Office of Capital Improvements

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10241A

UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

Bobby Jean Leithead Todd, Director
Hawai'i County Department of Environmental Management
25 Aupuni Street
Hilo HI 96720

Dear Ms. Leithead-Todd:

Thank you for your comment letter dated December 21, 2007, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities, in which you stated that you had no comments to offer. We appreciate your review of the document.

Sincerely,

Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
Telephone: (808) 974-7750, Facsimile: (808) 974-7542, www.uhh.hawaii.edu
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Harry Kim
Mayor

Christopher J. Yuen
Director

Brad Kurokawa, ASLA
LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224
(808) 961-8288 • FAX (808) 961-8742

January 2, 2008

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo HI 96721

Dear Mr. Terry:

SUBJECT: Draft Environmental Assessment
Applicant: University of Hawaii at Hilo
Land Owner: State of Hawaii
Project: Hawaiian Language Facilities
TMK: 2-4-1:Portion of 7

This is to acknowledge receipt on December 10, 2007 of your request for comments on the proposed College of Hawaiian Language facility for a portion of the subject parcel at the University of Hawaii at Hilo.

Currently, the Hawaiian language and Hawaiian studies courses are spread among five existing buildings at UH Hilo and another building located six miles from campus. The new facility will accommodate the college's existing entities as well as future growth. Phase 1 will include a two-story building for administrative offices and classrooms and two separate one-story structure for day care and preschool facilities, connected by covered walkways, with associated parking, utilities, and landscaping. Phase 2 will create Hale Kuamo'o, an 8,600 square foot facility to house the teacher training program, curriculum development and media/telecommunications services. An additional pedestrian mall will connect to Nowelo Street. Phase 3 will include graduate student facilities of approximately 20,000 square feet.

With reference to our letter dated June 28, 2007, and additional information provided in the Draft Environmental Assessment, we would like to provide corrections and also supplement our earlier comment:

1. **3.5 Required Permits and Approvals**
   County of Hawaii, Planning Commission Height Variance:
   An application for a variance from the height limit would be submitted to the Planning Director and not to the Planning Commission.

2. **3.6.2 Hawaii County General Plan and Zoning**
   According to the General Plan Land Use Pattern Allocation Guide Map, the subject area is designated as "University" and not "Low Density Urban".

   After review of the Site Plan, we have determined that the project site is in the Single Family Residential (RS-10) zoned district. According to the Hawaii County Code, §25-5-3(a)12), *"Public uses and structures, as permitted under section 25-4-11"* are permitted within the RS-10 district. Hawaii County Code, §25-4-11(c) states that *"Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use".*

3. **1.4 Public Involvement and Agency Coordination**
   Although not required, we recommend that the County of Hawaii, Fire Department also be consulted.

If you have questions, please feel free to contact Esther Imamura of this office at 961-8288, extension 257.

Sincerely,

/s/ CHRISTOPHER J. YUEN
Planning Department

ETI:cd
P:\wpwin60\ETI\EAdraftPre-consul\Terry UH Hawn Lang College 2 07.rtf

xc: Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu HI 96813

cc: Mr. Maynard G.P. Young
University of Hawaii
Office of Capital Improvements
1960 East West Road
Biomed Sci. Bldg. Ctyd. B-102
Honolulu HI 96822

UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

Christopher J. Yuen, Director
Hawai'i County Planning Dept.
101 Aupuni Street, Suite 3
Hilo HI 96720

Dear Mr. Yuen:

Thank you for your comment letter dated January 2, 2008, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities. We offer the following in response to your individual comments.

1. *Height Variance to Planning Director.* This information has been corrected in the Final EA.
2. *LUPAG designation and zoning.* The LUPAG information has been corrected in the Final EA. Thank you for your further work determining the zoning of the site. This information has been added to the Final EA.
3. *Public involvement.* In deference to your concerns, the Fire Department will be provided a copy of the Final EA.

Thank you again for your comment.

Sincerely,

for Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
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345 KEKUANAO'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

January 9, 2008

Mr. Ron Terry
Geometrician Associates, LLC
P. O. Box 396
Hilo, HI 96721

DRAFT ENVIRONMENTAL ASSESSMENT
HAWAIIAN LANGUAGE COLLEGE AT THE UNIVERSITY OF HAWAII AT HILO
TAX MAP KEY 2-4-001:007 (PORTION)

We have reviewed the subject Draft Environmental Assessment and have no further comments at this time. Our comments from our June 27, 2007, letter to you still stand.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager

FM:dfg

copy - Office of Environmental Quality Control
University of Hawaii, Office of Capital Improvements

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UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

Milton Pavao, Manager
Hawai'i County DWS
345 Kekuanaoa Street, Suite 20
Hilo HI 96720

Dear Mr. Pavao:

Thank you for your comment letter dated January 9, 2008, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities, in which you stated that you had no further comments to offer. We appreciate your review of the document.

Sincerely,

for Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
Telephone: (808) 974-7750, Facsimile: (808) 974-7542, www.uhh.hawaii.edu
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LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 11, 2008

Geometrician Associates, LLC
Box 396
Hilo, Hawaii 96721

Attention: Mr. Ron Terry

Gentlemen:

Subject: Draft Environmental Assessment for University of Hawaii at Hilo College of Hawaiian Language Facilities, Hilo, Hawaii, Tax Map Key: (3) 2-4-1:7

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator

UNIVERSITY OF HAWAI'I AT HILO

Administration
Administrative Affairs

February 21, 2008

Morris Atta, Administrator
Land Division.
Hawai`i State DLNR Land Division
P.O. Box 621
Honolulu HI 96809

Dear Mr. Atta:

Thank you for your comment letter dated January 11, 2008, on the Draft Environmental Assessment (EA) for the UH-Hilo Hawaiian Language College Facilities, in which you stated that you had no comments to offer. We appreciate your review of the document.

Sincerely,

Debra Fitzsimons
Vice Chancellor

cc: Ron Terry, Ph.D., Project Environmental Consultant
Geometrician Associates

200 W. Kawili Street, Hilo, Hawai'i 96720-4091
Telephone: (808) 974-7750, Facsimile: (808) 974-7542, www.uhh.hawaii.edu
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ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAIʻI AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 2

TRAFFIC IMPACT ANALYSIS REPORT

TRAFFIC IMPACT ANALYSIS REPORT

for

The University of Hawaii at Hilo
Ka Haka ʻUla O Keʻelikōlani
Hawaiian Language Building

Prepared for:

The University of Hawaii at Hilo

September 13, 2007

Prepared By

SSFM INTERNATIONAL, INC.
Project Managers, Planners, & Engineers

101 Aupuni Street, Suite 315
Hilo, Hawaiʻi 96720
Phone: (808) 933-2727
Fax: (808) 887-8885
Email: contact_us@ssfm.com

TRAFFIC IMPACT ANALYSIS REPORT

FOR

The University of Hawaii at Hilo
Ka Haka ʻUla O Keʻelikōlani
Hawaiian Language Building

HILO, HAWAIʻI

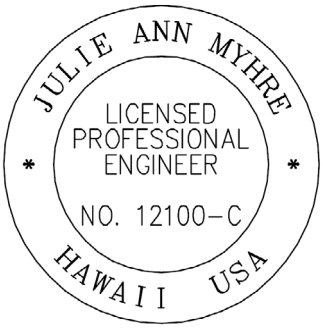
September 13, 2007

PREPARED FOR:

The University of Hawaii at Hilo

PREPARED BY:

SSFM International Inc.
101 Aupuni Street, Suite 315
Hilo, Hawaiʻi 96720



This work was prepared by
me or under my supervision

Julie Ann Myhre
Licensed Professional Engineer
Certificate Number 12100-C
Expires: April 2008

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I. PROJECT DESCRIPTION

The University of Hawaii at Hilo (UHH) Ka Haka ʻUla O Keʻelikōlani Hawaiian Language Building (HLB) will be constructed on a site that is currently vacant on Nowelo Street in the western portion of the UHH campus. The site location is shown in figure 1.

The HLB will provide a Hawaiian Language emersion program for current UHH students and children of the community. The facility will contain areas devoted to teaching units, meeting rooms and performance areas. It will also have play areas for children attending classes and performances.

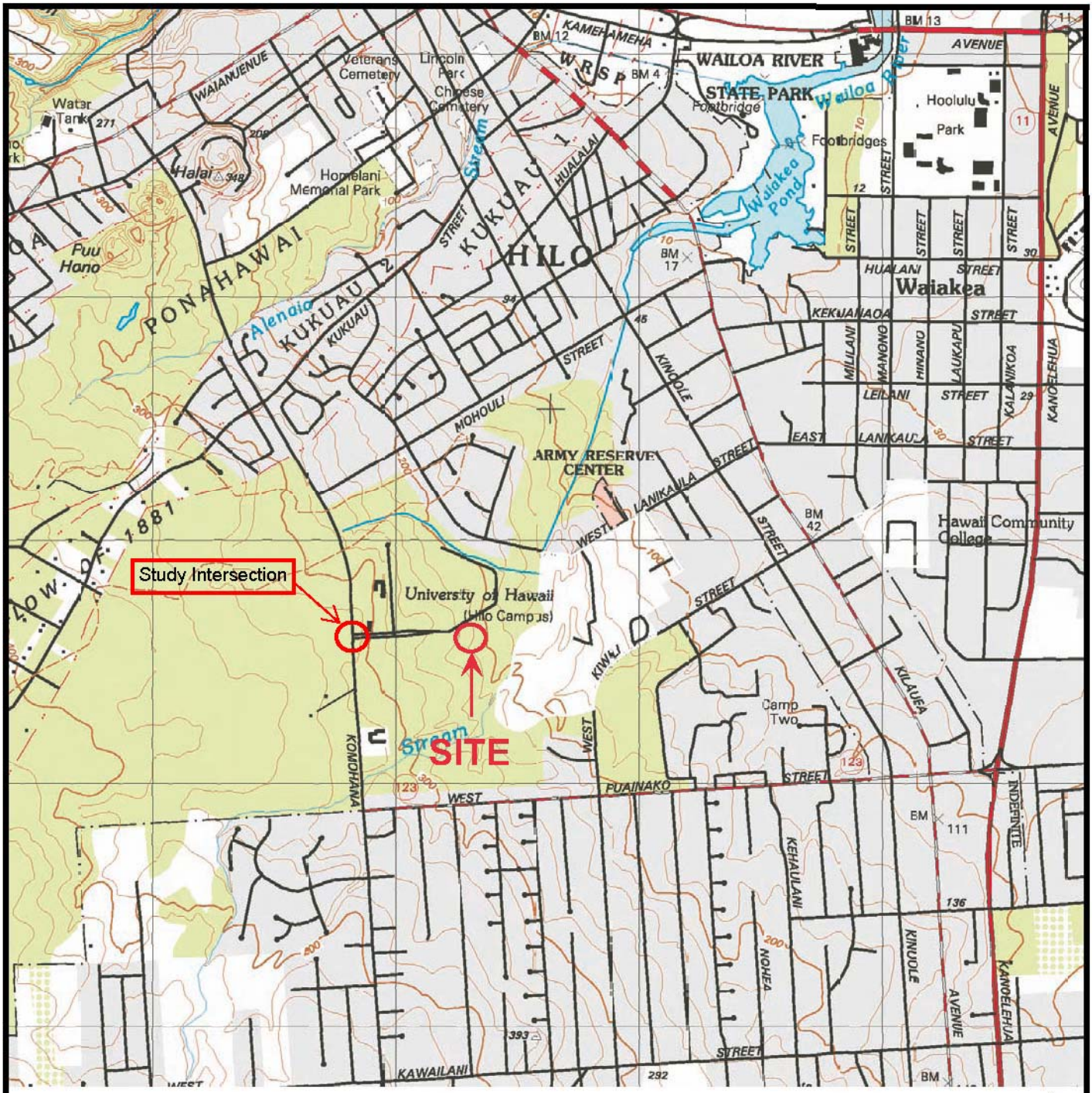
Based on notes from facility planning meetings, the six major functions envisioned for the complete facility are:

1. Administration
2. Instruction
3. Media and Communications
4. Toddler through Pre-school
5. Exchange Program (including dormitory, kitchen, dining room and performing arts area)
6. Hawaiian Language Center

The full-time enrollment (FTE) is estimated at over 200 students, as indicated in the table below:

Classification	Program	FTE
Students	BA program	100
	MA program	8
	Teacher Trainees	15
	MA in Teachers' Education	14
	PhD program	5 (to 10)
	Early Childhood Education	20 (to 25)
Faculty	Tenured	6
	On tenured track	4
	Open positions	2
	Lecturers	14 (to 18 in Fall)
Hale Kuamo'o	Clerical plus 1 Student Worker	5
	Full Time Curriculum Development R&D Staffers	9
	Tutors	2
	Career Academic Guidance Counselor	1
TOTAL		205 (to 219)

The proposed conceptual site plan is shown in figure 2. Access is proposed from Nowelo Street only.



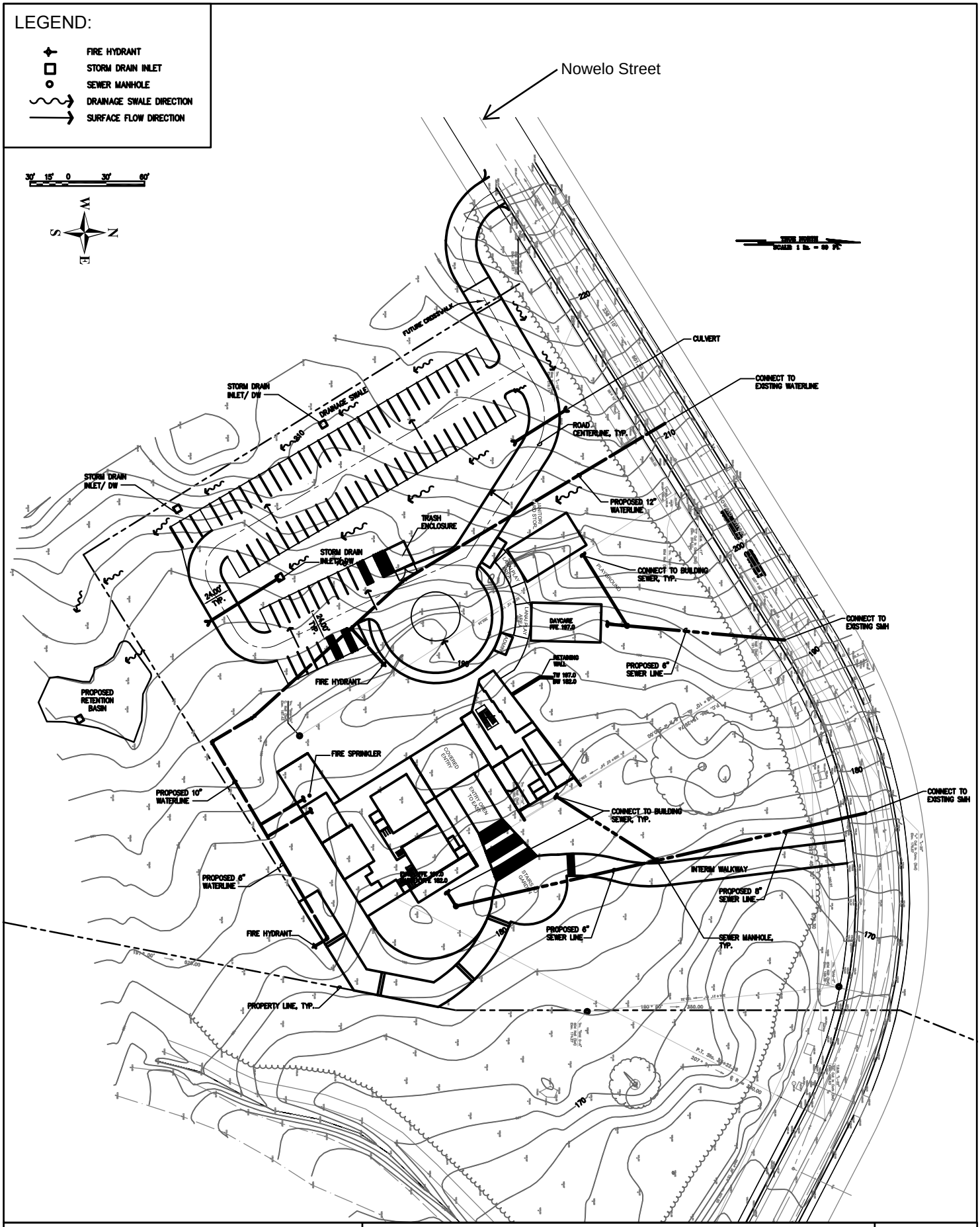
Source: USGS Topographic Map, 1998

Figure 1. Site Location

Phase I ESA
Hawaiian Language Building
University of Hawaii at Hilo
Hilo, Hawaii 96720

November 2006
Job No. 20510

Myounghee Noh & Associates, L.L.C.



SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

COLLEGE OF HAWAIIAN LANGUAGE
UNIVERSITY OF HAWAI`I AT HILO

CONCEPTUAL SITE PLAN

SCALE: 1 : 1,193

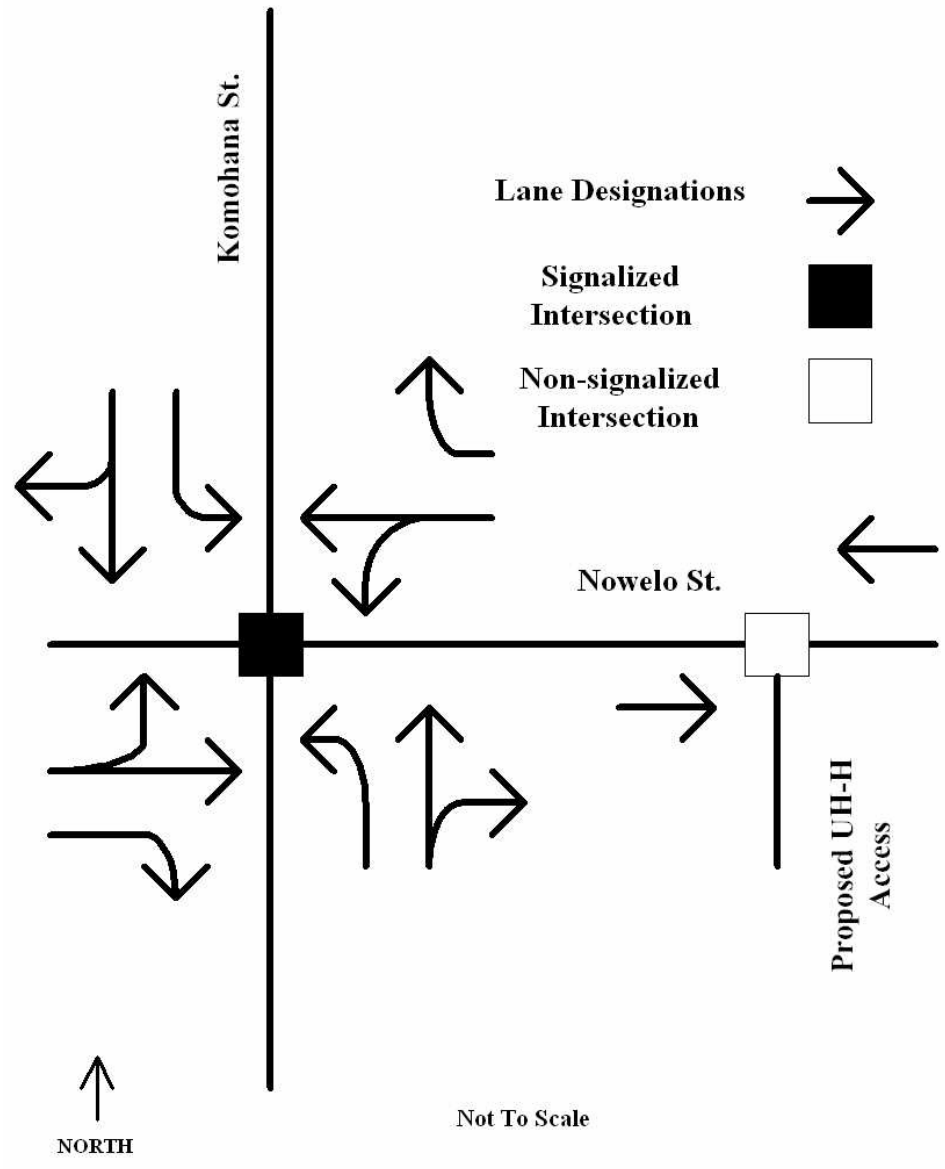
DATE: September 2007

FIGURE 2

The purpose of this study was to determine the predicted impacts to traffic flow on the study network which consisted of the following intersections:

- Komohana Street at Nowelo Street
- Nowelo Street at the proposed access to the UHH HLB
- The segment of Nowelo Street between Komohana Street and the proposed access to the UHH HLB

A generalized view of the study network is provided below.



II. STUDY METHODOLOGY

This study was conducted in conformance to the Institute of Transportation Engineers (ITE) publication "Access and Impact Studies for Site Development." The guidelines in this manual are generally accepted by HDOT and the County of Hawai'i as the preferred method for preparing traffic studies for land development projects.

The approach consisted of assessing existing conditions, predicting background traffic growth, and assessing traffic conditions in the year of full buildout of the project for both the no-build and build conditions. It was determined that the project should be fully built and occupied by the year 2010. Therefore, this study made assessments of traffic conditions in the year 2007 and in the year 2010 with and without the development in place.

Predicted traffic volumes resulting from the generation of traffic created by the site development were added to existing plus background growth to derive future traffic volumes with the site fully developed. The Highway Capacity Manual (HCM) was used to assess traffic conditions and Level of Service (LOS) for the intersections in the study area. The Synchro software was used to apply the HCM methods.

The primary measure of traffic flow quality for the study used the concept of LOS as defined by the HCM. Generally, for intersections the concept of LOS relates the quality of traffic flow to the delay time experienced by drivers. The HCM provides guidance on the use of the concept of level of service for streets and intersections. A tiered system has been established to describe traffic flow and congestion as related to observed and measured or predicted operational values. For intersections, the measure is stopped time delay. The following figure provides the HCM criteria for LOS for intersections. As noted, the LOS varies from "A" to "F", with the quality of traffic service declining as the levels move from "A" towards "F". With declining LOS, the ability to travel at the desired speed is inhibited by other vehicles either adjacent, opposite, or in front of a driver. Generally, in urban areas and growing rural areas transitioning to urban areas, it is expected that LOS D will be prevalent and be accepted in the morning and afternoon peak hours. So, any traffic movements with LOS E or worse would need to be reviewed closely to determine if any changes or improvements could be made to move the LOS to an acceptable level. Table 1 indicates LOS and the thresholds of delay for signalized and non-signalized intersections:

Table 1
Levels of Service for Intersections*

Level of Service	Signalized Intersections	Non-signalized Intersections
	Vehicular Delay (Seconds)	Vehicular Delay (Seconds)
A	< 10	<10
B	10 – 20	10 - 15
C	20 – 35	15 - 25
D	35 – 55	25 - 35
E	55 – 80	35 - 50
F	> 80	> 50

*From Highway Capacity Manual, 2000 Edition, Transportation Research Board.

Level of service is graded from A to F to indicate increasing congestion, longer delays and greater limitation in mobility to drivers. Normally, level of service D is considered acceptable at intersections in an urban area. Similar statements can be made for non-signalized intersections, for example that LOS is C if the average delay is less than 25 seconds. Level of service E is generally considered to be "capacity." Level of service F indicates a condition where capacity has been exceeded and long queues develop.

To assess the level of service for the section of street on Nowelo Street between Komohana Street and the proposed UHH HLB access point, a method developed by the Florida Department of Transportation was used. This method uses the concepts of the HCM and provides a list of one-way lane volumes for sections of streets between intersections. Information about this analysis method is included in appendix E. Based on the street and area conditions for Nowelo Street, the thresholds for LOS are as shown below:

Table 2
LOS Maximum One-Way Lane Volumes for Nowelo Street

LOS	Maximum One-way Hourly Volume (vph)	V/C Ratio
A	*	*
B	*	*
C	≤ 250	≤ 0.25
D	251 to 530	0.25 to 0.80
E	531 to 660	0.80 to 1.0
F	> 660	> 1.0

* Not generally considered attainable.

III. EXISTING CONDITIONS

A. Roadways

The site is located on Nowelo Street about 1,475 feet to the east of the intersection of Komohana and Nowelo Street. It is located in the western section of the UHH campus, which is growing with several potential new facilities under consideration. Nowelo Street has two travel lanes and a raised dividing median in each direction at its intersection with Komohana Street. However, the street reduces down to one lane in each direction at its intersection with North Aʻohōkū Street which is located about 475 feet from the intersection at Komohana Street. The posted speed limit on Nowelo Street is 20 mph and the street has sidewalks. There is curb and gutter in place on the route, which is basically flat and on a tangent section. The estimated annual average daily traffic for Nowelo Street at the site is approximately 1,820.

Komohana Street is a major arterial street serving Hilo, connecting from West Pūʻāinakō Street to Mohouli Street. Komohana Street is basically a three-lane street at its intersection with Nowelo Street and has a left turn lane and a combination through/right turn lane in each direction. The street has a paved shoulder of about six feet and no sidewalks. The annual average daily traffic (AADT) of Komohana Street in the vicinity of the intersection with Nowelo Street is about 17,800 cars as documented by previously completed traffic analysis reports[1] for projects within one-half mile of the UHH HLB project site. Daily traffic volumes were not available from HDOT for any count stations located nearby.

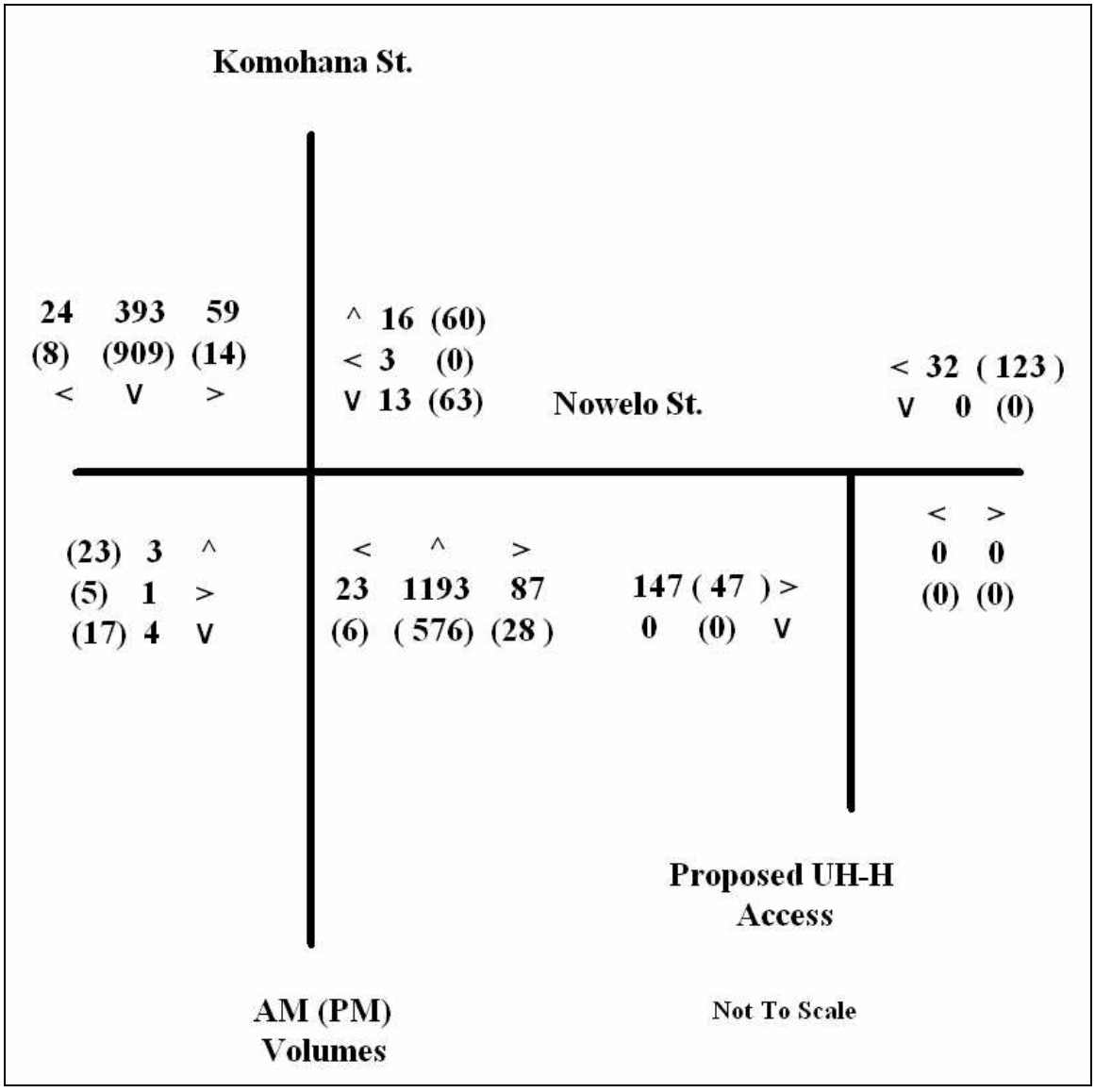
The intersection of Komohana Street at Nowelo Street is controlled by an actuated traffic signal and a copy of the traffic signal plan and timing information is provided in appendix E. The signal operates as an independent signal for the weekend and the entire weekday except for the time period from 7:10 A.M. to 8:00 A.M. During that time period, the signal joins the coordinated system along Komohana Street with a cycle length that is double the system cycle of 127 seconds, so it operates during the 7:10 A.M. to 8:00 A.M. period on a 254 second cycle. Therefore, it is afforded progression every other cycle. Hawaii County Public Works staff indicates this arrangement has greatly improved traffic flow at the morning peak hour. The signal has a single phase for the Nowelo Street approaches and left turn phases in each direction for the Komohana Street approaches.

[1] Referenced traffic impact studies include:
- UH-Hilo Student Life Center (Draft), July 2005
- US – China Center at UH-Hilo, Rowell, September 2001
- Mauna Kea Astronomy Education Center, M&E Pacific, July 2002

B. Traffic Volumes

A traffic turning movement count was made at the intersection of Komohana Street at Nowelo Street on August 7, 2007. The traffic count data is found in appendix A. Traffic volumes on Nowelo Street at the project site were estimated by adding the eastbound through and northbound right and southbound left turns from the Komohana Street at Nowelo Street counts to derive the eastbound through movement at the site. The westbound through movement was taken to be the total of the approach traffic on the westbound approach at the signal at Komohana Street at Nowelo Street. There will be some traffic added between the site and Komohana Street and some traffic exiting to the east via Nowelo Street. The method used gives a reasonable estimate. In actuality volumes would likely be slightly lower than the estimate; however, we feel this estimate is adequate for Nowelo Street at the project site as currently most traffic entering the university use Kawili and Lanikaula Streets. The traffic volumes for the turning movements at the two intersections in the study area are shown in figure 3. These numbers represent the morning and afternoon peak hours of 7:00 A.M. to 8:00 A.M. and 4:00 P.M. to 5:00 P.M. Truck counts were not made at the Komohana Street at Nowelo Street intersection, but an estimate of 2 percent was assumed for all movements at both the intersections. Pedestrian counts were not made due to the very low level of pedestrian activity at the study intersections and the expectation that the proposed development would not create significant volumes of pedestrian traffic.

Figure 3
Existing Traffic Volumes for A.M. and P.M. Peak Hours



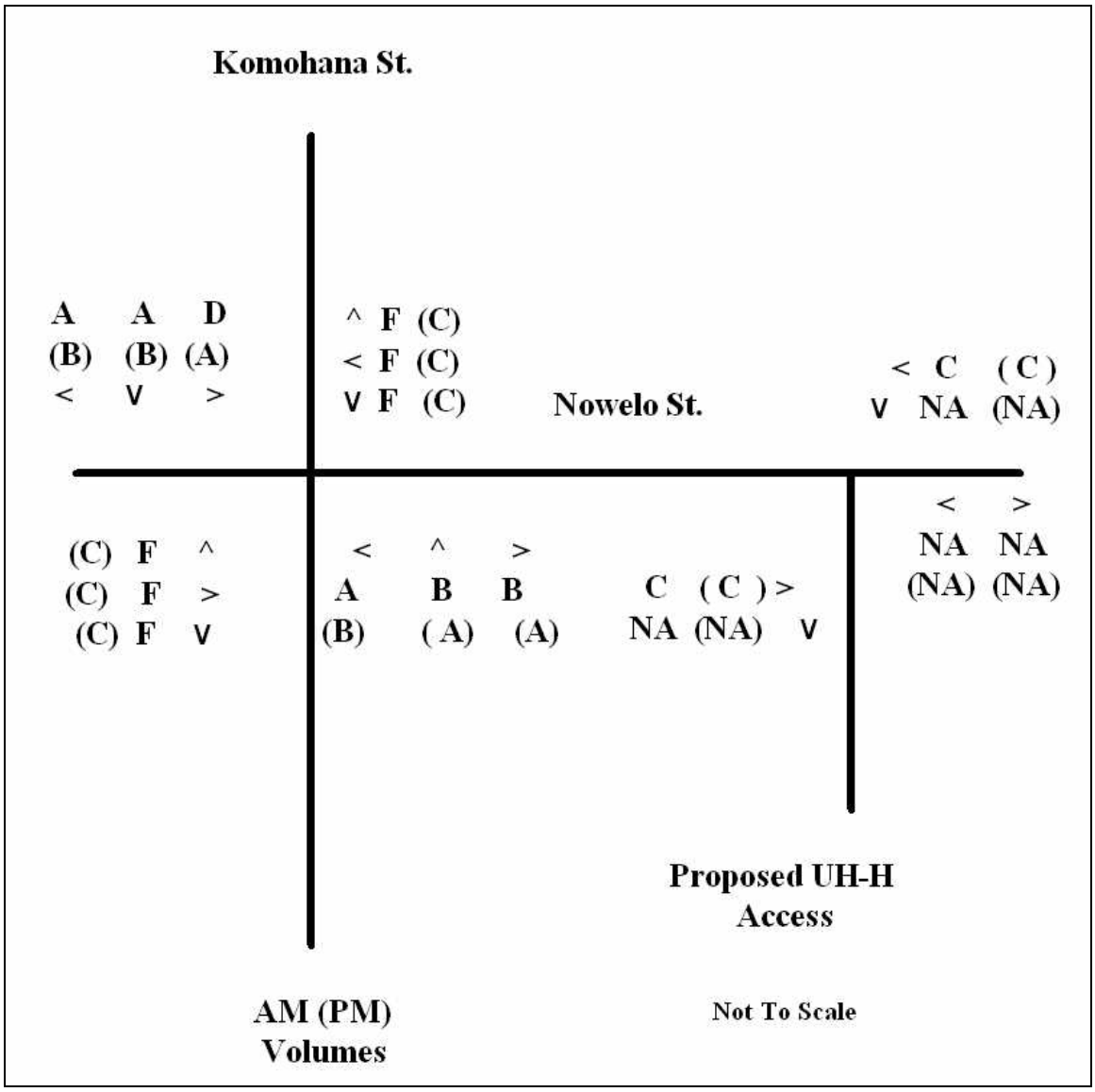
The peak hour factors for each movement along with estimated truck percentages are available in appendix E. The HCM was used to assess the congestion and LOS of the study intersections for the existing conditions using the Synchro software and its SimTraffic simulation module. The results of the Synchro/HCM analysis are given below in table 3 and figure 4. The printouts from Synchro and SimTraffic for the existing conditions analysis are provided in appendix E.

Table 3
LOS and Other Measures for Existing Conditions for A.M. and P.M. Peak Hours

Intersection	Movement	A.M. Peak Hour				P.M. Peak Hour			
		Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)	Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)
Komohana St. at Nowelo St.	Northbound Left turn	1.7	.05	A	31	10.4	.07	B	
	Northbound Thru/Right	17.7	.90	B	444	8.7	.61	A	246
	Southbound Left turn	44.4	.44	D	31	5.3	.06	A	26
	Southbound Thru/Right	2.2	.28	A	109	14.3	.83	B	173
	Eastbound Left/Thru	119.1	19.1	F	32	31.8	.43	C	30
	Eastbound Right	118.0	.12	F	30	29.3	.15	C	52
	Westbound Left/Thru	125.3	.50	F	70	32.8	.51	C	54
	Westbound Right	121.8	.36	F	32	31.2	.39	C	31
	Total	19.0	.86	B	NA	14.9	.76	B	NA
Nowelo St. at Proposed UH-H Site Access	Eastbound Thru/Right	NA	NA	NA	NA	NA	NA	NA	NA
	Westbound Thru/Right	NA	NA	NA	NA	NA	NA	NA	NA
	Site Driveway Exit onto Nowelo St.	NA	NA	NA	NA	NA	NA	NA	NA
	Total	NA	NA	NA	NA	NA	NA	NA	NA
Nowelo St. from Komohana St. to New UH-H Access	Eastbound	NA	.05	C	NA	NA	.07	C	NA
	Westbound	NA	.22	C	NA	NA	.19	C	NA

NA = Not applicable

Figure 4
Levels of Service for Existing Conditions for A.M and P.M. Peak Hours



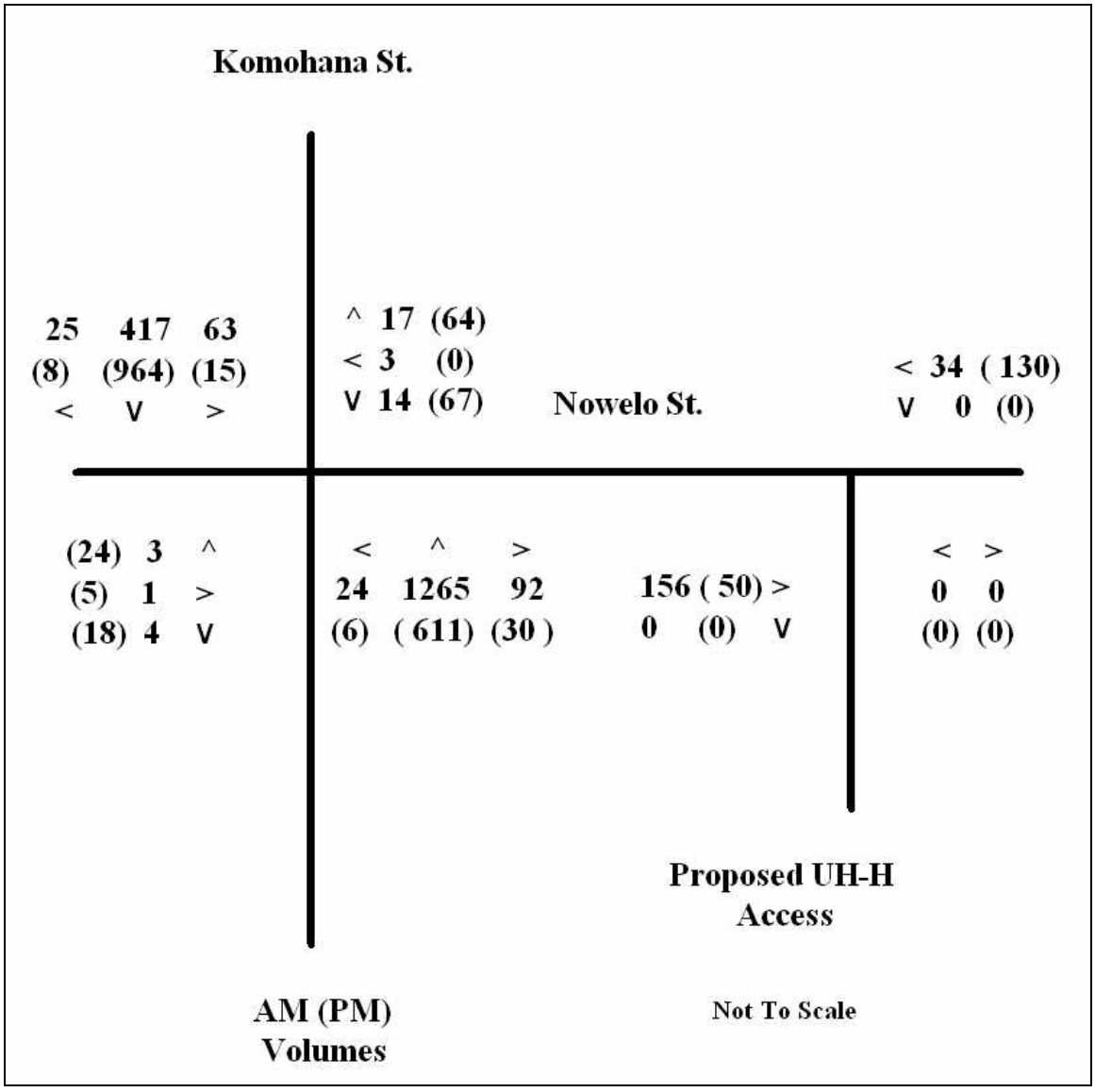
IV. TRAFFIC FORECASTS

A. Background Traffic Forecast

As mentioned above in section III, daily traffic volumes were not available from HDOT for any count stations located nearby. A review was made of traffic growth factors contained in several other traffic impact studies for projects located within one-half mile of the UHH HLB made by others over the last five years. In reviewing these studies, it was determined that the background growth rate is about two percent per year on Komohana Street.

The two percent annual growth factor was applied to the existing morning and afternoon peak hour volumes from figure 3 to give the future traffic volumes in the buildout year of 2010 as seen in figure 5. See appendix D for additional information.

Figure 5
Future Year 2010 Peak Hour Traffic Volumes without the UHH HLB Project



B. Project Generated Traffic

The prediction of project generated traffic was made using the guidelines of the ITE in its publications "Trip Generation, 7th Edition" and the "Trip Generation Handbook." However, this facility is unique in that it has college students in a university setting as well as younger children who will make use of the facility. For that reason, using the standard ITE rates may not be accurate. In looking at the facility as part of a college campus, ITE would suggest basing trip generation estimation on the number of students or the number of faculty and staff. This becomes a challenge since so many visitors to the site will not be students but will be bringing children to the facility for classes and performances. Since the facility is not totally a school for children, the ITE (or other source) rates for elementary or higher schools would also not apply. There will be numerous students who attend classes at the UH-H campus and either live on campus or would simply walk to the facility from other parts of campus. So, developing a predicted trip generation is difficult.

Because the facility will provide about 70 parking spaces, that information was used as a guide. The capacity of the lot could not in theory be exceeded, the total traffic into and out of the lot and its one single point of access would need to compare closely to the 70 maximum figure. It is highly unlikely that the entire lot would fill for the entire A.M. or P.M. peak hour and then empty with no new arrivals. There will also be some short term parkers who may be visitors or have short visits to conduct business of some sort at the facility. There will be some delivery trucks on a routine basis such as the US Postal Service and other commercial delivery companies, as well as sanitation and campus police vehicles. There will be some level of turnover, as yet fully unknown, within the facility parking lot.

Predicting trip generation for university facilities is difficult because so much depends upon whether there are commuters or on-campus housing. The ITE average rate is about 0.21 trips per student in the A.M. peak with 80:20 entering:exiting and about the same rate in the P.M. peak hour with a 30:70 enter:exit ratio. As described in section I, The information provided in the facility design notes suggest upwards of 172 students. That would then imply only 35 trips into and out of the site at the peak hour. That would be low, given the number of parking spaces shown (about 70 or so, depending upon handicap requirements and final design matters). The facility design notes indicate 47 faculty and staff with 30 teachers. That is a very low student to teacher ratio of just 172:30 or 5.6:1. Moreover, this facility does not appear to be typical of most college learning facilities. The classroom and other space shown in the site plan would probably get a loading of about 150 if all the classrooms and meetings were full plus the administrative area of an estimated 25 for a total of about 175.

It can be assumed that all of the faculty will arrive in the same A.M. and P.M. peak hours for a total of 47 each peak hour (assume all drive and no car pools). A certain number of

deliveries (daily and peak hours) can be assumed. It can also be assumed that some number of visitors and/or students will drive to the facility for whatever reason. Class schedules vary and not all students would arrive in the same A.M. peak hour anyway. But again, the upset figure appears to be the number of parking stalls. Since this is such a specialty facility, it would be best to estimate the trips by using the maximum number of parking stalls and taking the total volume entering and leaving to be the grand total of:

1. Assume all faculty and staff arrive in the same A.M. peak hour (**47**)
2. Assume 25 percent of students drive and park or attempt to do so in the same peak hour (25 percent of 172 = **43**)
3. Assume a worst case of 5 deliveries in the A.M. peak hour (**5**)
4. Assume a worst case of 3 special event buses bringing children for classes or performances (**3**)
5. Assume a worst case of 10 unexpected visitors (parents, vendors, etc.) (**10**)
6. This gives a grand total of **108** in the A.M. peak hour
7. Assume the 80:20 enter:exit ratio from ITE to get **86** entry and **22** exits for the A.M. peak hour.
8. Assume the same 108 for the P.M. peak hour with the 30-70 entry-exit ratio from ITE to get **32** entry and **76** exits.
9. This translates to 108:175 or 0.62 trips per student in each peak hour. That is 3 times the national average for college campus facilities, per ITE, but within 2 standard deviations of the mean. It would imply some turnover of spaces by the deliveries and some of the visitors and students. It would also allow for some average rate of absenteeism by faculty and staff in meeting the parking requirements.

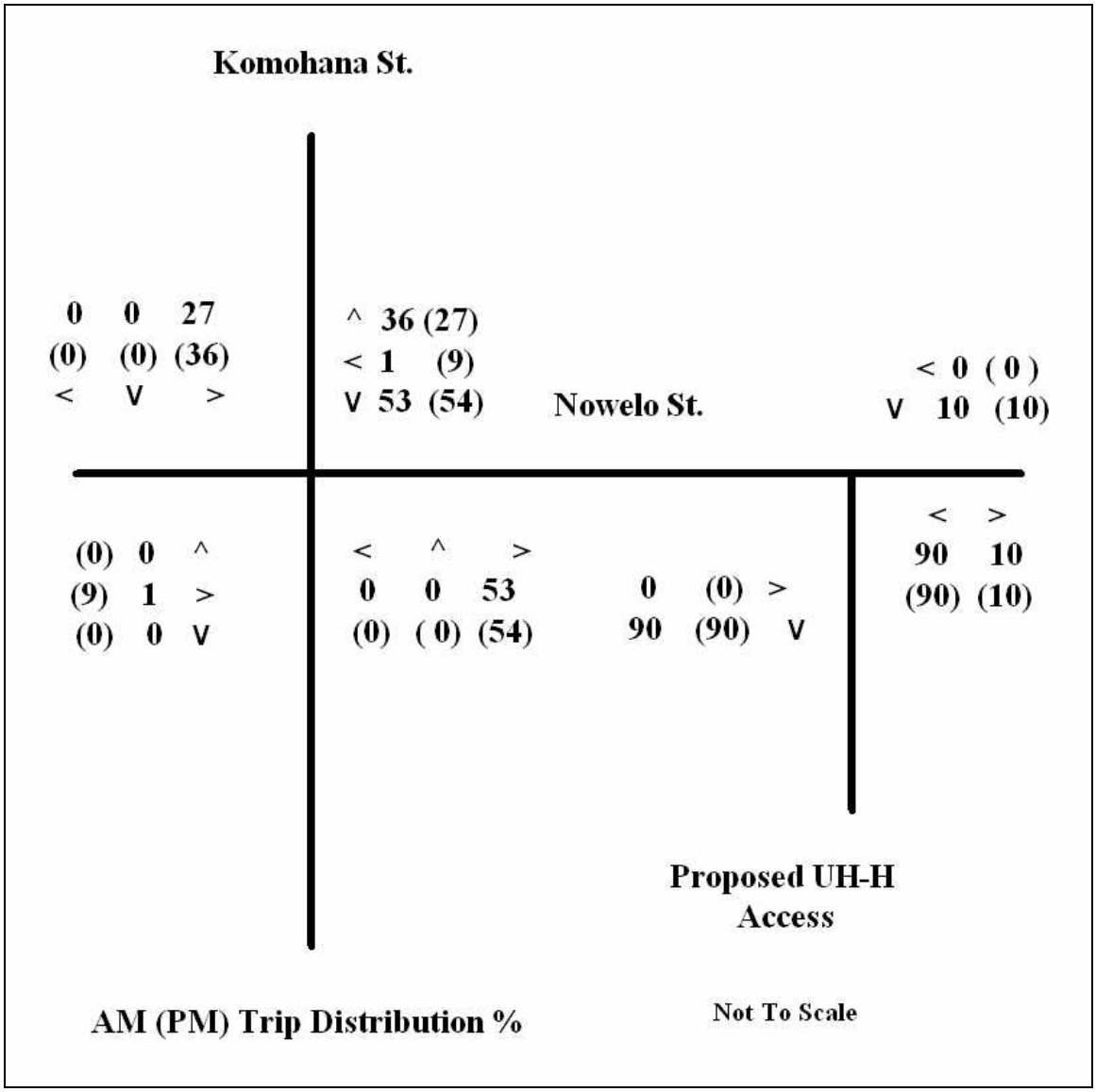
The new trips indicated in table 4 for the morning and afternoon peak hours were used as part of the input to the Wintass program to develop assignments to the traffic network. The Wintass program requires trip distribution percentages of total traffic. For this project, it was assumed that the trip distribution matched the current distribution of traffic in the study network for the A.M. and P.M. peak periods. To derive this distribution a review was made of traffic volumes approaching the site from Nowelo Street and Komohana Street. Based on a review of the existing traffic volumes, the distribution of trips is predicted as indicated in figure 6.

Table 4
Trip Generation Summary for UHH HLB Project

Time Period	Total Trips	Percent Entry	Percent Exit	Number Entry	Number Exit
A.M. Peak Hour	108	80%	20%	86	22
P.M. Peak Hour	108	30%	70%	32	76
Daily Total Based on School	1224	50%	50%	612	612
Daily Total Based on College	400	50%	50%	200	200
Estimated Daily Total *	812	50%	50%	406	406

* Average of daily totals based on school and college

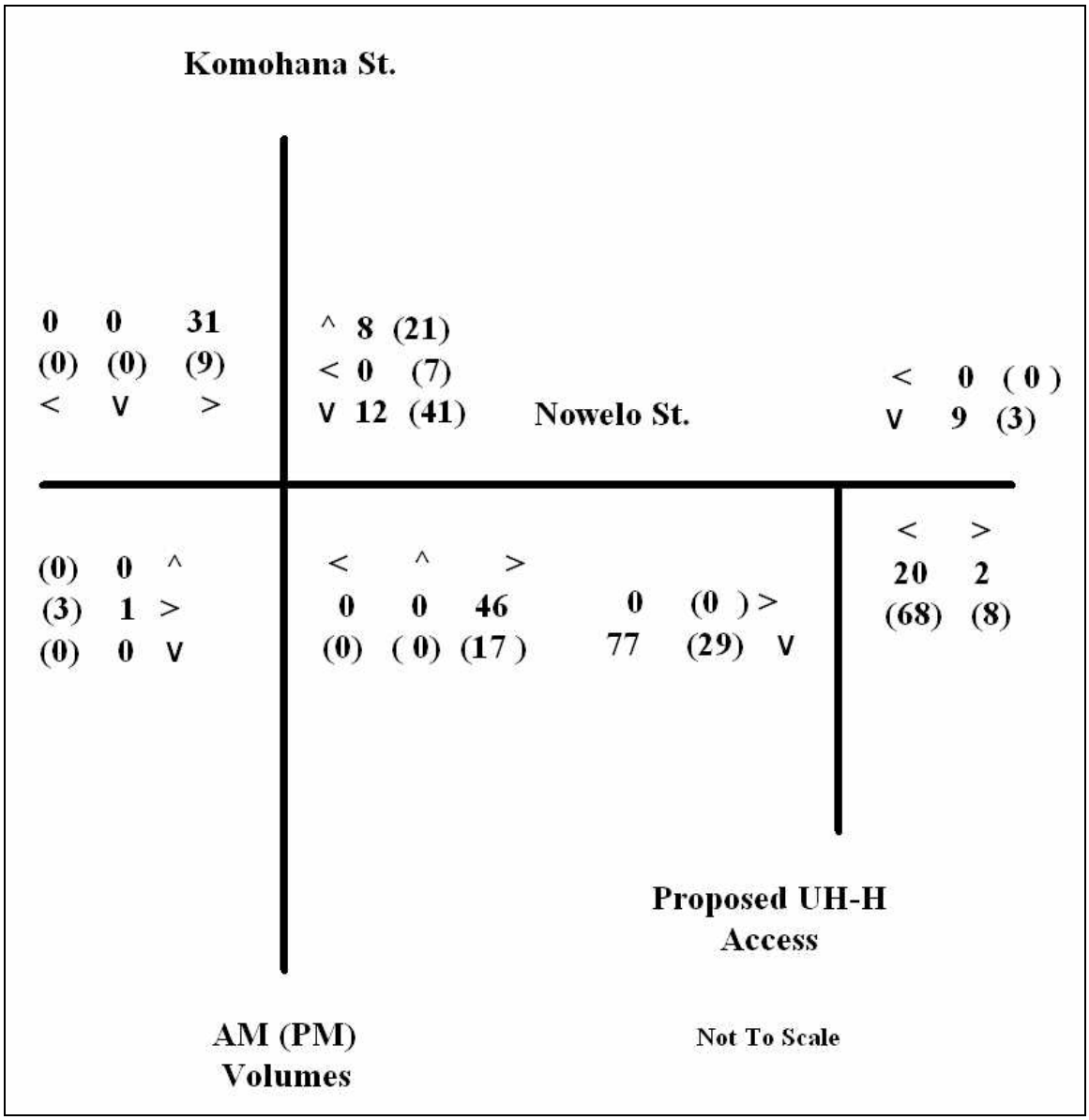
Figure 6
Trip Distribution for A.M. and P.M. Peak Hours



C. Traffic Added or Diverted in Street Network

Using the Wintass program with the trip generation data from table 4 and the trip distribution data from figure 6, the added trips to the street network are as shown in figure 7.

Figure 7
Added Volumes at Full Buildout in A.M. and P.M. Peak Hours



D. Traffic Volumes with Project in Place in 2010

Using the existing 2007 volumes and adding the background growth and new trips generated by the project at full buildout, the predicted traffic volumes are as shown in figures 8 and 9 for the No Build and Buildout scenarios for the year 2010.

Figure 8
Future 2010 Traffic Volumes for A.M. and P.M. Peak Hours for No Build Scenario

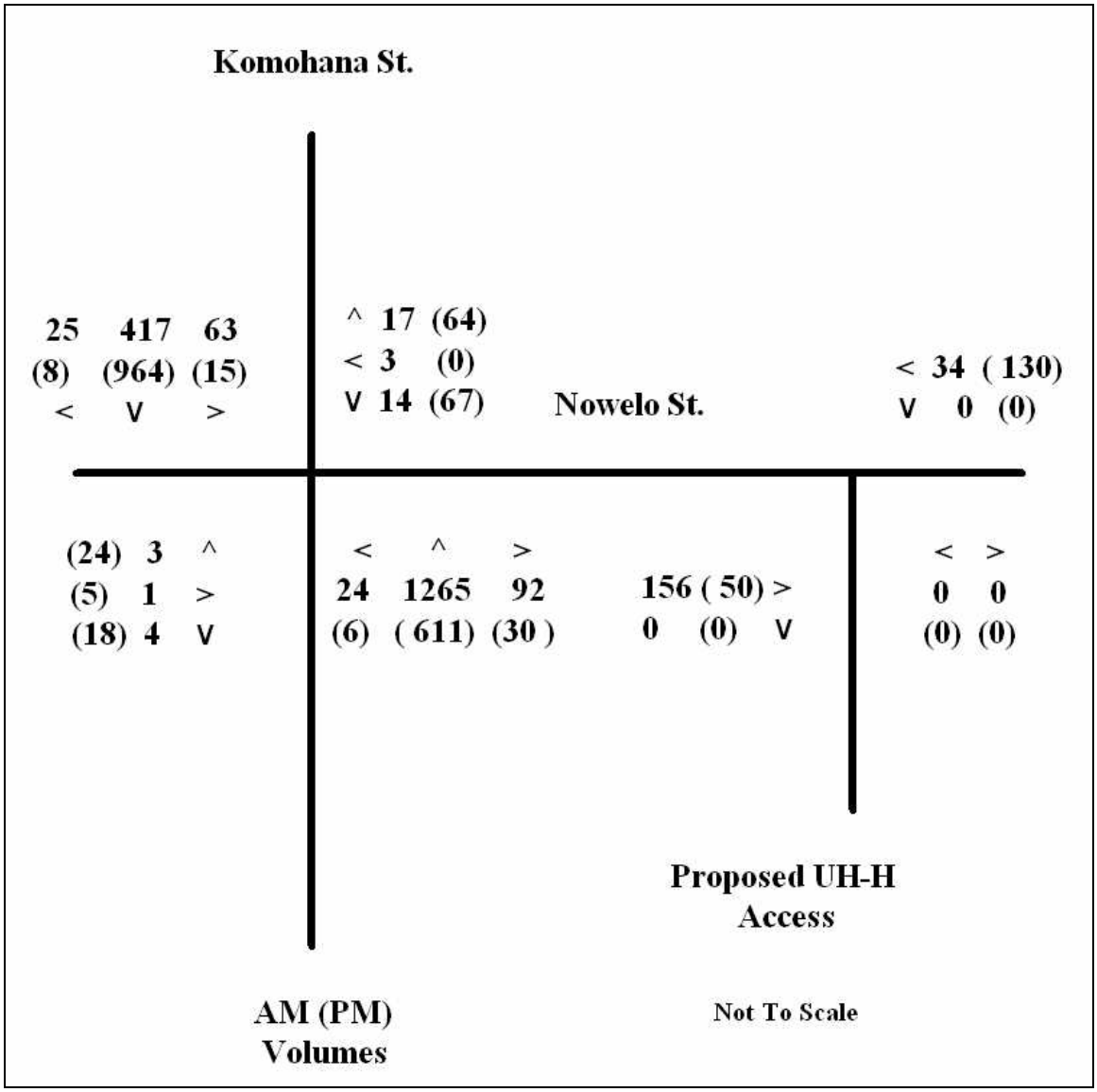
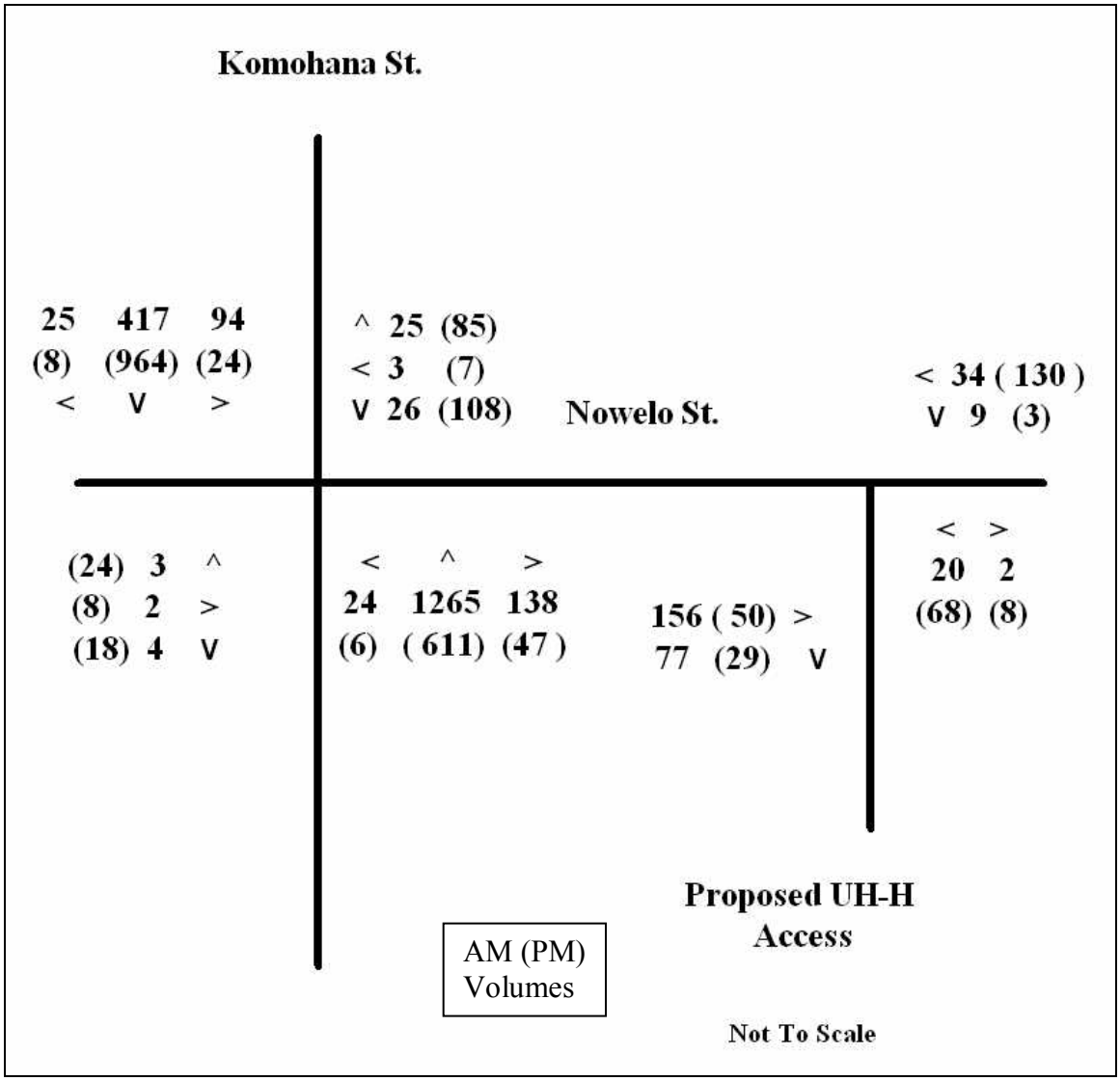


Figure 9
Future 2010 Traffic Volumes at Full Buildout for A.M. and P.M. Peak Hours



V. ANALYSIS OF FUTURE CONDITIONS

A. Level of Service Analysis

The results for No Build scenario for the year 2010 are shown in table 5.

Table 5
LOS and Other Measures for Future 2010 No Build Scenario for A.M. and P.M. Peak Hours

Intersection	Movement	A.M. Peak Hour				P.M. Peak Hour			
		Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)	Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)
Komohana St. at Nowelo St.	Northbound Left turn	1.8	.05	A	31	13.2	.09	B	31
	Northbound Thru/Right	27.9	.96	C	558	9.5	.65	A	129
	Southbound Left turn	118.4	.75	F	52	5.9	.07	A	26
	Southbound Thru/Right	2.4	.29	A	109	18.1	.88	B	754
	Eastbound Left/Thru	118.7	.19	F	32	31.9	.44	C	50
	Eastbound Right	117.7	.12	F	30	29.3	.15	C	32
	Westbound Left/Thru	126.7	.52	F	70	33.3	.53	C	32
	Westbound Right	121.5	.37	F	32	31.3	.40	C	49
	Total	29.2	.93	C	NA	17.1	.81	B	NA
Nowelo St. at Proposed UH-H Site Access	Eastbound Thru/Right	NA	NA	NA	NA	NA	NA	NA	NA
	Westbound Thru/Right	NA	NA	NA	NA	NA	NA	NA	NA
	Site Driveway Exit onto Nowelo St.	NA	NA	NA	NA	NA	NA	NA	NA
	Total ICU*	NA	NA	NA	NA	NA	NA	NA	NA
Nowelo St. from Komohana St. to New UH-H Access	Eastbound	NA	.24	C*	NA	NA	.05	C*	NA
	Westbound	NA	.08	C*	NA	NA	.20	C*	NA

* LOS is derived from the V/C ratio for directional volume on Nowelo Street, per table on page 6.

Table 5 shows the continued growth in traffic, regardless of the future UHH Hawaiian Language Building, will have the effect of increasing congestion and delay and reducing levels of service in the study network only slightly. As shown in table 5, the LOS for the eastbound traffic on Nowelo Street at Komohana Street. is expected to decline to F by the year 2010. However, there is a very low volume of traffic on both the eastbound and westbound approaches. The long cycle length coupled with the low percentage of green time accounts for the predicted delay and LOS for these two movements. In addition, the left turn southbound from Komohana Street onto Nowelo Street is predicted to have a LOS F.

Again, the signal timing is the primary factor, as the volume of left turns is predicted to continue to be low. The County of Hawaii may wish to consider signal timing changes to improve these LOS in the future. However, any changes in signal timing to better serve the side street and the southbound left turn will cause greater delays and a decline in LOS for the mainline on Komohana Street which carries a large volume of traffic. The LOS shown for the section of Nowelo Street between Komohana Street and the proposed UHH HLB access was assessed and assigned a LOS based on the method discussed in this report in section II.

As noted in table 5, this definition of LOS is for segments of street and is based on the volume to capacity ratio. As shown, this LOS is expected to remain at C, which is considered acceptable.

The street network was then analyzed for the year 2010 with the predicted traffic volumes from figure 9 for the buildout scenario. This scenario would include background growth and the construction of the new UHH Hawaiian Language Building. The Synchro outputs are included in appendix E. A summary of the results of the HCM analysis is given in table 6.

As indicated earlier, a background growth factor was applied to all turning movement counts in the amount of 2 percent per year at a straight-line for a total increase of 6 percent between 2007 and 2010. The traffic volumes predicted to be generated by the new UHH HLB were then added to the existing and background growth to arrive at the predicted volumes in 2010 with the project built out and occupied.

As shown in figure 6, the LOS shown is from the HCM methods for signalized and non-signalized intersections. In addition, the analysis method for the segment between Komohana Street and Nowelo Street discussed for the no build scenario was also used.

Table 6
LOS and Other Measures for Future 2010 Buildout Scenario for A.M. and P.M Peak Hours

Intersection	Movement	A.M. Peak Hour				P.M. Peak Hour			
		Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)	Delay (Sec.)	v/c Ratio	LOS	Max Queue (ft.)
Komohana St. at Nowelo St.	Northbound Left turn	2.4	.05	A	32	18.2	.10	B	31
	Northbound Thru/Right	52.6	1.04	D	1500	15.5	.75	B	186
	Southbound Left turn	345.5	1.39	F	69	9.5	.15	A	26
	Southbound Thru/Right	3.2	.30	A	93	30.7	.95	C	274
	Eastbound Left/Thru	113.7	.16	F	31	29.5	.45	C	32
	Eastbound Right	112.7	.08	F	0	26.1	.12	C	53
	Westbound Left/Thru	124.9	.58	F	108	42.1	.76	D	90
	Westbound Right	116.9	.38	F	29	28.6	.40	C	111
	Total	63.0	1.33	E	NA	26.0	.90	B	NA
Nowelo St. at Proposed UH-H Site Access	Eastbound Thru/Right	0.0	.22	NA	NA	0	.07	NA	NA
	Westbound Thru/Right	.01	1.2	A	NA	.1	0	A	NA
	Site Driveway Exit onto Nowelo St.	11.3	.04	B	31	11.1	.12	B	42
	Total ICU*	.306	.7	A	NA	2.2	.240	A	NA
Nowelo St. from Komohana St. to New UH-H Access	Eastbound	NA	.35	C	NA	NA	.12	C	NA
	Westbound	NA	.08	C	NA	NA	.30	C	NA

* LOS is derived from the V/C ratio for directional volume on Nowelo St. as per table on page 6.

As indicated above in table 6, it is predicted that there will continue to be significant congestion and delay problems with the full buildout of the project for the A.M. peak hour for the eastbound and westbound movements on Nowelo Street at Komohana Street and for the southbound left turn movement from Komohana Street onto Nowelo Street. This is largely attributable to the long cycle and the low percentage of green time given to these movements. It may be possible for the County of Hawaii to revise the signal timing

to provide more green time and improve the LOS of these movements. However, addition of green time to these movements will of course be at the expense of the green time for the mainline through movements northbound and southbound on Komohana Street.

B. Road Design Considerations

In addition to the analysis using LOS and delay criteria, a review was also made of design considerations for the two intersections that may not necessarily be evident in looking only at HCM analysis made through Synchro. The issue of the need to improve the intersection of Komohana Street at Nowelo Street by adding a right turn lane was reviewed. Criteria for the addition of right turn lanes at signalized intersections are generally not available from AASHTO, but some have been adopted by some state DOT's. A report published in the ITE Journal (see appendix F) gives guidelines for treatment of right turns at signalized intersections and provides a graph for use in determining the appropriate treatment.

Using these guidelines results in the application of the graph as shown in figure 10. However, since the graph ends at 1,000 vehicles per hour for the mainline movement, there is some question as to the applicability of this method for volumes over 1,000. It would presume that approaches with total combined volumes greater than 1,000 would have needs greater than those less than 1,000 per hour.

As seen in figure 10, a right turn lane should be considered on the northbound approach of the Komohana Street/Nowelo Street intersection, with the proposed UHH Hawaiian Language Building in place. The graph is very close in the scenario of future growth without the project in place.

Based on the large volume of existing traffic in the A.M. peak hour, it would appear that a right turn lane would be beneficial with or without the project. A Synchro run made to assess the addition of a right turn lane without the project in place shows considerable improvement with a right turn added for the northbound movement in the A.M. peak hour.

The AASHTO criteria for addition of a left turn lane on an existing two-lane road with a speed of 40 mph are given in figure 11. This figure is used by entering the advancing volume and opposing volume and reading the required minimum percentage of left turns within the advancing volume. A separate chart for speeds matching the posted speed limit of 20 mph is not provided by AASHTO. However, use of this chart provides a conservative assessment of the need for a left turn lane. If the actual percentage of left turns exceeds this value, then a left turn lane is warranted. Figure 11 also shows the warrant criteria applied to predicted morning and afternoon peak hour data.

As seen in figure 11, the intersection of Nowelo Street at the proposed new access point does not meet the AASHTO criteria for addition of a left turn lane westbound on Nowelo Street. In addition, as seen in table 6, this movement is expected to have good levels of service for the morning and afternoon peak hours. So, it would appear that the addition of

the UHH Hawaiian Language Building access point would not require construction of a left turn lane, from the standpoint of predicted level of service.

A review was also made to determine whether a right turn lane is needed to accommodate the predicted volumes at the UHH Hawaiian Language Building access point. The criteria for addition of right turn lanes presented in the National Cooperative Highway Research Program Report Number 279 are generally accepted as a reasonable starting point. These criteria have been adopted and are used by many DOTs and other agencies. Figure 12 shows the application of the warrants for right turn lanes applied to the intersection of Nowelo Street at the UHH Hawaiian Language Building access point.

As seen in figure 12, the location would barely meet the warrant for the morning peak hour, but only for a taper and not a full right turn lane. It is impractical to build tapers in most cases and, since a full right turn lane is not warranted, it is not recommended based on this guideline.

Figure 10
ITE Report Criteria for Right Turn Lanes at Signalized Intersections Applied to the Intersection of Komohana Street at Nowelo Street

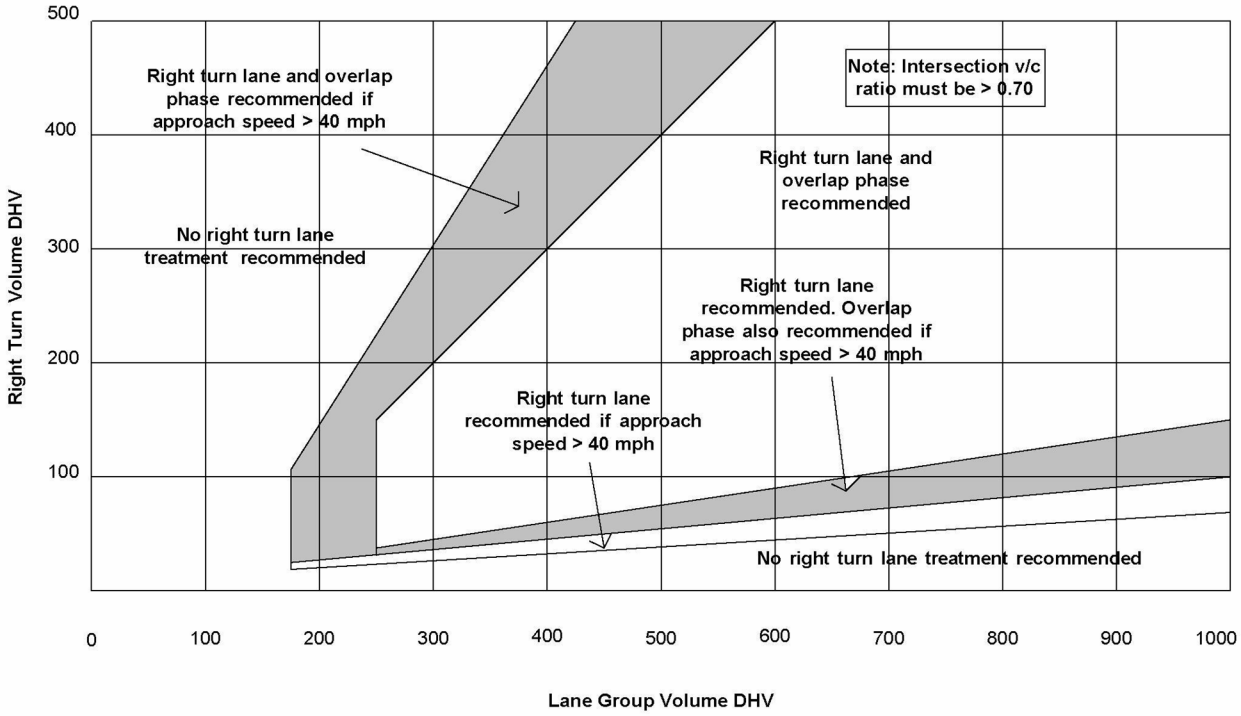


Figure 11
AASHTO Criteria for Left Turn Lanes Applied to Nowelo Street at the UHH Hawaiian Language Building Access Point

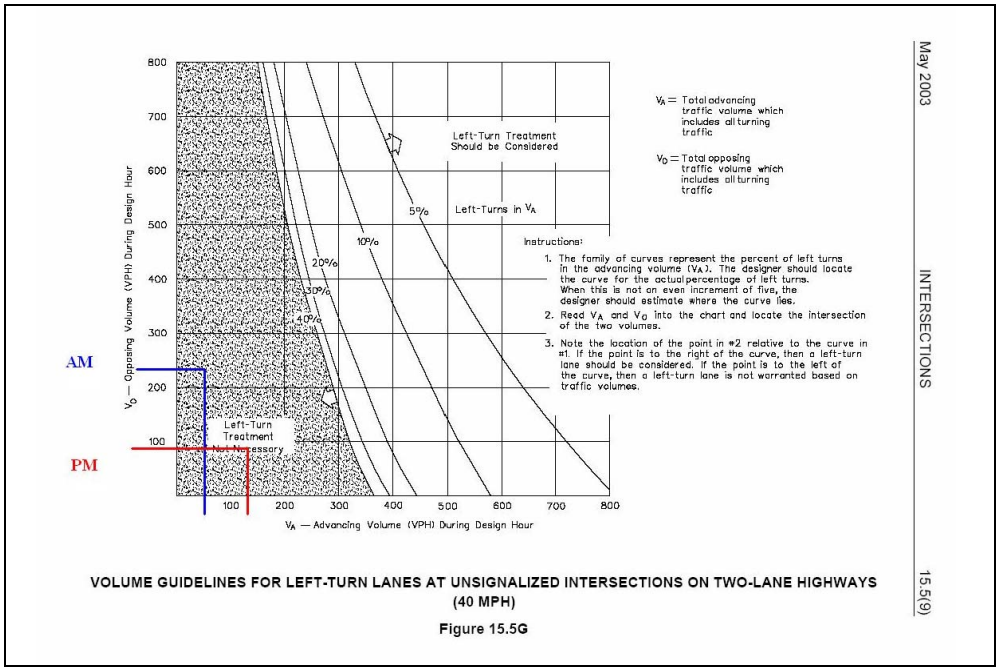
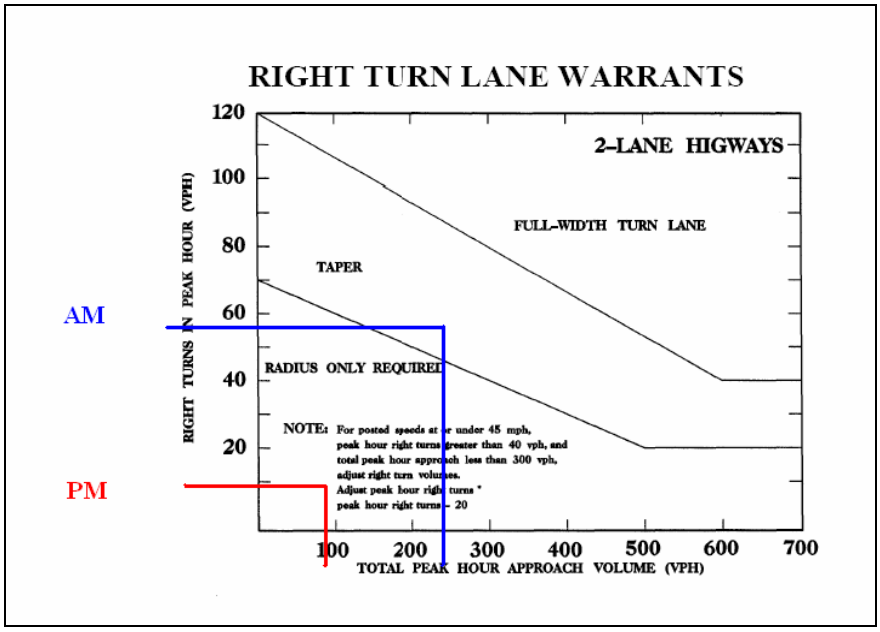


Figure 12
Criteria for Addition of a Right Turn Lane Applied to Nowelo Street at UHH Access Point



C. Conclusions

As a result of the analysis of the data collected and the predicted traffic conditions, the following conclusions are drawn:

1. The UHH HLB project will have a minimal overall impact on traffic operations on Komohana Street and Nowelo Street. The project should generate about 86 trips in the A.M. peak hour and about 32 trips in the P.M. peak hour. These volumes are dwarfed by the existing volumes on Komohana Street which total over 1,800 in the A.M. peak hour and over 1,600 in the P.M. peak hour.

2. The proposed UHH HLB project traffic can be handled adequately by a single two-lane driveway access with a single entry lane and a single exit lane. No turning lanes are necessary on Nowelo Street based on predicted traffic volumes. A driveway design with adequate turning radii will be needed, along with stop sign traffic control.

3. There is a marginal need for a right turn lane on the northbound approach of the intersection of Komohana Street at Nowelo Street as a result of this project. However, it is seen in the HCM analysis that a right turn lane would be very beneficial even without the proposed project.

D. Recommendations

The following recommendations are made for the full buildout of the project:

1. Provide a design for the proposed access to the UHH HLB which has one entry lane and one exit lane and adequate turning radii. The driveway should be designed to accommodate buses which will be expected to drop off and pick children attending classes and performances at the facility, as well as routine delivery trucks.

2. Provide a standard stop sign for control of exiting traffic from the proposed access point.

3. Discussions should be considered with the County of Hawai‘i to explore the possible addition of a right turn lane northbound on Komohana Street at Nowelo Street. A right turn lane would be beneficial to existing and future traffic with or without the proposed UHH HLB project.

4. The UHH may wish to contact the County of Hawai‘i at the appropriate time regarding the timing of the traffic signal at the intersection of Komohana Street at Nowelo Street. Slight adjustments may be necessary to accommodate additional traffic on the Nowelo Street approaches, as well as the southbound approach on Komohana Street.

VI. REFERENCES

American Association of State Highway and Transportation Officials. 2004. *AASHTO Green Book*: *A Policy on Geometric Design of Highways and Streets, 5th Edition.*

Institute of Transportation Engineers. 1995. *Guidelines for Right-Turn Treatments at Signalized Intersections.* Institute of Transportation Engineers Journal.

Institute of Transportation Engineers. 2003. *Trip Generation, 7th Edition*.

M &E Pacific, Inc. 2002. *Traffic Impact Analysis Report Mauna Kea Astronomy Education Center.*

National Cooperative Highway Research Program, Transportation Research Board, and AASHTO. *National Cooperative Highway Research Program Report 279: Intersection Channelization Design Guide*.

Phillip Rowell and Associates. 2001. *Traffic Impact Analysis Report US – China Center at UH-Hilo*.

Transportation Research Board. 2000. *Highway Capacity Manual*.

_____. 2005. *Draft Traffic Assessment Report UH-Hilo Student Life Center*.

Note to reader:

TIAR appendices available for review at SSFM International
Call (808) 933-2727 and speak to Heather Forrester to request .pdf file.

ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAIʻI AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 3

STATE HISTORIC PRESERVATION DIVISION
LETTER OF NO ADVERSE EFFECT

Cultural Surveys Hawai'i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

P.O. Box 1114 • Kailua, Hawaii 96734 • Ph.: (808) 262-9972 • Fax: (808) 262-4950

info@culturalsurveys.com • www.culturalsurveys.com

FAX TRANSMITTAL

To: Ron Terry Fax Number: 1 866-376 6988

Date: 3/21/2007

From: CS

Subject: UH Hilo Exp.

Remark: Copy of 8/9/94 SHPD IDLNR review LOR. per your request

Please call (808) 262-9972 if you do not receive 3 page(s) including this cover sheet or if transmission was received incomplete.

JOHN WAIHEE
GOVERNOR OF HAWAII

KEITH AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 9, 1994

Dr. Hallett Hammatt
Cultural Surveys Hawaii
733 North Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 12450
DOC NO: 9408RC05

Dear Dr. Hammatt:

SUBJECT: **Review of Archaeological Inventory Survey -- UH Hilo Research & Technology Lots**
Waiakea, South Hilo, Hawaii
TMK: 22-4-1:7, 19, 41

This review is of your revised report titled "Archaeological Survey and Testing of Lands Proposed for Research and Technology Lots at the University of Hawaii at Hilo" (Borthwick, Collins, Folk & Hammatt 1993. Cultural Surveys Hawaii ms.) and a survey of another 11 acres (Borthwick & Hammatt 1993. Supplemental Archaeological Survey and Testing of the Proposed University of Hawaii at Hilo Expansion Area. Cultural Surveys Hawaii ms.).

We find that the survey has covered the project area, finding 4 sites. The background review and site descriptions acceptably inventory these sites. Five features were test excavated. These sites were found to be two sugarcane field areas with associated walls and clearing mounds and two short-term use enclosures associated with these fields. No prehistoric or early historic Hawaiian sites were found, although one test unit found one volcanic glass fragment and a kukui nut in a layer predating the surface clearing mound (p. 6) and these represent a tiny remnant of natural or cultural use of the area prior to cane cultivation.

We agree with the significance evaluations for the sites, all being significant solely for their information content. Better examples of these sites exist in the nearby Pu'ainako Road extension project.

We also agree with the mitigation proposals for the four sites. No further work is needed, as a reasonable amount of information has been recorded.

We request only two changes to this report. Page 34 is missing and needs to be submitted. Page 22 describes Hunt's preliminary report, and those findings were discarded by Hunt when he did additional survey and archival work. We request that a replacement page 22 be sent to us with a footnote added at the base of the page which cites his inventory report (Hunt 1994) and notes that additional survey and archival findings showed all sites to be plantation era structures. This way a reader will not be confused by the inaccurate findings of the preliminary study. With the understanding that these pages will be sent, we find this report acceptable, and the historic preservation review process for this project is concluded.

Sincerely yours,

Don Hibbard, Administrator

RC: rn

c: V. Goldstein, Planning Department, County of Hawaii

ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAI`I AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 4

SCHEMATIC DESIGN FIGURES

COLLEGE OF HAWAIIAN LANGUAGE

UNIVERSITY OF HAWAI'I at HILO

HILO, HAWAI'I

Ka Haka ʻUla O Keʻelikōlani

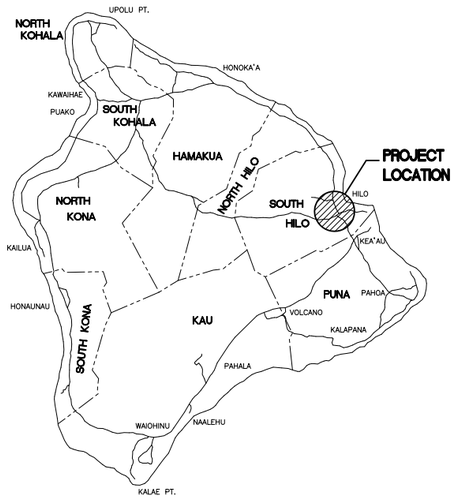
200 W. KAWILI STREET, HILO, HAWAI'I

TMK: (3) 2-4-001:007

OWNER:
UNIVERSITY OF HAWAI'I at HILO

UNIVERSITY OF HAWAI'I HILO

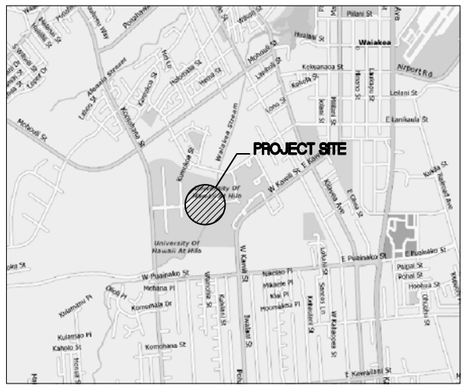
SCHEMATIC DESIGN SUBMITTAL



ISLAND OF HAWAII

NORTH

LOCATION MAP
NOT TO SCALE



NORTH

VICINITY MAP
NOT TO SCALE

PREPARED BY:

PRINCIPAL-IN-CHARGE	SSFM INTERNATIONAL, INC.
STRUCTURAL ENGINEER	SSFM INTERNATIONAL, INC.
CIVIL ENGINEER	SSFM INTERNATIONAL, INC.
PLANNING (EA)	GEOMETRICIANS ASSOCIATES
LEED CONSULTANT	GREEN BUILDING SERVICES
MECHANICAL ENGINEER	RANDOLPH H. MURAYAMA & ASSOCIATES, INC.
ELECTRICAL ENGINEER	HHMI CORPORATION
ACOUSTICAL ENGINEER	PMK CONSULTANT
GEOTECHNICAL ENGINEER	GEOLABS, INC.
ARCHITECTURAL AND INTERIOR DESIGN	KAUAHIKAUA & CHUN
LANDSCAPE ARCHITECT	BELT COLLINS
SURVEYOR	IMATA & ASSOCIATES, INC.
COST ESTIMATES	J. UNO & ASSOCIATES

APPROVED BY:

UNIVERSITY OF HAWAI'I
OFFICE OF CAPITAL IMPROVEMENTS — DATE

UNIVERSITY OF HAWAI'I
FACILITIES PLANNING AND CONSTRUCTION — DATE

JOB NO.	SHEET NO. OF	FILE NO.	DRAWING NO. T-1

2005_160.001 UH Hawaiian Language Building UH-Hilo

DRAWING NAME: I:\2005\2005_160.001 UH HAWAIIAN LANG BLDG DESIGN-UHH\G DRAWINGS\CONTRACT DOCUMENTS\CIVIL\01 T0.1 TITLE SHEET.DWG EDIT TIME: 08-20-07, 11:52 AM EDITED BY: HPEI

DRAWING INDEX

SHEET NO.	DWG NO.	DESCRIPTION
1	T-1	TITLE SHEET
2	T-2	DRAWING INDEX
3	C-1	SITE PLAN
4	L-1	SCHEMATIC LANDSCAPE PLAN
5	A-1	GARDEN LEVEL PLAN
6	A-2	ENTRY LEVEL PLAN
7	A-3	ROOF PLAN
8	A-4	NORTH AND WEST EXTERIOR ELEVATIONS
9	A-5	SOUTH AND EAST EXTERIOR ELEVATIONS
10	A-6	BUILDING SECTIONS
11	A-7	PRE-SCHOOL/DAY CARE PLAN
12	S-1	FOUNDATION AND GARDEN LEVEL PLAN
13	S-2	ENTRY LEVEL FRAMING PLAN
14	S-3	ROOF FRAMING PLAN
15	M-1	LOWER FLOOR MECHANICAL PLAN
16	M-2	SECOND FLOOR MECHANICAL PLAN

CODE INFORMATION
CHAPTER 5 BUILDING CODE (IBC 2003 EDITION)
CHAPTER 26 FIRE CODE (UFC 1988 EDITION)
CHAPTER 25 ZONING CODE

TMK: (3) 2-4-01:157
OWNER: STATE OF HAWAII
PROJECT ADDRESS: 200 W. KAWILI STREET, HILO, HAWAII
LOT AREA: 142.810 AC
LOT COVERAGE:
OCCUPANCY GROUP: BUSINESS GROUP B & ASSEMBLY GROUP A-3
USE: EDUCATION ABOVE 12TH GRADE, LECTURE HALL
CONSTRUCTION TYPE: II-B
NUMBER OF FLOORS: 2
FLOOR AREA: 38,777 S.F.
ZONING: UNIVERSITY USE
ZONING USE DESIGNATION: SCHOOL
STATE LAND USE DESIGNATION: URBAN
SPECIAL DESIGN DISTRICT: NONE
FLOOD ZONE: NONE
SHORELINE: NONE
SPECIAL MANAGEMENT AREA: NONE
REQUIRED PARKING:
SCOPE: TWO-STORY COLLEGE CLASSROOM AND OFFICE BUILDING
NATURE OF WORK: GRADING, PAVING, CONCRETE CONSTRUCTION, PLUMBING, VENTILATION, ELECTRICAL
SIDEWALK, CURB, AND DROP DRIVEWAY: YES
SEWAGE DISPOSAL: PUBLIC

NOTES:

1. THIS PROJECT SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM WITH THE ACCESSIBILITY REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
2. FIRE SAFETY DURING CONSTRUCTION, ALTERATION, OR DEMOLITION SHALL COMPLY WITH ARTICLE 87 OF THE 1988 UNIFORM FIRE CODE.

SIGNATURE EXPIRATION DATE OF THE LICENSE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

SSFM International, Inc.
101 Aupuni Street, Suite 315
Hilo, Hawaii 96720

REVISION	DATE	MADE BY	APPROVED

Ka Haka ʻUla O Keʻelikōlani
College of Hawaiian Language
University of Hawaii at Hilo
DRAWING INDEX AND PROJECT DATA

APPROVED BY:

DATE

DESIGNED BY:____
DRAWN BY:____
CHECKED BY:____
SURVEYED BY:____

FIGURE NO. T-2

DATE: XXX

SHEET NO. 2 OF X

2005_160.001 UH Hawaiian Language Building UH-Hilo

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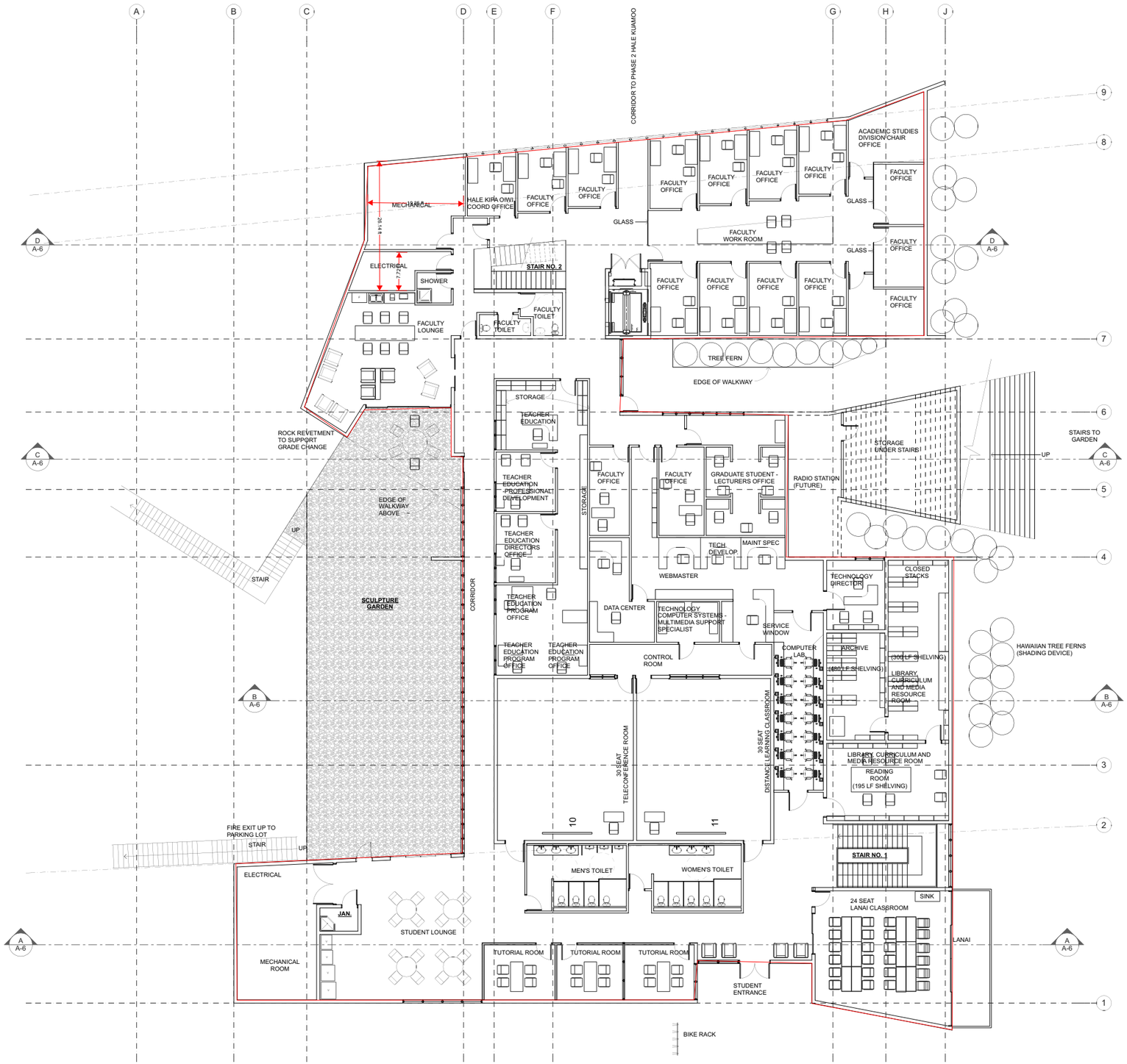

GARDEN LEVEL

SCALE : 1/8" = 1'-0"

Room Name **GARDEN LEVEL (ADMINISTRATION FACULTY WING)**	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
Academic Studies Division Chairperson	200	139	184
Faculty Office 1:	150	143	120
Faculty Office 2:	150	142	120
Faculty Office 3:	150	140	154
Faculty Office 4:	150	140	140
Faculty Office 5:	150	140	140
Faculty Office 6:	150	139	140
Faculty Office 7:	150	138	140
Faculty Office 8:	150	138	122
Faculty Office 9:	150	138	122
Faculty Office 10:	150	138	138
Faculty Office 11:	150	138	138
Faculty Office 12:	150	134	138
Faculty Office 13:	150	134	138
Faculty Workroom Copy Room	200	200	150
Hale Kipa Oiwi: Outreach Coordinator	150	0	122
Faculty-Staff Lounge Kitchen	750	460	749
Subtotal Net Area: Garden Level, Admin-Faculty Wing	**3250**	**2601**	**2771**
Subtotal Net:Gross Area: Garden Level, Admin-Faculty Wing*			2041
Subtotal Gross Area: Garden Level, Admin-Faculty Wing			**4812**
*Net:Gross Factor: Garden Level, Admin-Faculty Wing			74%

Other Rooms (Included in Net:Gross Area): Garden Level, Admin-Faculty Wing	
Mechanical Room (North)	338
Electric-Telephone Room (North)	130
Faculty Toilet	62
Faculty Toilet	45
Shower Room	42
	617

Room Name **GARDEN LEVEL (CLASSROOM WING)**	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
Graduate Student-Lecturer's Group Office	500	566	384
Faculty Office 14	150	132	142
Faculty Office 15	150	127	160
Teacher Education Program: Director's Office	200	141	168
Teacher Education Program: Program Office 1	150	141	
Teacher Education Program: Program Office 2	150	137	
Teacher Education Program: Program Office 3	150	131	335
Teacher Education Program: Storage & Supply Room	150	133	171
Teacher Education Program: Professional Development	150	139	144
Classroom 1.4 (Lanai Classroom)	600	337	674
Classroom 1.5 (Distance Learning Room)	700	869	878
Classroom 1.6 (Teleconference Room)	700	869	878
Student Lounge	500	500	645
Student Advisor's Office-Tutoring Room	500	440	490
Student Computer Lab	600	599	360
Library, Curriculum & Media Resource Room	1050	943	828
Archive	150	133	256
Technology Division: Administrators Office	200	223	154
Technology Division: Computer Sys. Support Specialist	400	420	423
Technology Division: Webmaster & Tech. Dev.-Maint. Spec.	300	542	304
Technology Division: Data Center	200	107	211
Subtotal Net Area: Garden Level, Classroom Wing	**7650**	**7629**	**7605**
Subtotal Net:Gross Area: Garden Level, Classroom Wing*			4969
Subtotal Gross Area: Garden Level, Classroom Wing			**12574**
*Net:Gross Factor: Garden Level, Classroom Wing			**65%**

Other Rooms (Included in Net:Gross Area): Garden Level, Classroom Wing	
Men's Toilet	260
Women's Toilet	293
Janitor	34
Mechanical Room (South)	471
	1058

AREA SUMMARY: GARDEN LEVEL	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
Total Net Area: Garden Level	**10900**	**10230**	**10376**
Net:Gross Area: Garden Level*	5450	9200	7010
Gross Area: Garden Level	**16350**	**19430**	**17386**
* Net:Gross Factor: Garden Level	50%	90%	68%

AREA SUMMARY: ENTIRE BUILDING (Entry Level, Garden Level, Porte Cochere, Covered Entry)	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
Grand Total Net Area: Entire Building	**17800**	**18432**	**18494**
Grand Total Net:Gross Area: Entire Building*	8900	18618	12827
Grand Total Gross Area: Entire Building	**26700**	**37050**	**31321**
* Net:Gross Factor: Entire Building	50%	101%	69%

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101 Aupuni Street, Suite 315
Hilo, Hawaii 96720

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DESCRIPTION | DATE | REVISION

Ka Haka ʻUla O Keʻelikōlani
College of Hawaiian Language
University of Hawai'i at Hilo

APPROVED BY:

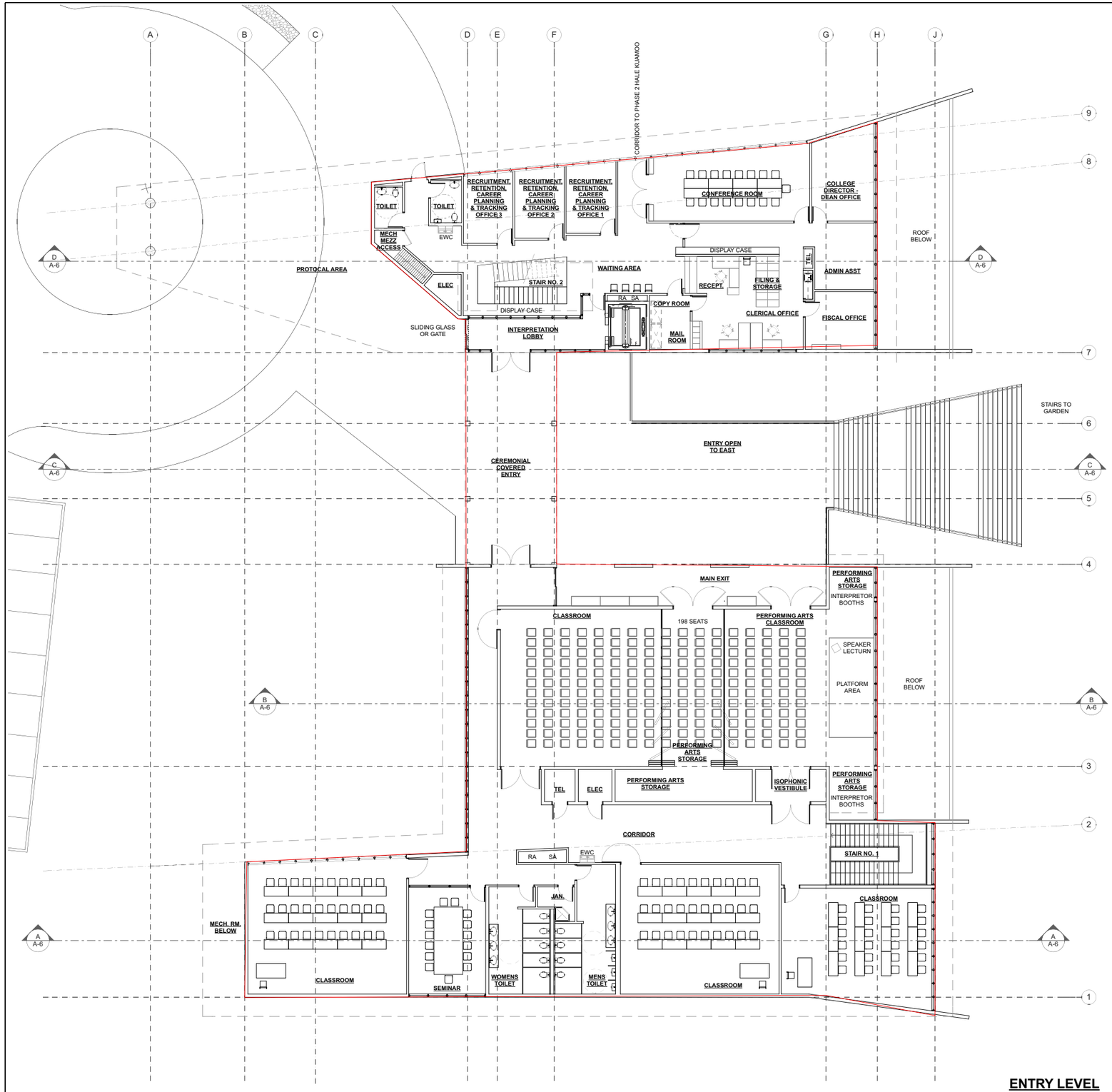
DATE

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SURVEYED BY:

FIGURE NO. **A-1r**
DATE: 21 SEPT 07

SHEET NO. OF

2005_160.001 UH Hawaiian Language Building UH-Hilo



ENTRY LEVEL

SCALE : 1/8" = 1'-0"

Room Name	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
ENTRY LEVEL (ADMINISTRATION-FACULTY WING)			
Director-Dean's Office	200	195	237
Administrative Assistant Office	150	147	168
Fiscal Office	150	125	168
College Reception-Mail	300	288	
College Clerical Office	450	349	
Work Room-Copy Room	300	138	
Filing & Storage	250	133	616
Recruitment, Retention, Career Planning & Tracking Office 1	150	138	147
Recruitment, Retention, Career Planning & Tracking Office 2	150	138	147
Recruitment, Retention, Career Planning & Tracking Office 3	150	138	148
Recruitment, Retention, Career Planning & Tracking Waiting	250	250	250
Conference Room (Teleconference)-Seminar Room	500	489	424
Subtotal Net Area: Entry Level, Admin-Faculty Wing	**3000**	**2528**	**2305**
Subtotal Net:Gross Area: Entry Level, Admin-Faculty Wing*			1713
Subtotal Gross Area: Entry Level, Admin-Faculty Wing			**4018**
* Net:Gross Factor (excl. Porte Cochere & Covered Entry) =			74%

Other Rooms (Included in Net:Gross Area): Entry Level, Administration-Faculty Wing	
Toilet	43
Toilet	54
Electric Room	43
Telephone Closet	8
	148

Room Name	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
ENTRY LEVEL (CLASSROOM WING)			
Seminar Room	400	378	356
Classroom 1.1	500	894	916
Classroom 1.2	500	724	891
Classroom 1.3	500	971	734
Performing Arts Classroom	600	1024	1023
Performing Arts Storage	700	594	796
40 Seat Classroom	700	1089	1097
Subtotal Net Area: Entry Level, Classroom Wing	**3900**	**5674**	**5813**
Subtotal Net:Gross Area: Entry Level, Classroom Wing*			2642
Subtotal Gross Area: Entry Level, Classroom Wing			**8455**
* Net:Gross Factor (excl. Porte Cochere & Covered Entry) =			45%

Other Rooms (Included in Net:Gross Area): Entry Level Classroom Wing	
Telephone Room	41
Electric Room	42
Men's Toilet	283
Women's Toilet	261
Janitor	44
	671

AREA SUMMARY: ENTRY LEVEL	Program (NSF)	PDR (NSF)	Schematic Des. (NSF)
Total Net Area: Entry Level	**6900**	**8202**	**8118**
Net:Gross Area: Entry Level*		9418	5817
Gross Area: Entry Level		**17620**	**13935**
* Net:Gross Factor (inc. Porte Cochere & Covered Entry) =		115%	72%

Other Rooms (Included in Net:Gross Area): Entry Level		
Porte Cochere-Protocol Area	1883	616
Covered Entry-Ceremonial Plaza Area	2142	846
	4025	1462

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SSFM International, Inc.
101 Aupuni Street, Suite 315
Hilo, Hawaii 96720

DESCRIPTION | BY/DATE | APPROVED

Ka Haka ʻUla O Keʻelikōlani
College of Hawaiian Language
University of Hawai'i at Hilo

APPROVED BY:

DATE

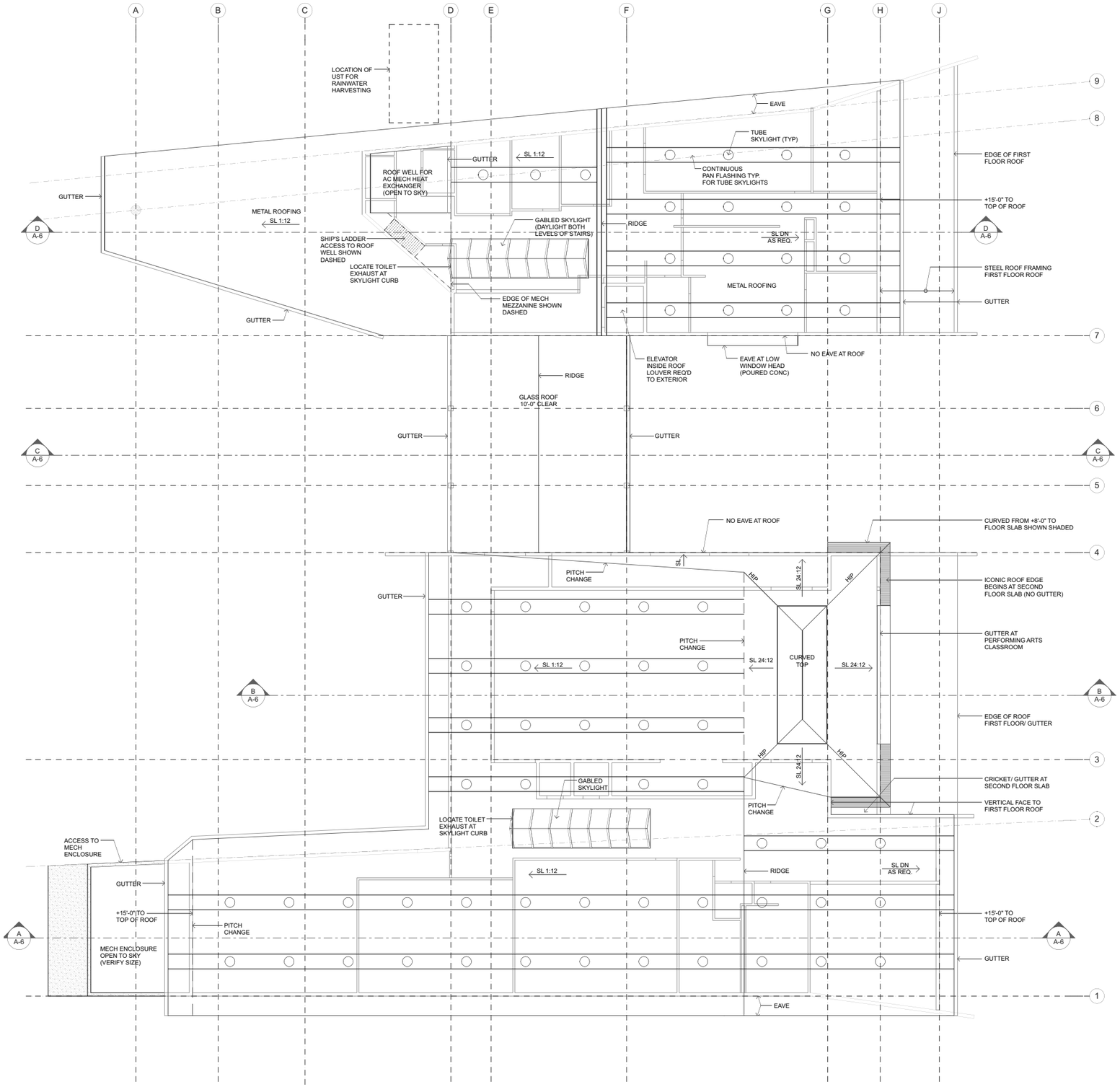
DESIGNED BY:
DRAWN BY:
CHECKED BY:
SURVEYED BY:

FIGURE NO. A-2r

DATE: 21 SEPT 07

SHEET NO. OF

2005_160.001 UH Hawaiian Language Building UH-Hilo



BASIS OF DESIGN FOR DAYLIGHTING

1. USE DAYLIGHT FROM GLASS CURTAIN WALL ENTERING ROOMS FROM SIDE WALLS. THIS MINIMIZES ROOF PENETRATIONS IN THIS RAINY HILO AREA.
2. USE DAYLIGHT ENTERING FROM GABLED SKYLIGHTS TO ILLUMINATE ADJACENT CIRCULATION SPACES SUCH AS STAIRS AND CORRIDORS.
3. USE TUBE SKYLIGHTS TO ILLUMINATE INTERIOR SPACE FARTHER AWAY FROM WINDOWS OR GABLED SKYLIGHTS.

ROOF PLAN

SCALE : 1/8" = 1'-0"

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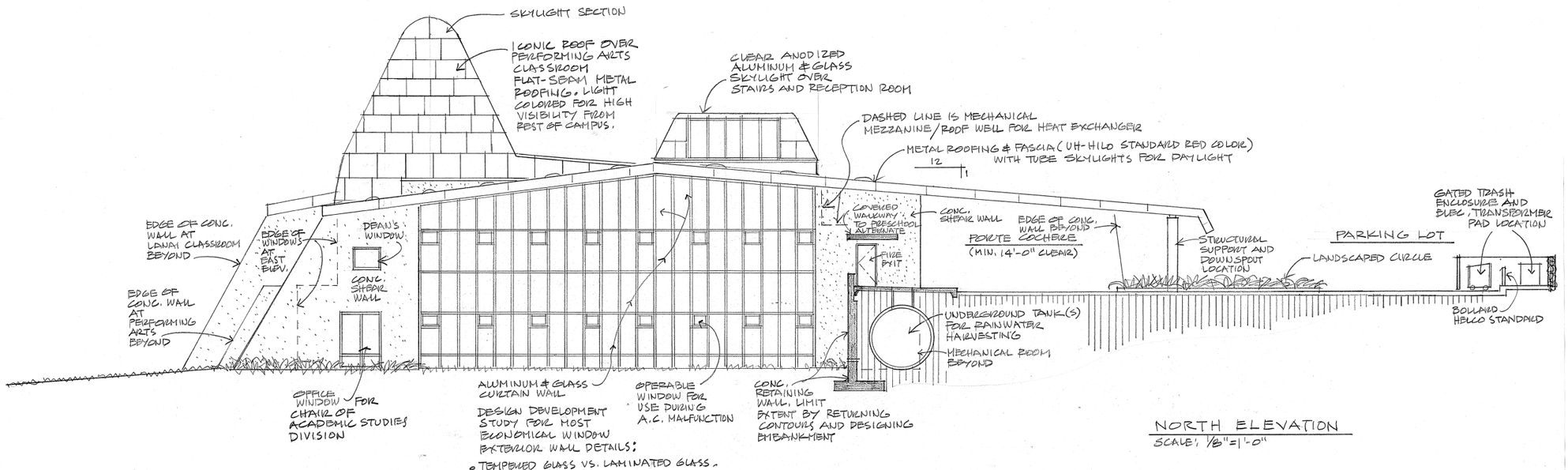

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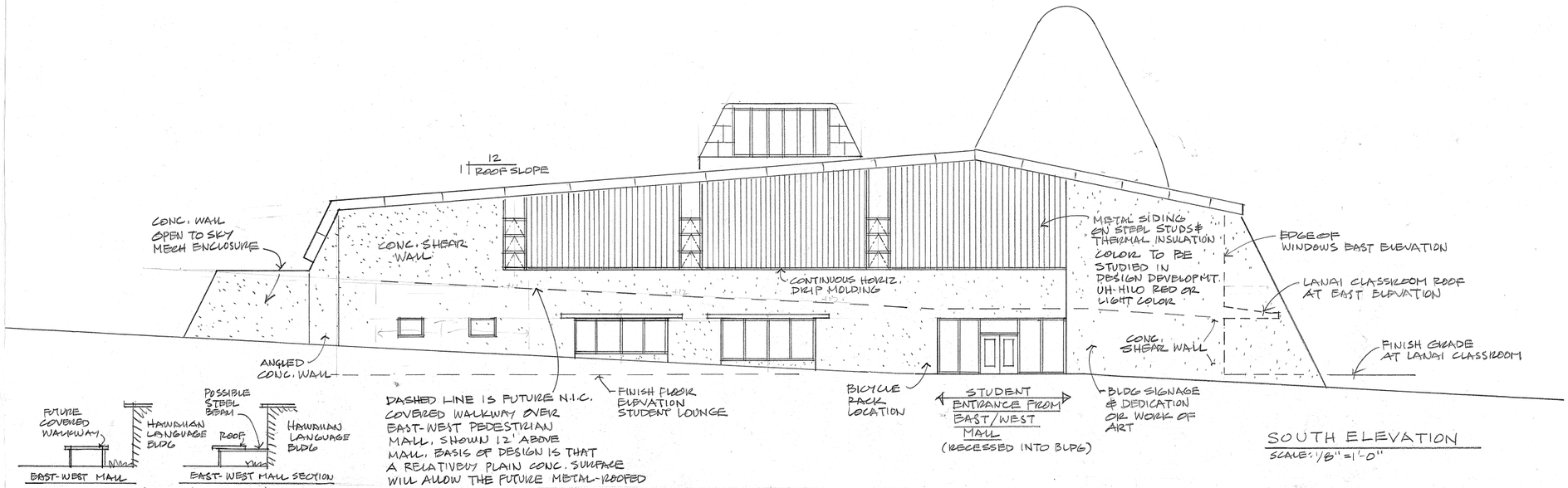
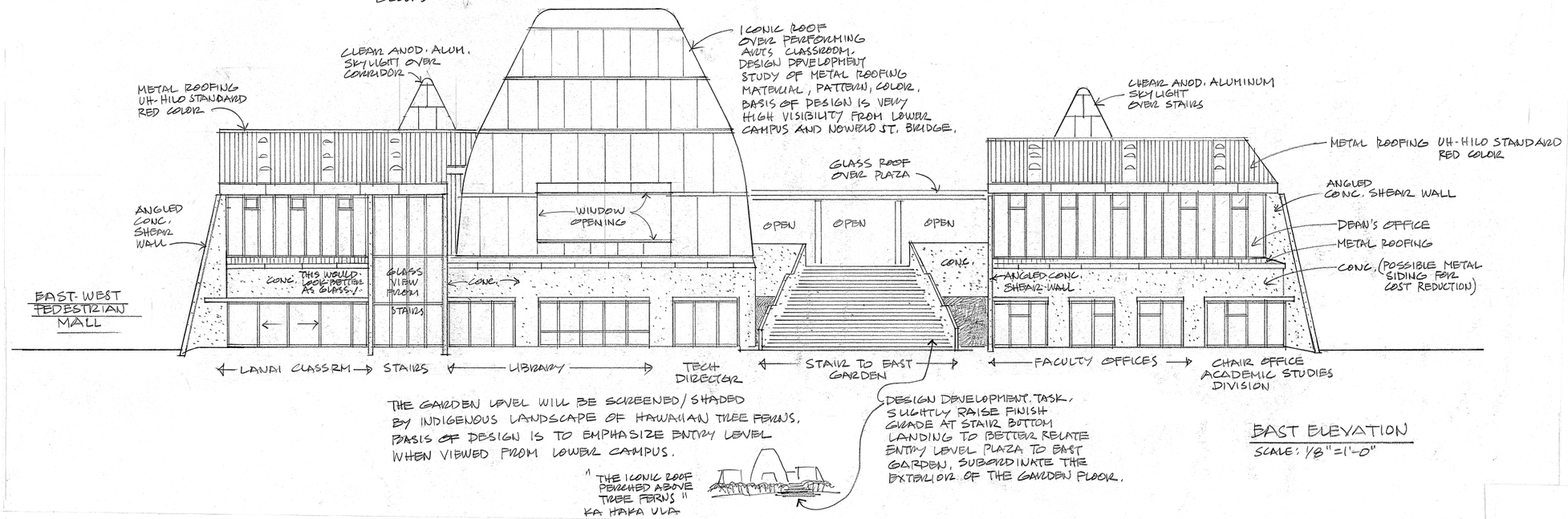


SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



EAST ELEVATION
SCALE: 1/8" = 1'-0"

THE GARDEN LEVEL WILL BE SCREENED/SHADED BY INDIGENOUS LANDSCAPE OF HAWAIIAN TREE FERNS. BASIS OF DESIGN IS TO EMPHASIZE ENTRY LEVEL WHEN VIEWED FROM LOWER CAMPUS.

"THE ICONIC ROOF PERCHED ABOVE TREE FERNS"
KA HAKA ULA

DESIGN DEVELOPMENT TASK. SLIGHTLY RAISE FINISH GRADE AT STAIR BOTTOM LANDING TO BETTER RELATE ENTRY LEVEL PLAZA TO EAST GARDEN, SUBORDINATE THE EXTERIOR OF THE GARDEN FLOOR.

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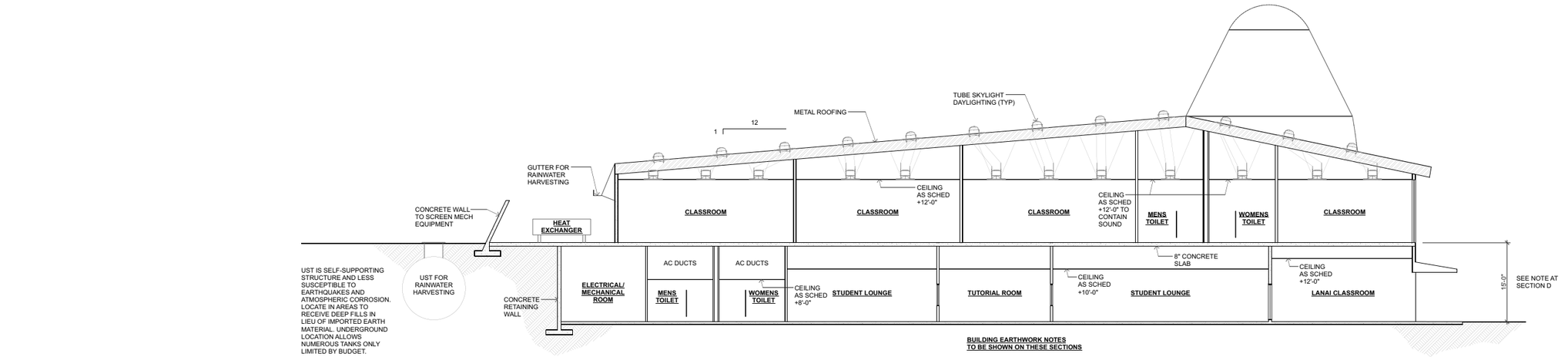
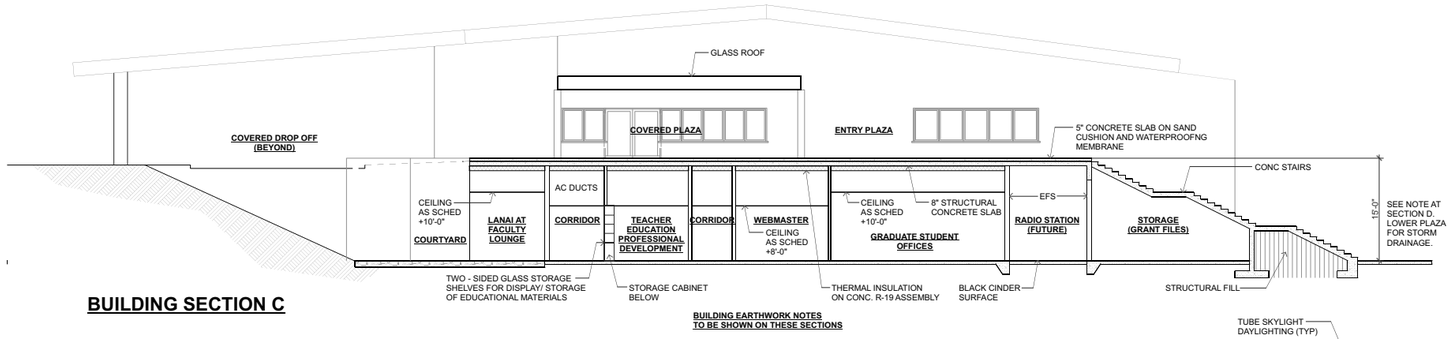
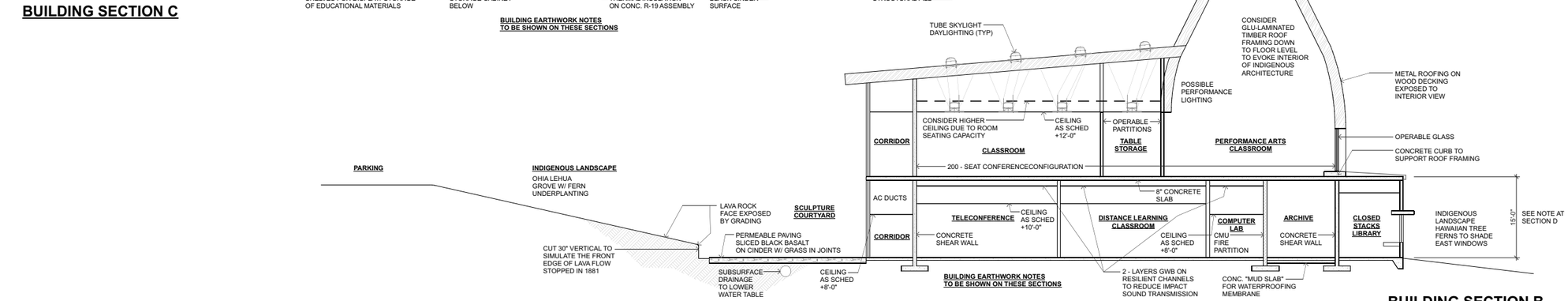


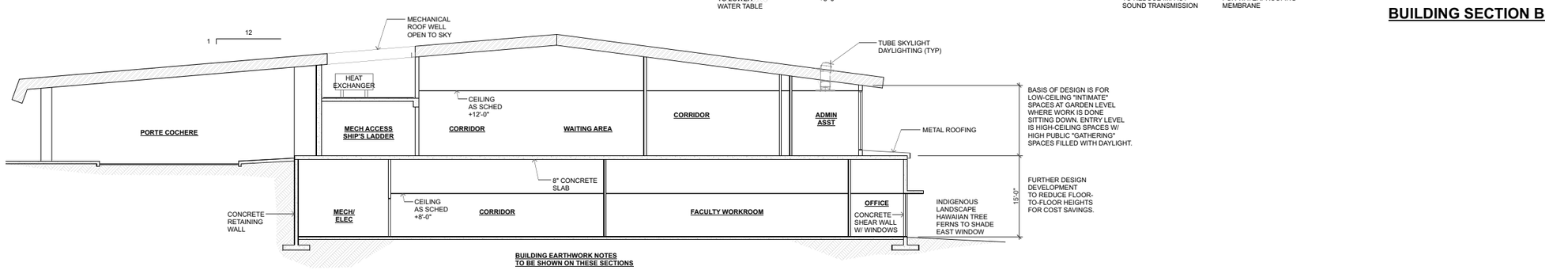
BUILDING SECTION A



BUILDING SECTION C



BUILDING SECTION B



BUILDING SECTION D

BUILDING SECTIONS

SCALE : 1/8" = 1'-0"

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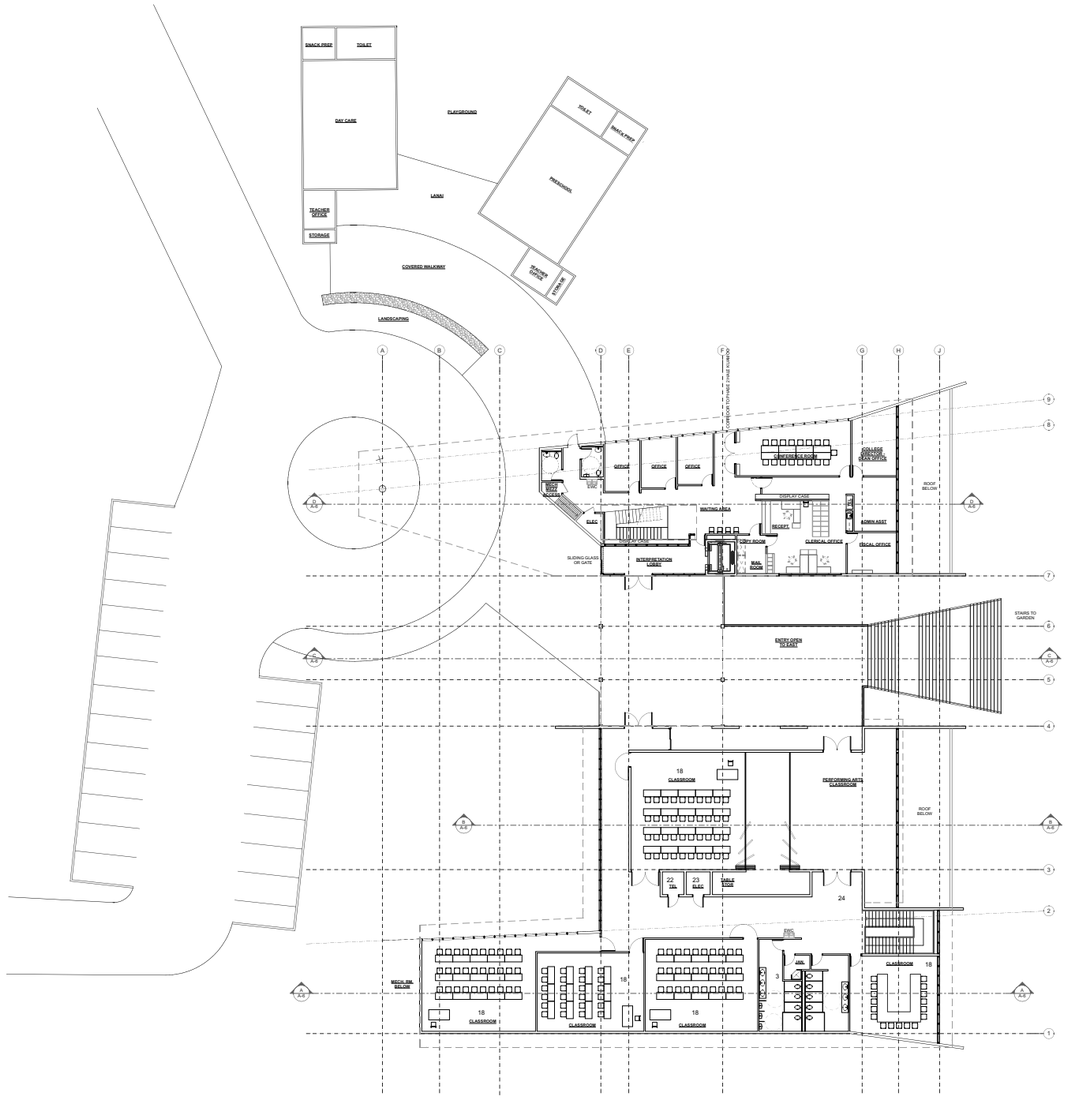

PRESCHOOL/ DAYCARE/ ENTRY LEVEL PLAN

SCALE : 1/16" = 1'-0"

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FIGURE NO. **A-7**

DATE 20 AUG 07

SHEET NO. OF

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TRUE NORTH
SCALE 1 In. = 30 Ft.

FUTURE CROSSWALK
STORM DRAIN INLET/ DW
DRAINAGE SWALE
CULVERT
CONNECT TO EXISTING WATERLINE
ROAD CENTERLINE, TYP.
STORM DRAIN INLET/ DW
PROPOSED 12" WATERLINE
TRASH ENCLOSURE
LANAI/ENTRY
JANITOR/ STORAGE
NOWELO STREET
STORM DRAIN INLET/ DW
CONNECT TO BUILDING SEWER, TYP.
PLAYGROUND
24.00' TYP.
24.00' TYP.
DAYCARE FFE 197.0
LANAI/PLAY AREA
DINING
CONNECT TO EXISTING SMH
RETAINING WALL
TW 197.0
BW 182.0
PROPOSED 6" SEWER LINE
FIRE HYDRANT
PROPOSED RETENTION BASIN
FIRE SPRINKLER
COVERED ENTRY
ENTRY/OPEN TO BELOW
CONNECT TO EXISTING SMH
PROPOSED 10" WATERLINE
CONNECT TO BUILDING SEWER, TYP.
PROPOSED 6" WATERLINE
EXIST. FFE 197.0
EXIST. GRADE 182.0
STAIRS/ GARDEN
INTERIM WALKWAY
PROPOSED 8" SEWER LINE
FIRE HYDRANT
PROPOSED 6" SEWER LINE
SEWER MANHOLE, TYP.
PROPERTY LINE, TYP.
191° 00' 528.00
180° 00' 350.00
207° 30' 330.00
N 78° 30' E 461.00
S 78° 30' W 461.00

LEGEND:
- FIRE HYDRANT
- STORM DRAIN INLET
- SEWER MANHOLE
- DRAINAGE SWALE DIRECTION
- SURFACE FLOW DIRECTION

GRAPHICAL SCALE:
30' 15' 0 30' 60'
SCALE: 1" = 30'

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PRELIMINARY SITE PLAN

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FIGURE NO. C-1

SHEET NO. 1 OF X

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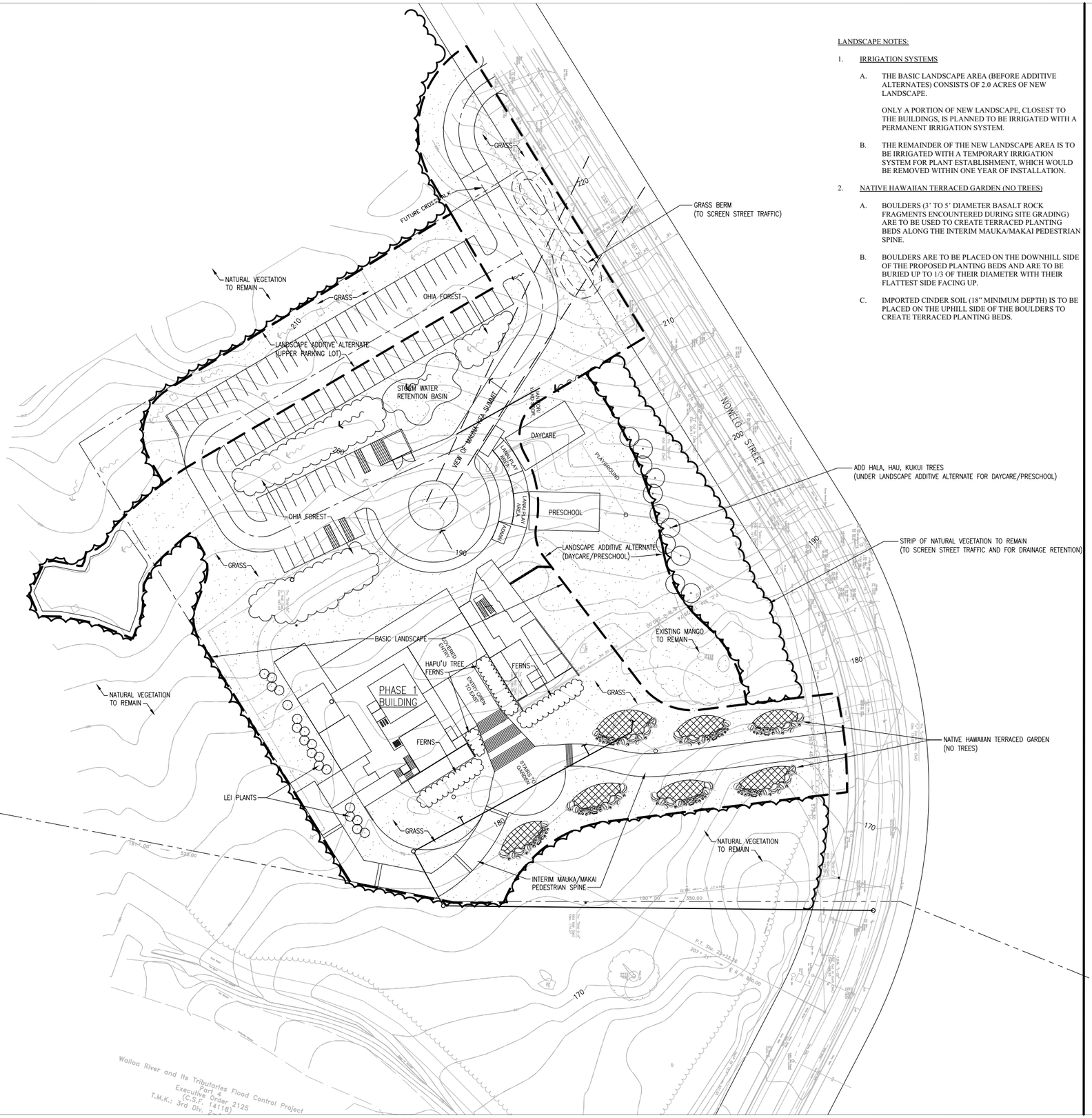

LANDSCAPE NOTES:

1. IRRIGATION SYSTEMS

   A. THE BASIC LANDSCAPE AREA (BEFORE ADDITIVE ALTERNATES) CONSISTS OF 2.0 ACRES OF NEW LANDSCAPE.

      ONLY A PORTION OF NEW LANDSCAPE, CLOSEST TO THE BUILDINGS, IS PLANNED TO BE IRRIGATED WITH A PERMANENT IRRIGATION SYSTEM.

   B. THE REMAINDER OF THE NEW LANDSCAPE AREA IS TO BE IRRIGATED WITH A TEMPORARY IRRIGATION SYSTEM FOR PLANT ESTABLISHMENT, WHICH WOULD BE REMOVED WITHIN ONE YEAR OF INSTALLATION.

2. NATIVE HAWAIIAN TERRACED GARDEN (NO TREES)

   A. BOULDERS (3' TO 5' DIAMETER BASALT ROCK FRAGMENTS ENCOUNTERED DURING SITE GRADING) ARE TO BE USED TO CREATE TERRACED PLANTING BEDS ALONG THE INTERIM MAUKA/MAKAI PEDESTRIAN SPINE.

   B. BOULDERS ARE TO BE PLACED ON THE DOWNHILL SIDE OF THE PROPOSED PLANTING BEDS AND ARE TO BE BURIED UP TO 1/3 OF THEIR DIAMETER WITH THEIR FLATTEST SIDE FACING UP.

   C. IMPORTED CINDER SOIL (18" MINIMUM DEPTH) IS TO BE PLACED ON THE UPHILL SIDE OF THE BOULDERS TO CREATE TERRACED PLANTING BEDS.

SCHEMATIC LANDSCAPE PLAN

TRUE NORTH
SCALE: 1 In. = 30 Ft.

GRAPHICAL SCALE:

30' 15' 0 30' 60'

SCALE: 1" = 30'

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SCHEMATIC LANDSCAPE PLAN

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FIGURE NO. L-1

DATE 13 AUG 07

SHEET NO. 1 OF 1

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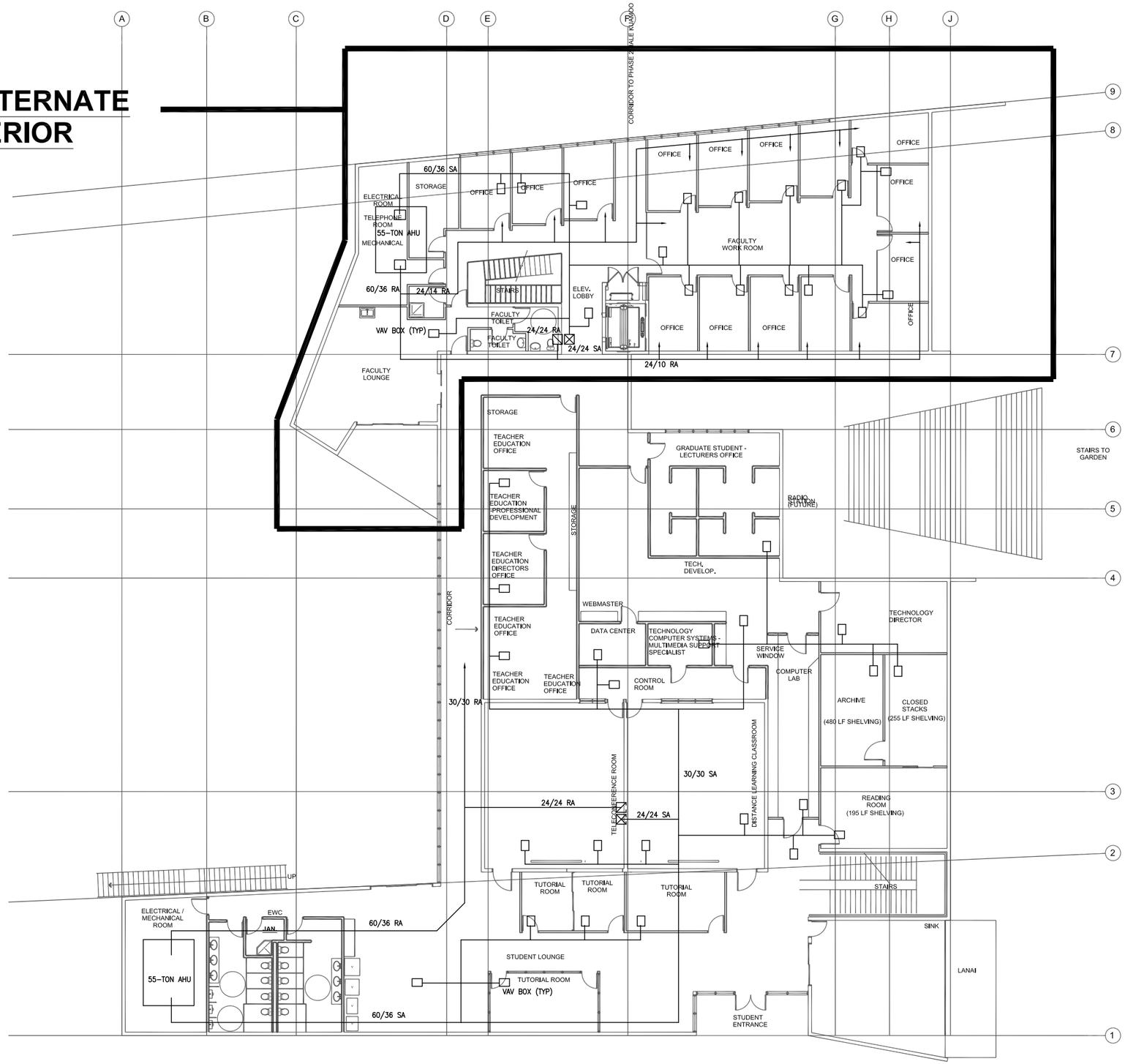
Thu, 16 Aug 2007 - 11:19am
I:\2005\2005_160.001 UH Hawaiian Lang Bldg Design-UHH\G Drawings\Contract Documents\070813 Schem Design\Lscp\L-1_SCHEMATIC-LANDSCAPE.dwg

ADDITIVE ALTERNATE (OFFICE INTERIOR FINISHING)



LOWER FLOOR MECHANICAL PLAN

SCALE: 1/8"=1'-0"

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DATE: XXX

SHEET NO. OF X

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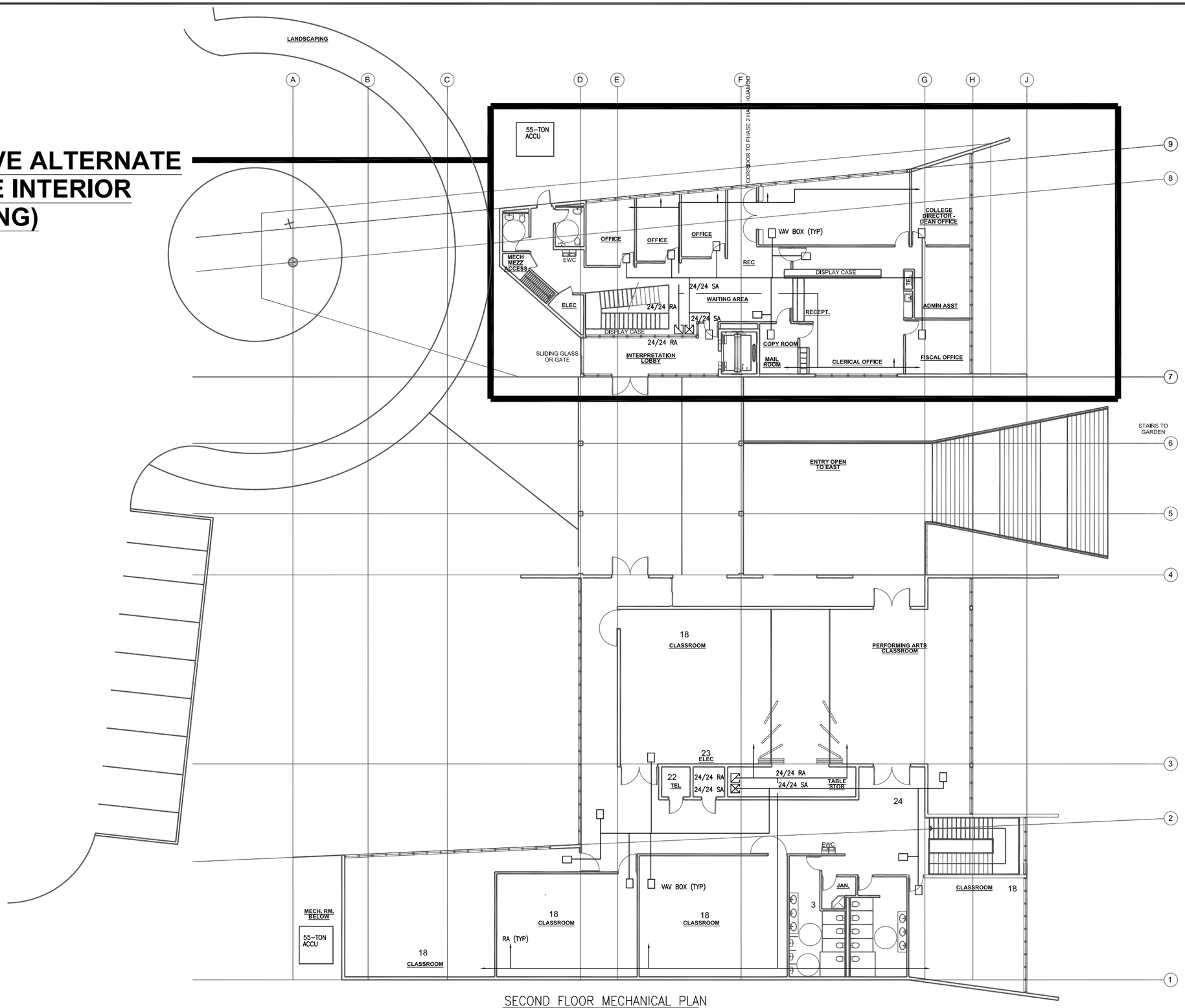

SECOND FLOOR MECHANICAL PLAN

SCALE: 1/8"=1'-0"

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FIGURE NO. M-2

SHEET NO. OF X

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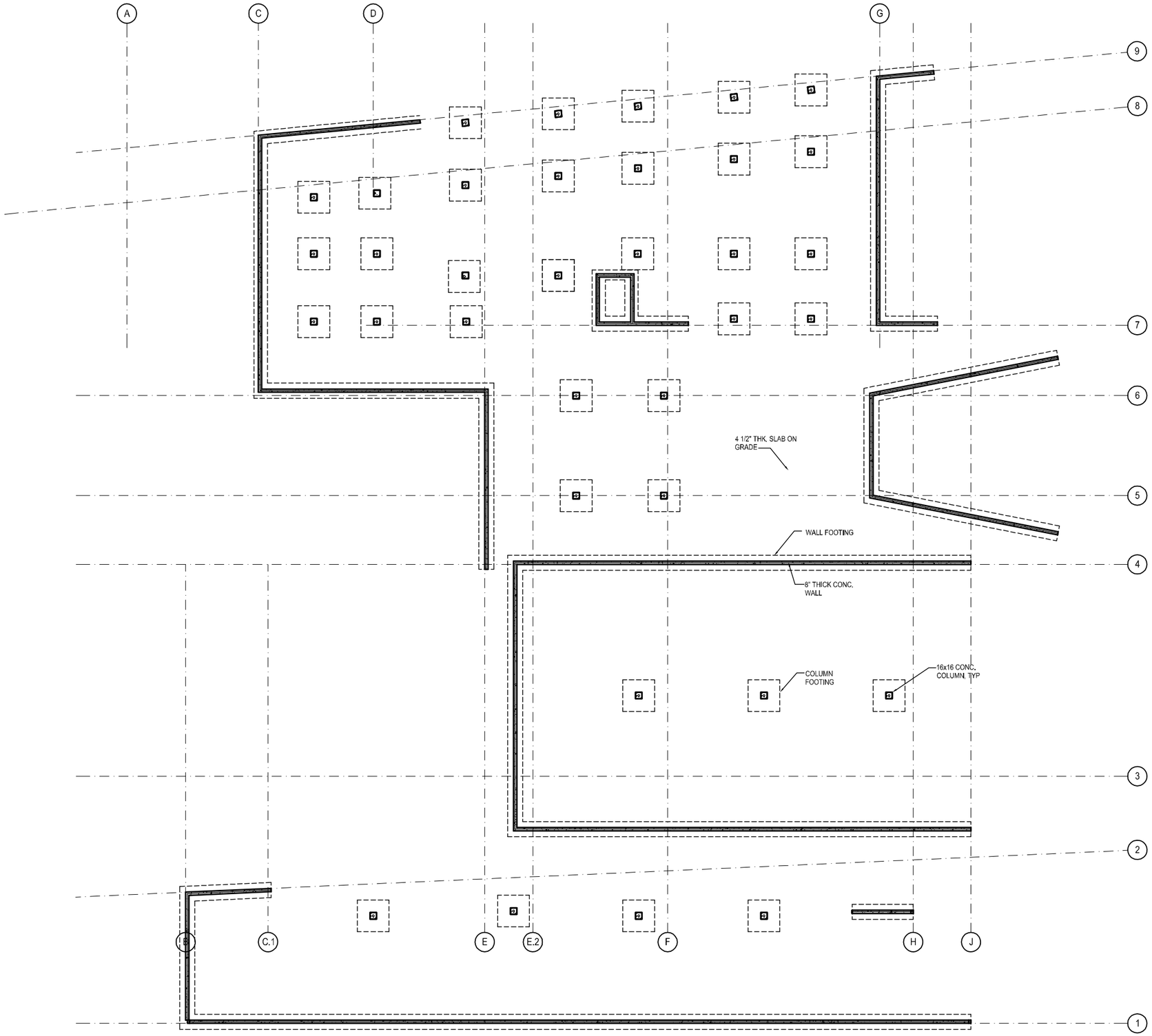

FOUNDATION AND GARDEN LEVEL PLAN

SCALE : 1/8" = 1'-0"

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FIGURE NO.
S-1

DATE: 30 JULY 07

SHEET NO. 01

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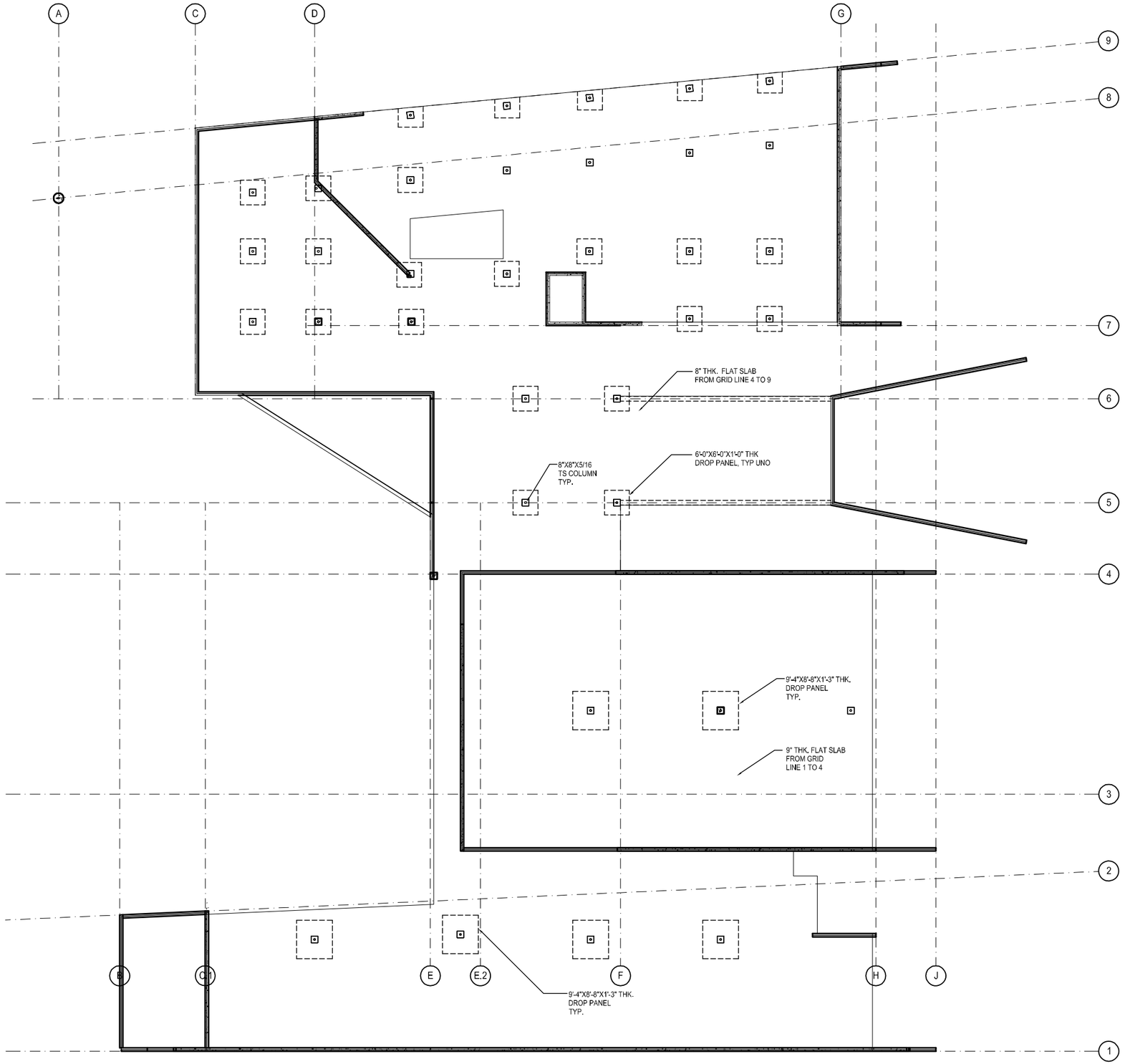

ENTRY LEVEL FRAMING PLAN

SCALE : 1/8" = 1'-0"

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S-2

DATE 30 JULY 07

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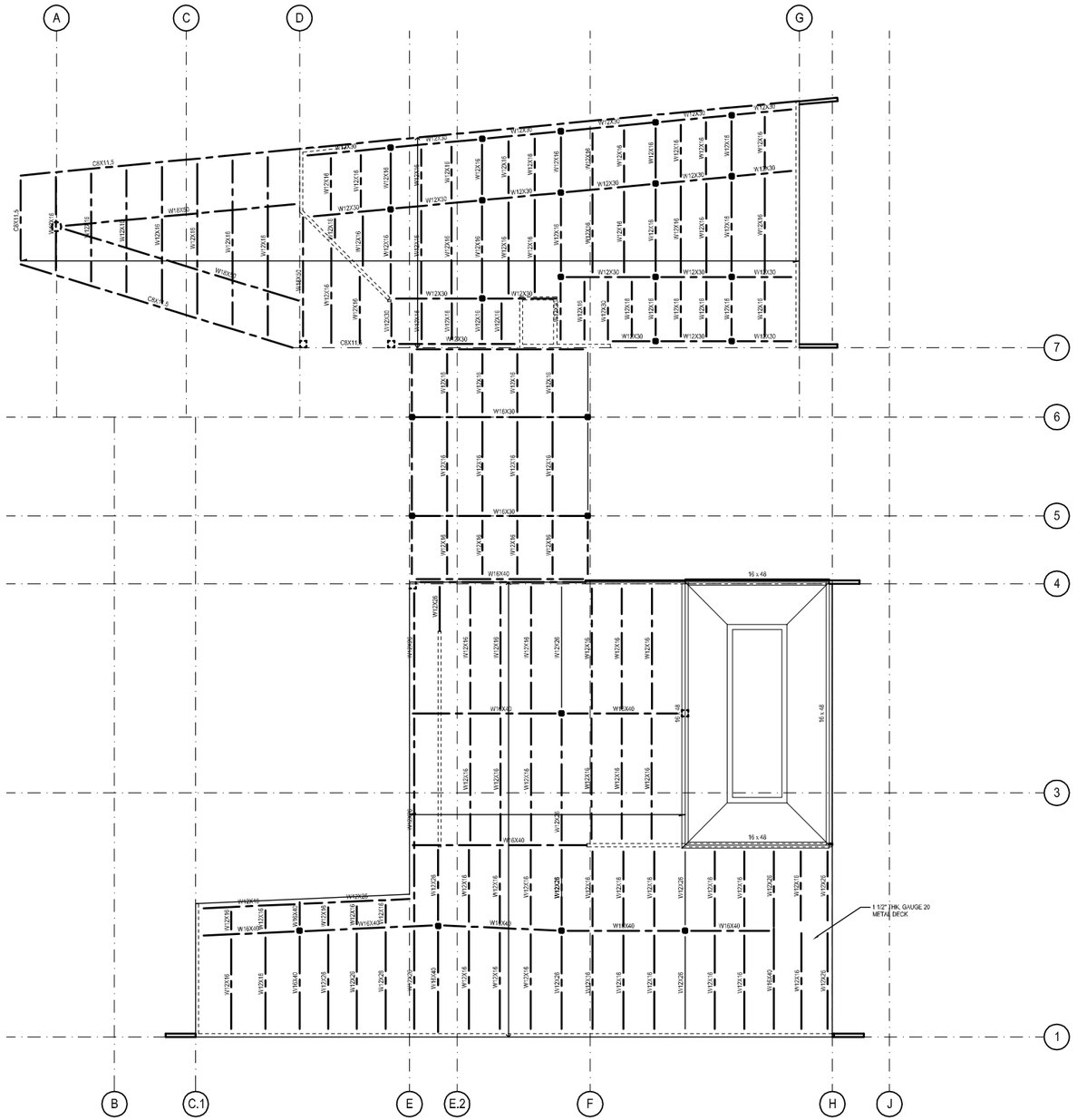

ROOF FRAMING PLAN

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FIGURE NO.
S-3

DATE: 30 JULY 07

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ENVIRONMENTAL ASSESSMENT

UNIVERSITY OF HAWAIʻI AT HILO
COLLEGE OF HAWAIIAN LANGUAGE FACILITIES

APPENDIX 5

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

PHASE I
ENVIRONMENTAL SITE ASSESSMENT REPORT
FOR
HAWAIIAN LANGUAGE BUILDING
UNIVERSITY OF HAWAII AT HILO
HILO, HAWAII 96720

TMK (3) 2-4-001:007

November 2006

Environmental Studies and Consulting Services

99-1046 Iwaena St. #210A, Aiea, Hawaii, USA 96701 • 808.484.9214

This Phase I ESA report is prepared for:

SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

PHASE I
ENVIRONMENTAL SITE ASSESSMENT
FOR
HAWAIIAN LANGUAGE BUILDING
UNIVERSITY OF HAWAII AT HILO
HILO, HAWAII 96720
TMK (3) 2-4-001:007

5 acres

MNA Job No. 20510

November 29, 2006

Joanna Boyette
Project Manager

Myounghee Noh
Principal Consulting Chemist

Myounghee Noh & Associates, L.L.C.
99-1046 Iwaena Street, Suite 210A
Aiea, Hawaii 96701
Tel (808) 484-9214
Fax (808) 484-4660
Toll free (888) 747-8448
www.noh-associates.com

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LIST OF ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation & Liability Information System
CFR	Code of Federal Regulations
CORRACTS	RCRA Facilities that are undergoing "corrective action"
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
HDOH	Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response
LUST	Leaking Underground Storage Tank
MGD	Million Gallons Per Day
MNA	Myounghee Noh & Associates, L.L.C.
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
TMK	Tax Map Key
TRIS	Toxic Release Inventory System
TSD	Treatment Storage and Disposal
UIC	Underground Injection Control
USGS	United States Geological Survey
UST	Underground Storage Tank

1.0 EXECUTIVE SUMMARY

Myounghee Noh & Associates, L.L.C. (MNA), was retained to conduct a Phase I Environmental Site Assessment (ESA) for the subject site located northwest of the baseball field at University of Hawaii at Hilo, Hawaii, 96720, in November 2006. This work was completed for SSFM International, Inc., 501 Sumner Street, Suite 620, Honolulu, Hawaii, 96817.

1.1 FINDINGS SUMMARY

Based on the information obtained during the site assessment performed in October-November 2006, MNA provides the following summary:

- **Database Search for Subject and Adjoining Sites**: The subject and adjoining properties were not listed in any of the federal or state databases searched by EDR (Appendix B). The findings are summarized in the table below.

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	6
Federal CERCLIS List	1/2 mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	1/2 mile	None
State-Equivalent CERCLIS	1/2 mile	None
State Landfill and/or Solid Waste Disposal Site List	1/2 mile	None
State Registered UST List	1/4 mile	None
State Leaking UST List (LUST)	1/2 mile	2
Federal RCRA Generators List	1/2 mile	1
Federal ERNS List	Subject site	None
State Spill List	Subject site	1

- **Site Check**: During a site check conducted on November 11, 2006, MNA observed the subject site and surrounding areas. The subject site was undeveloped and covered in dense vegetation, as was the site to the west. South and east of the subject site had been cleared of vegetation. The University of Hawaii at Hilo baseball field was visible from the subject site to the southeast.

- **Hazardous Materials and Regulated Wastes**: MNA observed no evidence of hazardous materials or regulated wastes on the subject and adjoining sites.

- **Storage Tanks**: MNA observed no USTs or ASTs in use at the subject property at the time of this ESA.

- **Potential Asbestos-, Polychlorinated Biphenyl (PCB)- or Lead-Containing Material:** MNA found no evidence of materials that could contain asbestos, lead, or PCBs.

- **Offsite Contamination Source:** MNA found no evidence of an offsite contamination source that could migrate to the subject site.

1.2 RECOGNIZED ENVIRONMENTAL CONDITIONS

MNA observed no *recognized environmental conditions* in connection with the subject property.

2.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA) of the subject site northwest of the baseball field at University of Hawaii at Hilo, Hawaii, 96720, TMK (3) 2-4-001:007 (Figure 1). This ESA was conducted by Myounghee Noh & Associates, L.L.C., herein referred to as MNA, for SSFM International, Inc., 501 Sumner Street, Suite 620, Honolulu, Hawaii 96817.

2.1 PURPOSE

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* (REC) at the subject site, with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. This practice is intended to permit a user to satisfy one of the requirements to qualify for the *innocent landowner defense* to CERCLA liability, "all appropriate inquiry into the previous ownership and uses of the site consistent with good commercial or customary practice." The term *recognized environmental conditions* denotes the presence, or likely presence, of any hazardous substances or petroleum products on the site under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the site or into the ground, ground water, or surface water of the site [American Society for Testing and Materials (ASTM), 2000].

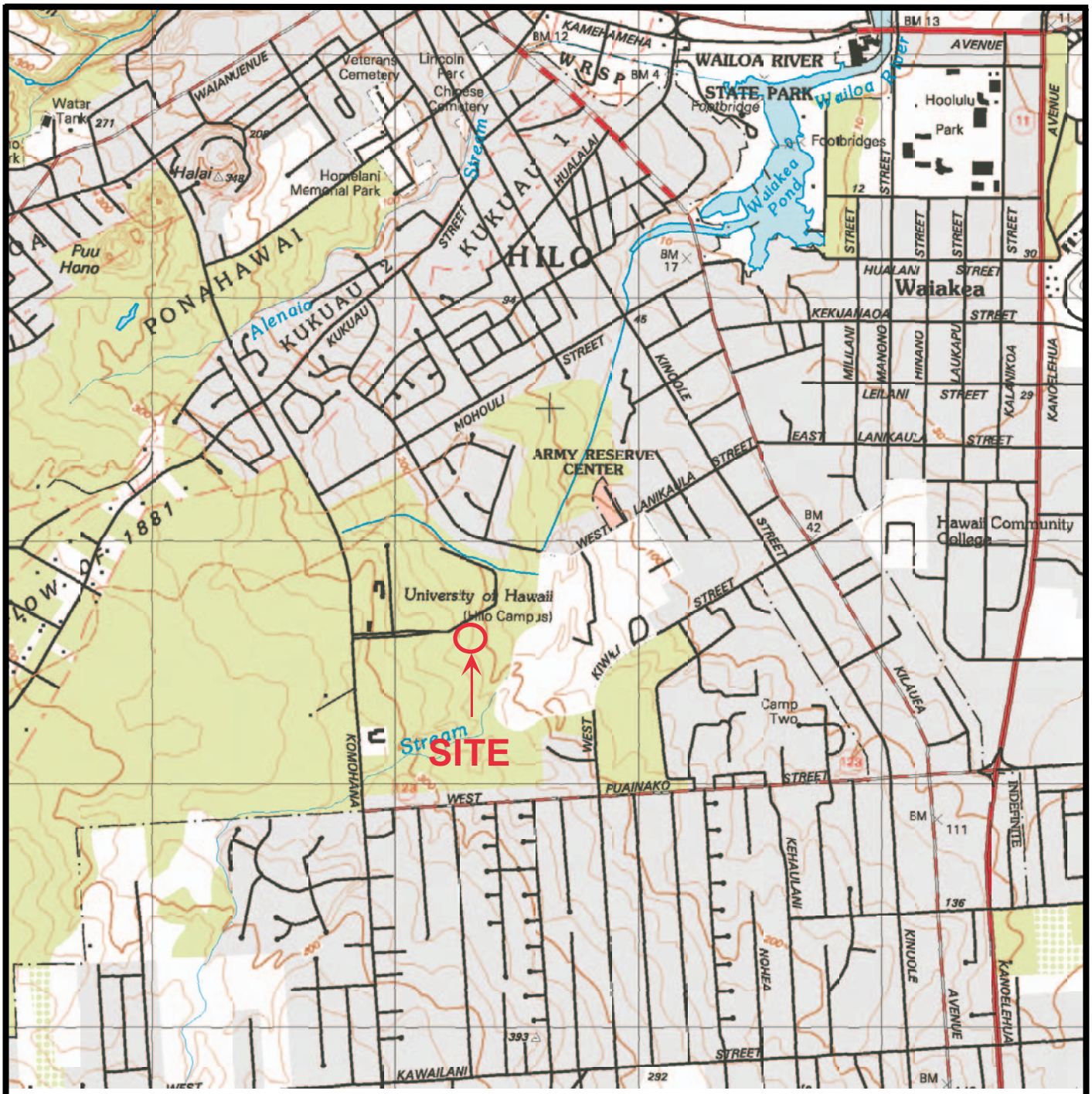
The assessment was performed in accordance with the prescribed practice in *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-00, 2000).

2.2 DETAILED SCOPE OF SERVICES

The Enhanced Phase I ESA has four components: Records Review; Site Reconnaissance; Interview; Report. MNA conducted the ESA using information sources with the potential to identify past or current releases of hazardous materials at the site. MNA performed the following:

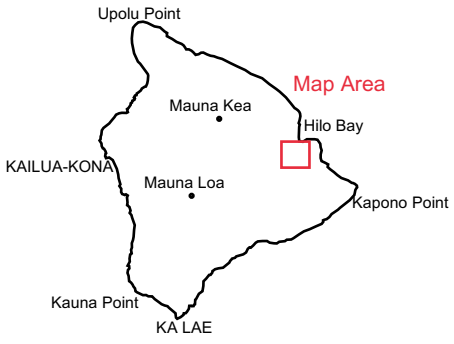
2.2.1 Site History

MNA examined documents consisting of topographic maps, tax records, and aerial photographs. The purpose of this basic research was to identify previous and current uses of the site, adjoining properties, and the surrounding area.



Source: USGS Topographic Map, 1998

Figure 1. Site Location



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2.2.2 Regulatory Records

MNA examined government records with respect to environmental conditions, citations, complaints, and permits at the subject site, at adjoining properties, and the surrounding area. MNA reviewed records from the following federal or state programs:

- National Priorities List (NPL)
- Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action" (CORRACTS)
- RCRA-Treatment, Storage, & Disposal (TSD)
- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List
- Solid Waste & Landfill
- Leaking Underground Storage Tank (LUST)
- Water Wells
- RCRA-Violators/Enforcement
- Underground Storage Tank (UST) list
- Toxic Release Inventory System (TRIS)
- Emergency Response Notification System (ERNS)
- RCRA-Large Generator
- RCRA-Small Generator
- Spills

2.2.3 Site Reconnaissance

MNA performed a site reconnaissance to obtain information indicating the likelihood of contamination, to interview available site personnel, if any, and conduct a brief assessment of the adjoining properties. During the site reconnaissance, MNA looked for stained surface soil, dead or stressed vegetation, hazardous materials, aboveground and underground storage tanks, disposal areas, groundwater wells, sumps, and storm drains.

2.2.4 Site Geology and Hydrogeology

MNA reviewed published information on surface and subsurface conditions at the site and surrounding area. MNA used this information to assess topography, drainage, surface water bodies, subsurface geology, and groundwater occurrence in the area to assess the impact of migration of any potentially hazardous materials in connection with the site.

2.2.5 Data Evaluation and Reporting

MNA evaluated the information collected and prepared this report documenting the assessment. Section 2 presents the introduction, Section 3 contains the site description, Section 4 contains information obtained from the user, Section 5 records review, Section 6 site reconnaissance, Section 7 personal interviews, Section 8 summary of findings, Section 9 opinion, and Section 10 conclusion.

2.3 SIGNIFICANT ASSUMPTIONS

The conclusion presented in this report is based upon the assumption that reasonably ascertainable and relevant information pertaining to the environmental condition of the subject site was made available to MNA during the assessment. Information obtained from government agencies and other resources is presumed to be accurate and updated.

2.4 LIMITATIONS AND EXCEPTIONS

The Phase I ESA provides a "snap shot" of the site conditions and is, by its nature, limited. Summary and conclusion apply to site conditions existing at the time of our investigation and those reasonably foreseeable. They cannot apply to site changes of which MNA is not aware of and has not had the opportunity to evaluate.

This report is based upon visual observations of the site and vicinity, and interpretation of the available historical and regulatory information and documents reviewed. MNA cannot ensure the accuracy of the historical or regulatory information. This report is intended exclusively for the purpose outlined, and applies only to the subject site.

This ESA does not include investigations regarding asbestos, lead paint, or geotechnical concerns.

2.5 SPECIAL TERMS AND CONDITIONS

This Phase I ESA was conducted and prepared by MNA for the exclusive use of SSFM International, Inc., and the University of Hawaii. This report shall not be relied upon or transferred to any other party without written authorization from SSFM International, Inc., or the University of Hawaii.

2.6 USER RELIANCE

This report is an instrument of service of MNA, which summarizes its findings and opinions with respect to the subject site history and *recognized environmental conditions* at the subject site. Note that said findings and opinions are predicated on information that MNA obtained on the dates and from individuals stated herein, from public records review, a site reconnaissance, and ancillary Phase I ESA assignments. This assessment relies upon the accuracy and completeness of the information provided. The information obtained for this assessment is used without extraordinary verification. It is possible that other information exists and is discovered, or environmental conditions change subsequent to submittal of this Phase I ESA report to SSFM International, Inc., to which MNA shall not be held responsible for exclusion there from.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The subject site is the parcel located at University of Hawaii at Hilo, Island of Hawaii (Figure 1). Tax Map Key of the site is Division 3, Zone 2, Section 4, Plat 001, and Parcel 007. The property is classified as Unimproved Residential. The Fire Insurance Rate Map designation is Flood Zone X, which is outside the 500 year flood plain. According to the County of Hawaii record, the parcel consists of approximately 143 acres.

3.2 SITE AND VICINITY GENERAL CHARACTERISTICS

Hilo is located on the windward (eastern) side of the Island of Hawaii, the youngest and largest island in the Hawaiian Archipelago. The city is situated between the island's two major volcanic mountain peaks, Mauna Kea and Mauna Loa, and has a population of 40,759, according to the 2000 U.S. Census Population (Foronda, 2001). The project site is located in the Waiakea region of the district.

Polynesian inhabitants settled along the shores of Hilo Bay as early as 1100 AD and began farming, fishing, and trading their goods along the Wailuku River (HDIA, 2005). With King Kamehameha I's unification of the islands in 1791, Hilo emerged as a significant locality in Hawaiian history. Not only was the city an ideal location for the King to headquarter his efforts to conquer the neighboring islands, it was abundant in resources including sugarcane, taro, bananas, coconuts, and breadfruit trees (Foronda, 2001).

The city maintained a subsistence-based economy until the early 1800s when the arrival of the sandalwood trade, the intensification of the whaling industry, and the arrival of New England missionaries (funded by the American Board of Commissions of Foreign Ministries) generated a shift to market-based economic practices (PBR Hawaii, 2004). Sugar plantations first surfaced at this time, but cattle, timber, and whaling industries remained the prime contributors to Hilo's economic growth. This economic trend continued until the mid-1800s when the sugarcane industry gained momentum and a dependable Hawaiian sugar trade was established. Several changes in land use were observed at the beginning of the 20th century as sugarcane production continued to intensify in the early 1900s. Areas deemed too rocky for sugarcane production were allocated as pasture for the Parker and Shipman Ranches. In the 1920s, many areas in the Waiakea region were designated as forest reserve (PBR Hawaii, 2004).

In the second half of the 20th century, a multitude of major construction projects were completed in the Hilo region including wharfs in Hilo Bay, bridges, breakwater, the Hilo Airport, and Saddle Road, which runs between Mauna Kea and Mauna Loa to the other side of the island (PBR Hawaii, 2004). Despite these major structural accomplishments, the mid- to late-1900s also brought economic hardship to the Hilo area. The sugarcane and sea trade industries began declining while attempts to establish a tourism industry were unsuccessful due to the area's high annual rainfall, vulnerability to natural disasters, and devastation from the tsunami (Foronda, 2001).

Restoration efforts to preserve the city's historic elements and revive the economy took off in the 1980s and 1990s (Foronda, 2001). Because of these restoration endeavors, the city has experienced a significant turnaround, although not without periodic downturns. In recent times, tourism has emerged as the city's primary industry. However, the Hilo district also plays a strong supporting role in the island's agriculture industry through its cultivation of tropical fruits, flowers, and macadamia nuts (PBR Hawaii, 2004).

Original construction of the UH Hilo campus began in 1970 and has expanded to encompass the 143 acres it occupies today. The campus is approximately two miles southwest of Hilo airport. The proposed Ka Haka Ula 'O Ke 'elikolani College of Hawaiian Language building is bound by Nowelo Street to the north, Waiakea Stream to the east and wooded areas to the south and the west.

3.2.1 Geology

Published geologic and hydrogeologic reports and maps were reviewed to obtain information regarding subsurface conditions in the general area of the property. The Island of Hawaii is of volcanic origin and was built by the Kohala, Mauna Kea, Mauna Loa, Kilauea, and Hualalai volcanoes and is comprised of numerous thin, extremely permeable tholeiitic basalt lava flows (Stearns, 1985).

Hawaii, the youngest and largest Hawaiian Island, is as large as all the others combined. In 1996, Hazlett and Hyndman described the island as follows:

> It sprawls over an area the size of Connecticut, spanning 90 miles from north to south and 80 miles from east to west. Five large volcanoes coalesce to make the visible part of the Big Island; a sixth lies buried beneath the surface. The southern part of the island is still volcanically active and building out along much of the coastline. To the north, volcanism is in the waning stages. Of all the Hawaiian Islands, the Big Island shows the greatest diversity of rocks and landscapes.

The project site consists of two soil types characterized by the U.S. Soil Conservation Service Soil Survey, they are: Keaukaha extremely rocky muck and Panaewa very rocky silty clay loam, both overlay pahoehoe flows. The slope of the site descends slightly from the southern boundary to the north- northeast with the lowest zone parallel to Nowelo Street.

Keaukaha extremely rocky muck is dark brown in color and strongly acidic. This soil type is rapidly permeable, runoff is moderate and the erosion hazard is minor. Panaewa very rocky silty clay loam has high porosity. Surface soil is characterized by silty clay loam reaching typical depths of 6-12 inches. The subsoil is a coarser, mixed silt/cobble stratus. Permeability is high, runoff moderate, and the erosion hazard is minor. Pahoehoe is smooth billowy basaltic lava. Its undulating path defines the features of the present landscape. Pahoehoe permeability is slow and runoff is moderate.

3.2.2 Hydrogeology

The permanent source of potable groundwater is a basal aquifer. This aquifer is floating on and displacing salt water, which saturates the base of the island. The basal aquifer is recharged by precipitation. The precipitation percolates through soil and rock until it is either confined by an impermeable layer or floating on basal salt water (Stearns, 1985). The groundwater in the region is known to be either basal water floating on salt water or water perched on ash, soil, or alluvium and underlain with basal water (Stearns, 1985). In 1993, Water Resources Research Center described the water as follows:

> A voluminous basal lens extends at least 4 miles inland of the coast, beyond which high-level water has been encountered. The lens may reach farther inland, but it has hardly been explored. Toward the rift zone dike-impounded high-level water probably occurs. Elsewhere the high-level water is likely to be perched. The flux of groundwater in the basal lens is enormous; the fresh water springs at Hilo-Waiakea have been measured at 150 million gallons per day (mgd). The gradient is about 5 ft/mile, and the permeability of the basalt is probably at least 5,000 ft/day.

The Hawaii Department of Health (HDOH) has established an Underground Injection Control (UIC) line to serve as a boundary between drinking and non-drinking water portions of underlying aquifers. Areas above (mauka side of) the UIC line are within drinking-water portions of the aquifer, while areas below (makai side of) the UIC are within non-drinking water portions of the underlying aquifer. Since the subject site is located on the makai side of the UIC line, it lies within a non-drinking water portion of the local aquifer, and only limited types of injection wells are allowed in the area. Furthermore, injection wells in the area require a UIC Permit or Permit Exemption from the HDOH. According to the Mink & Lau Technical Report #191, published by the University of Hawaii Water Resources Research Center, the subject site is located above one aquifer as indicated in Table 1 (Mink, 1990).

Table 1. Aquifer Classification System

Aquifer Code	**80401111**
Island Code	8 – Island of Hawaii
Aquifer Sector	04 – Northeast Mauna Loa
Aquifer System	01 – Hilo
Aquifer Type, hydrogeology	1 – Basal
Aquifer Condition	1 – Unconfined
Aquifer Type, geology	1 – Flank
Status Code	**11111**
Development Stage	1 – Currently used
Utility	1 – Ecologically important
Salinity (in mg/L Cl^-)	1 – Fresh (<250)
Uniqueness	1 – Irreplaceable
Vulnerability to Contamination	1 – High

3.3 CURRENT USE OF THE SITE

Currently the subject site is undeveloped and covered with vegetation.

3.4 STRUCTURES, ROADS, AND OTHER IMPROVEMENTS

The site is bordered by Nowelo Street to the north, Waiakea Stream to the east and wooded areas to the south and the west. The subject site does not have city water or sewer systems.

3.5 PAST USES OF THE SITE AND SURROUNDING AREA

Information regarding past uses of the subject site was obtained from interview, review of tax records, and aerial photographs. The current owner, State of Hawaii, has owned the site since 1970. Table 2 lists the users and property uses of the subject site.

Table 2. Users and Primary Uses of the Subject Sites

Period (approx.)	Property User	Area (acre)	Primary Use
1970-2006	State of Hawaii University of Hawaii	142.81	University of Hawaii at Hilo
1960-1970	William K. Kamau	22.25	Dairy farm
1950-1960	Fairview Diary, Ltd.	22.25	Dairy farm
1948-1960	Territory of Hawaii	22.25	Undocumented
1939-1948	Waiakea Mill Co.	21.90	Undocumented

4.0 USER PROVIDED INFORMATION

4.1 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

No environmental liens or activity and use limitations are known for the subject site. The subject site was assessed by MNA for *recognized environmental conditions* including petroleum and other hazardous material releases.

4.2 SPECIALIZED KNOWLEDGE

MNA is not aware of any specialized knowledge pertaining to the subject site.

4.3 VALUATION REDUCTION

MNA is not aware of any information pertaining to the valuation reduction of the subject site.

4.4 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

The subject site is owned by the University of Hawaii. Currently it is unoccupied.

4.5 REASON FOR PERFORMING A PHASE I

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* at the Hawaiian Language Building, University of Hawaii at Hilo, Hawaii (TMK 2-4-001:007), particularly CERCLA impacts (from hazardous substances releases or spills), which may affect the real estate ownership transaction of the subject site.

5.0 RECORDS REVIEW

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES

5.1.1 General Overview

MNA used Environmental Data Resources, Inc., (EDR) (800-352-0050) for searching standard federal and state government databases of known or potential sources of hazardous materials or waste. The record sources are listed in Appendix A, and the EDR assessment report is provided in Appendix B. MNA conducted further local searches as needed.

ASTM E 1527-00 specifies a minimum search distance for specific environmental record sources. The following sources are specified for incidents or sites within one mile of the subject site:

- Federal NPL site list
- Federal RCRA CORRACTS TSD facilities list
- State hazardous waste sites (State-equivalent NPL)

The following sources are specified for incidents or sites within one-half mile of the subject site:

- Federal CERCLIS list
- Federal RCRA non-CORRACTS TSD facilities list
- State-equivalent CERCLIS
- State landfill and/or solid waste disposal site list
- State leaking UST list

The following sources are for incidents on the subject and adjoining properties:

- Federal RCRA generators list
- State registered UST list

Finally, the following is for incidents for the subject site:

- Federal ERNS list

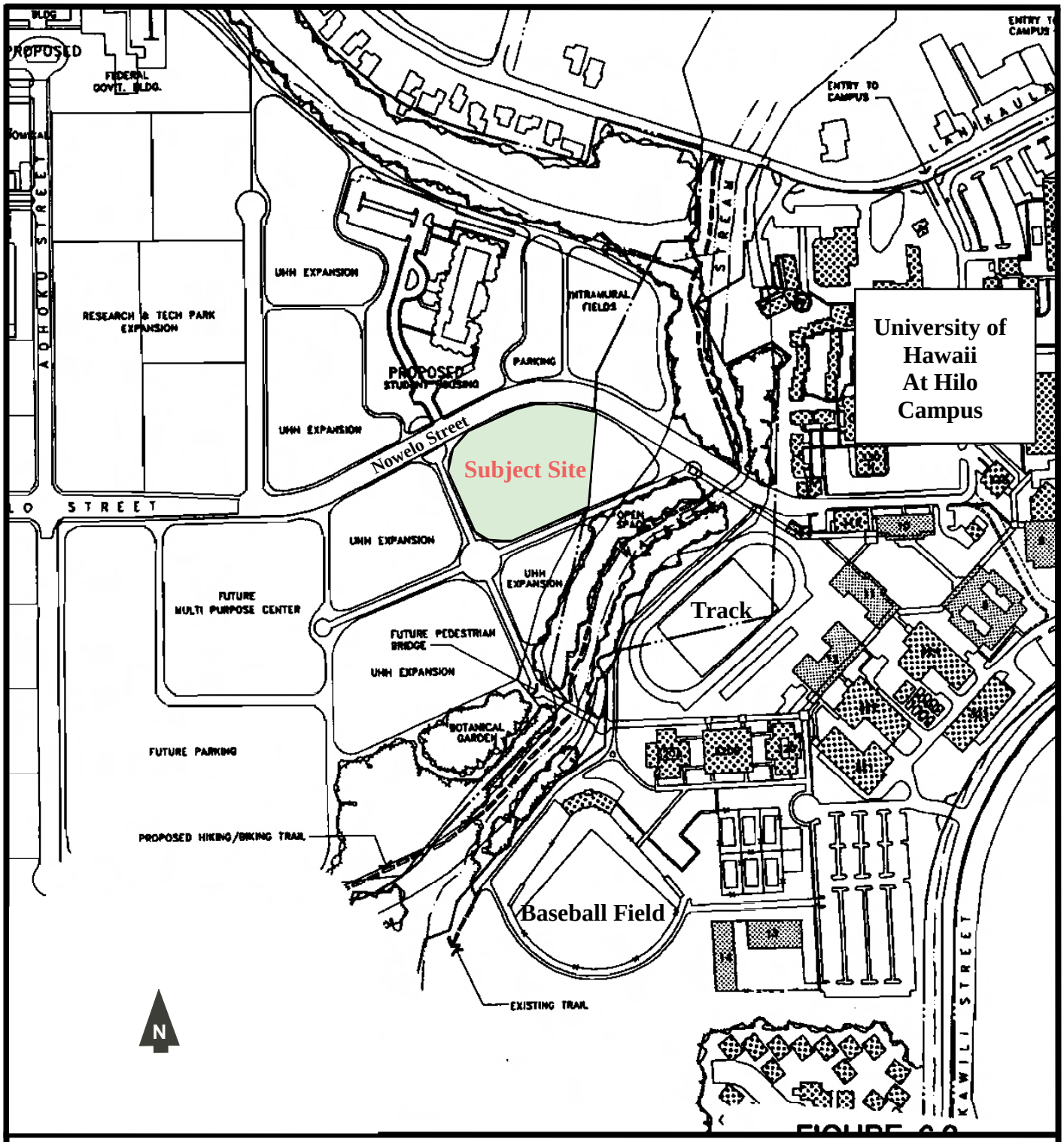
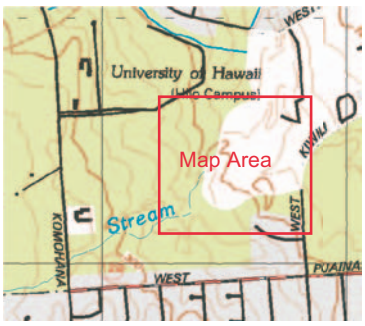


Figure 2. Site Map (not to scale)



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5.1.2 Federal National Priorities List

The NPL, compiled by the Environmental Protection Agency (EPA), is a list of sites with the highest priority for cleanup under the EPA's Hazard Ranking System [40 Code of Federal Regulations (CFR) Part 300]. EDR found no NPL sites within one mile of the subject site (EDR, 2006).

5.1.3 Federal RCRA CORRACTS TSD Facilities List

The RCRA CORRACTS TSD facilities list is compiled by the EPA. The list contains those RCRA regulated facilities, which are undergoing "corrective action" due to a release of hazardous substance. EDR revealed no facilities within one mile of the subject site (EDR, 2006).

5.1.4 State Hazardous Waste Sites (State-equivalent NPL)

The State Hazardous Waste Sites are sites or areas in which the Office of Hazard Evaluation and Emergency Response (HEER) has an interest, has investigated or may investigate. EDR found 6 hazardous waste sites listed within one mile of the subject site (EDR, 2006). Table 3 lists those sites and a map showing the location with respect to the subject site is provided in Appendix B.

Table 3. State Hazardous Waste Sites

Facility	Site	Address
University of Hawaii at Hilo	Target Property	200 W. Kawili Street
USDA Forest Service PSW Experimental Station	4,036 ft. E	1643 Kilauea Avenue
Sun Sun Lau Chop Suey House	4,261 ft. NNE	1055 Kinoole Street
Hilo Shopping Center	4,340 ft. NE	1255 Kilauea Avenue
Hilo Quality Cleaners	5,102 ft. N	865 Kinoole Street
Hilo Quality Washerette	5,198 ft. N	210 Hoku Street

5.1.5 Federal CERCLIS List

The CERCLIS list, compiled by the EPA, contains sites currently or formerly under review by EPA for potential hazardous substance contamination for possible inclusion on the NPL. EDR found no CERCLIS sites listed within 1/2 mile of the subject site (EDR, 2006).

5.1.6 Federal RCRA non-CORRACTS TSD facilities list

The RCRA non-CORRACTS TSD facilities list, compiled by the EPA, contains RCRA permitted treatment, storage, and disposal facilities. EDR found no RCRA TSD site listed within 1/2 mile of the subject site (EDR, 2006).

5.1.7 State Landfill / Solid Waste Disposal Sites

The HDOH records contain an inventory of permitted landfills in the State of Hawaii. EDR found no permitted solid waste landfills, incinerators, or transfer stations within 1/2 mile of the subject site (EDR, 2006).

5.1.8 State Registered UST List

This database is compiled by the HDOH Solid and Hazardous Waste Branch, UST section. EDR's search revealed no UST sites within 1/4 mile of the subject site.

5.1.9 State Leaking UST (LUST) List

This database is compiled by the HDOH Hazardous Waste Branch, UST section. EDR and HDOH's database searches found no LUST sites within 1/2 mile of the subject site (EDR, 2006). The University of Hawaii at Hilo was listed on the LUST site list for two separate incidents. Cleanup has been completed for both incidents in 1999 and 2000 (HDOH, 2006).

5.1.10 Federal RCRA Generators List

This database, compiled by the EPA, contains RCRA registered small or large quantity generators of hazardous waste. RCRA Large Quantity Generators are facilities that generate at least 1,000 kg/month of non-acutely hazardous waste (or 1 kg/month of acutely hazardous waste). RCRA Small and Very Small Quantity Generators are facilities that generate less than 1,000 kg/month of non-acutely hazardous waste. EDR's search found no generators within 1/2 mile of the subject site. The University of Hawaii at Hilo was listed as a RCRA Small Quantity Generator (EDR, 2006).

5.1.11 Federal ERNS List

The ERNS list, compiled by the EPA, contains CERCLA hazardous substance releases or spills, as maintained at the National Response Center. EDR's search revealed no reported incident on the subject site (EDR, 2006).

5.1.12 State Spill List

This database is compiled by the HDOH Hazard Evaluation and Emergency Response (HEER) office. EDR and MNA's search revealed a spill at the University of Hawaii at Hilo. On April 22, 2003, petroleum contaminated soil was discovered during an excavation near the auto shop on campus, approximately 500 feet from the subject site. The amount and source of contamination was unknown (EDR, 2006; HEER, 2006).

5.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

There are no further environmental record sources known to MNA that are likely to have additional environmental information pertaining to the subject property.

5.3 HISTORICAL USE INFORMATION ON THE SUBJECT SITE

5.3.1 Aerial Photographs

Aerial photographs of the subject and adjoining properties were reviewed at the R.M. Towill Corporation in Honolulu. Photographs reviewed are summarized as follows:

1949: The subject site and surrounding area were undeveloped and covered with vegetation. To the east and south residences were visible.

1951: No significant changes were depicted in the 1951 photograph.

1952: No significant changes were depicted in the 1952 photograph.

1977: The University of Hawaii at Hilo was visible. Schools were shown to the southwest. Residences were visible to the east, west, and south. North of the subject site remained undeveloped.

1985: The baseball field was visible southeast of the subject site. A school was visible to the south, and more residences to the northeast.

1992: More buildings were visible at the University of Hawaii at Hilo campus. More residences were visible to the east.

1998: The subject site remained undeveloped and covered with vegetation. More housing was visible to the northwest.

No readily apparent evidence of *recognized environmental conditions* at the subject or adjoining properties was noted on any of the aerial photographs reviewed.

5.3.2 Historical Topographic Maps

Historical United States Geological Survey (USGS) topographic maps for the subject site and vicinity were reviewed for the years 1963, 1981, and 1995. The maps depicted the following:

Quadrangle: Hilo, Hawaii Scale: 1:24,000 Series 7.5 Minute

1963: The subject site and surrounding area were undeveloped. To the east the University of Hawaii at Hilo campus was visible with only twelve buildings.

1981: The subject site and surrounding area were undeveloped. The University of Hawaii at Hilo campus had expanded to the east. North of the subject site more roadways were visible.

1995: The map did not show enough detail to view the subject site or surrounding area.

No readily apparent evidence of *recognized environmental conditions* at the subject or adjoining properties was noted on any of the topographic maps reviewed.

5.3.3 Sanborn Fire Insurance Maps

Sanborn Fire Insurance maps were not available for the subject site or surrounding area.

6.0 SITE RECONNAISSANCE

6.1 METHODOLOGY AND LIMITING CONDITIONS

Joanna Boyette conducted the site reconnaissance. The reconnaissance focused on identifying historical, current, and potential CERCLA impacts, which may affect ongoing and expanded use of the subject site. This includes identifying the presence, or likely presence, of any hazardous substances or petroleum products on the site under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the site or into the ground, ground water, or surface water of the site (ASTM E 1527-00, 2000).

6.2 GENERAL SITE SETTING

The subject site is located in Hilo, Hawaii, and it is situated to the south of Nowelo Street. The subject site was undeveloped and covered in dense vegetation, as was the site to the west. South and east of the subject site had been cleared of vegetation. The University of Hawaii at Hilo baseball field was visible from the subject site. The site location is depicted in Figure 2, and photographs are presented in Appendix C.

6.3 HAZARDOUS MATERIALS AND REGULATED WASTES

MNA observed no evidence of hazardous materials or regulated wastes at the subject site or surrounding area.

6.4 UNDERGROUND STORAGE TANKS

MNA observed no signs of storage tanks, such as dispenser pumps, fill pipes, or vent pipes.

6.5 ABOVEGROUND STORAGE TANKS

MNA observed no signs of aboveground storage tanks at the subject site or in line of sight in the surrounding area.

6.6 ASBESTOS, LEAD, & PCB INDICATIONS

MNA found no evidence of materials containing asbestos, lead, or PCBs.

6.7 SOLID WASTE DISPOSAL

MNA observed no signs of waste accumulation on the subject site.

6.8 PHYSICAL SETTING ANALYSIS AGAINST POTENTIAL MIGRATION

MNA found no potential offsite contamination sources that may migrate to the subject site.

7.0 INTERVIEWS

7.1 SSFM INTERNATIONAL, INC.

MNA interviewed Stephen Yee of SSFM International, Inc. Mr. Yee stated that a rock wall was located on the subject site that could be attributed to past agricultural use. He had not seen the wall. He was not aware of any underground or aboveground storage tanks on the subject site. Further, he was not aware of any hazardous materials on the subject site.

7.2 UHH FACILITIES PLANNING AND CONSTRUCTION

MNA intervied Lo-Li Chih, Director of Financial Planning (808-974-7595). Mr. Chih stated that there was no past use of the subject site. He was not aware of any USTs or ASTs, and there were no hazardous materials on site. Mr. Chih was not aware of any environmental conditions on the subject site.

7.3 UHH VICE CHANCELLOR

MNA attempted to interview Bill Chen, Vice Chancellor (808-974-7750); however, Mr. Chen was unavailable for comment.

8.0 SUMMARY OF FINDINGS

Based on the information obtained during the site assessment performed in October-November 2006, MNA provides the following summary:

- **Database Search for Subject and Adjoining Sites**: The subject and adjoining properties were not listed in any of the federal or state databases searched by EDR (Appendix B). The findings are summarized in the table below.

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	6
Federal CERCLIS List	1/2 mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	1/2 mile	None
State-Equivalent CERCLIS	1/2 mile	None
State Landfill and/or Solid Waste Disposal Site List	1/2 mile	None
State Registered UST List	1/4 mile	None
State Leaking UST List (LUST)	1/2 mile	2
Federal RCRA Generators List	1/2 mile	1
Federal ERNS List	Subject site	None
State Spill List	Subject site	1

- **Site Check**: During a site check conducted on November 11, 2006, MNA observed the subject site and surrounding areas. The subject site was undeveloped and covered in dense vegetation, as was the site to the west. South and east of the subject site had been cleared of vegetation. The University of Hawaii at Hilo baseball field was visible from the subject site to the southeast.

- **Hazardous Materials and Regulated Wastes**: MNA observed no evidence of hazardous materials or regulated wastes on the subject and adjoining sites.

- **Storage Tanks**: MNA observed no USTs or ASTs in use at the subject property at the time of this ESA.

- **Potential Asbestos-, Polychlorinated Biphenyl (PCB)- or Lead-Containing Material:** MNA found no evidence of materials that could contain asbestos, lead, or PCBs.

- **Offsite Contamination Source:** MNA found no evidence of an offsite contamination source that could migrate to the subject site.

9.0 OPINION

MNA observed no evidence of adverse environmental conditions in connection with the subject site. Based on the recorded use information on the subject site, and the visual inspection of the site, it is our opinion that there are no environmental problems.

10.0 CONCLUSION

MNA performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM E 1527-00 of the site located at TMK (3) 2-4-001:007, Hilo, Hawaii, 96720. Any exceptions to, or deletions from, this practice are described in Section "2.4 LIMITATIONS AND EXCEPTIONS." MNA concludes that there are no *recognized environmental conditions*.

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APPENDIX A

Regulatory Record Sources

- National Priorities List (NPL) - The NPL is the U.S. Environmental Protection Agency's (EPA) database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund program. A site must meet or surpass a predetermined hazard ranking system score, be chosen as a state's top priority site, or meet three specific criteria set jointly by the U.S. Department of Health and Human Services and the EPA in order to become an NPL site.

- CORRACTS - The EPA maintains this database of Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action." A "corrective action order" is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

- RCRA-Treatment, Storage, & Disposal (TSD) CORRACTS - The EPA's RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities, which report generation, storage, transportation, treatment, or disposal of hazardous waste.

- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List - The CERCLIS list contains sites, which are either proposed to or on the NPL and sites, which are in the screening and assessment phase for possible inclusion on the NPL. The information on each site includes a history of all pre-remedial, remedial, removal and community relations activities or events at the site, financial funding information for the events, and unrestricted enforcement activities.

- NFRAP - NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.

- RCRA-TSD - The RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities, which report generation, storage, transportation, treatment, or disposal of hazardous waste. RCRA TSDs are facilities, which treat, store and/or dispose of hazardous waste.

- Solid Waste & Landfill - The database can be obtained from the Hawaii Department of Health (HDOH), Solid and Hazardous Waste Branch (808.586.4240).

- Leaking Underground Storage Tank (LUST) - This database can be obtained from the HDOH Solid and Hazardous Waste Branch Underground Storage Tank (UST) Section (808.586.4226).

- Water Wells - The Ground Water Site Inventory (GWSI) database was provided by the U.S. Geological Survey (USGS, 702.648.6819). The database contains information for

over 1,000,000 wells and other sources of groundwater, which the USGS has studied, used, or otherwise had reason to document through the course of research.

- RCRA-Viol/Enf - The RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. RCRA Violators are facilities, which have been cited for RCRA Violations at least once since 1980. RCRA Enforcements are enforcement actions taken against RCRA violators.

- UST list - This database can be obtained by the HDOH UST Section (808.586.4226). The agency release date for UST Section Database was January 2002.

- Toxic Release Inventory System (TRIS) - Section 313 of the Emergency Planning and Community Right-to-Know Act (also known as SARA Title III) of 1986 requires the EPA to establish an inventory of Toxic Chemicals emissions from certain facilities. Facilities subject to this reporting are required to complete a Toxic Chemical Release Forms (Form R) for specified chemicals.

- Emergency Response Notification System (ERNS) - This is a national database containing records from October 1986 to the release date below and is used to collect information for reported releases of oil and hazardous substances (202.260.2342). The database contains information from spill reports made to federal authorities including the EPA, the U.S. Coast Guard, the National Response Center, and the Department of Transportation.

- RCRA-LgGen - RCRA Large Generators are facilities, which generate at least 1,000kg/month or non-acutely hazardous waste (or 1kg/month of acutely hazardous waste).

- RCRA-SmGen - RCRA Small and Very Small Generators are facilities, which generate less than 1,000kg/month or non-acutely hazardous waste.

- SPILL - This database can be obtained from the HDOH Hazard Evaluation Emergency Response office (HEER, 808.586.4249). The Spills list provides a short description of circumstances of each spill.

Note: For reasons of bulk, Appendices B, C and D are not included in this EA document. The entire Phase I ESA is on file at offices of SSFM and available for inspection by contacting Stephen Yee, (808) 933-2727.