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GOVERNOR OF HAWAII

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

PAUL J. CONRY
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ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 22, 2010

Katherine Puana Kealoha, Esq., Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Dear Ms. Kealoha,

Subject: Finding of No Significant Impact (FONSI) for Connections Public Charter School Master Plan, TMK (3) 2-5-006:141, South Hilo, Hawai'i

The Department of Land and Natural Resources has reviewed the comments received during the thirty (30) day public comment period which began on August 23, 2010. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the next available OEQC Environmental Notice.

We have emailed a completed OEQC Publication Form to your office and submitted one hard copy and one .pdf format of the Final Environmental Assessment.

If there is anything we can help you with or if you have any questions, please do not hesitate to contact Charlene Unoki from my Land Division at 587-0433. Thank you.

Sincerely,

Paul J. Conry

for Laura H. Thielen
Chairperson

Final Environmental Assessment

For the

CONNECTIONS PUBLIC CHARTER SCHOOL MASTER PLAN

Kaumana, South Hilo, Hawai'i
Tax Map Key: (3)2-5-006:141

Prepared for:

Connections Public Charter School
174 Kamehameha Avenue
Hilo, Hawai'i 96720

Prepared by:

Wil Chee – Planning & Environmental

October 2010

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for Laura H. Thielen
Chairperson

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ACRONYMS

BMP	Best Management Practices
cm	centimeter
CWDA	critical wastewater disposal area
DLNR	State of Hawai‘i, Department of Land and Natural Resources
DOH	State of Hawai‘i, Department of Health
DWS	County of Hawai‘i, Department of Water Supply
EA	Environmental Assessment
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
gpd	gallons per day
HAR	Hawai‘i Administrative Rules
HELCO	Hawaii Electric Light Company
HRS	Hawai‘i Revised Statutes
IWS	Individual Wastewater System
km	kilometer
LEED	Leadership in Energy and Environmental Design
LOS	Level-of-Service
msl	mean sea level
NPDES	National Pollution Discharge Elimination System
SHPD	State Historic Preservation Division
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
TMP	Traffic Management Plan
UBC	Uniform Building Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION AND PROJECT SUMMARY

1.1 Project Profile

Project Name:	Connections Public Charter School Campus Master Plan
Applicant:	Connections Public Charter School 174 Kamehameha Ave Hilo, Hawai'i 96720 John L. Thatcher II, CEO
Approving Agency:	State of Hawai'i Department of Land and Natural Resources
EA Consultant:	Wil Chee - Planning & Environmental 1018 Palm Drive Honolulu, Hawai'i 96814 Contact: Celia Shen
Tax Map Key:	(3) 2-5-006:141
Land Area:	72.43 acres, more or less
Location:	Ponahawai, Kaūmana, Kukuau 2nd, South Hilo
Land Owner:	State of Hawai'i (DLNR)
Existing Uses:	Vacant
Proposed Uses	Pre-K through Grade12 school
Land Use Classifications:	
State Land Use:	Agriculture
Hawaii County General Plan:	Low Density Urban
Zoning:	Agriculture 1-acre (A-1a)
Special Management Area:	Project is not within the SMA

Anticipated Permits and Approvals:

Special Permit	County of Hawai'i Planning Department and State Land Use Commission
NPDES Permit	Hawai'i State Department of Health
Wastewater System plans	Hawai'i State Department of Health
Water Reuse Project	Hawai'i State Department of Health
Building Permit	County of Hawai'i Department of Public Works
Grading Permit	County of Hawai'i Department of Public Works
Well Construction Permit (if applicable)*	State Commission on Water Resource Management
Pump Installation Permit (if applicable)*	State Commission on Water Resource Management
Public Water System*	State of Hawai'i Department of Health

* It is the school's intention to satisfy their water supply needs through a combination of the municipal water system, rain catchment water, and recycled water. If during design, it is determined that their water needs cannot be met through these sources, and that developing a well is needed to support the project, these permits and approvals would be needed.

1.2 Project Background

Connections Public Charter School (also referred to as "Connections") was chartered by the State Board of Education in 2000, and authorized under signature of the Governor of the State of Hawai'i, the President of the State Board of Education, and the State Superintendent of Schools. Connections opened in August 2000, with 184 students in grades K-6. By August 2001, the school had expanded to a K-12 program with a total of 360 students. The need and desire for this unique charter school is evidenced by an enrollment waiting list and is further illustrated by the broad-based community representation in the operation of the school.

The school's faculty have been recognized for their innovative work, which has resulted in the school being designated as a "Demonstration Site" for the University of Hawai'i Mānoa Curriculum Research and Development Group. This designation has resulted in Connections becoming a major clearinghouse for emerging curriculum, as well as a center for teacher development.

Connections is based in the Hilo area. Currently, the elementary and middle school is located in the Kress Building on Kamehameha Avenue in downtown Hilo. The Kress building is owned by the school's affiliated non-profit organization. The high school is presently located in leased facilities at the Nani Mau Gardens, just outside of Hilo town. For the sake of long-term planning and budgeting, the school would prefer to not lease property from private owners. The desire to vacate the leased facilities in which the high school operates has provided the impetus to explore options for consolidating all of their academic programs at a single location. Consolidation provides an attractive option for management, operational, and financial reasons. Thus, began a search for suitable properties on which to develop new facilities for the school. In coordination with the State of Hawai'i Department of Land and Natural Resources (DLNR), a property in Kaūmana was identified by the school as a potential site for the new campus. Subsequently, a master plan was prepared to guide development of the new campus that would co-locate its elementary, middle, and high schools on a single property and would allow for program expansion. Connections would like to add a sustainable agricultural program to their academic offerings. Also, at present, Connections does not have a pre-kindergarten program, but may choose to implement one in the future if demand exists and if adequate facilities can be provided. Connections is presently in the process of acquiring a long-term lease agreement for this property with DLNR.

1.2.1 Revised Draft Environmental Assessment (EA)

A Draft Environmental Assessment (EA) addressing the campus master plan was prepared and distributed for agency and public comment in August of 2009. Several comments were received on the Draft EA regarding potential impacts to Kaūmana Cave, a segment of which underlies portions of the subject property. After further research and review, it was determined that reconfiguring the campus plan to avoid Kaūmana Cave and any potential conflicts was prudent. A Revised Draft EA was prepared to analyze the potential impacts of the reconfigured campus plan. The Revised Draft EA was distributed for public and agency comment in August 2010. In this Final EA, the reconfigured campus plan is presented as the Proposed Action and the original campus plan is depicted as Alternative 1.

1.3 Scope and Authority

This EA has been prepared pursuant to Hawai‘i Revised Statutes (HRS), Chapter 343 (the EIS law) and associated Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR), Department of Health (DOH), State of Hawai‘i. The use of State lands for the proposed action triggers the environmental review process under HRS Chapter 343. The intent of this EA is to ensure that comprehensive and systematic consideration is given to potential impacts of the proposed action upon the natural and man-made environment. Completion of the environmental review process pursuant to HRS Chapter 343 is required by DLNR prior to finalization of the long-term lease agreement referenced above.

This EA is intended to serve as an environmental disclosure document which identifies the purpose and need of the proposed action, reasonable implementation alternatives, existing environmental conditions, potential environmental impacts, and mitigation measures to avoid or minimize such impacts. The findings presented in this EA will provide the basis to determine whether an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI) is appropriate.

1.4 Proposed Action

The proposed action being evaluated in this EA is the conceptual master plan for a new school campus for Connections. The master plan would guide development of a new campus in Kaūmana, South Hilo, Hawai‘i. The new campus would consolidate all of Connections’ existing academic programs at a single location, plus provide land area and facilities to expand their academic offerings. Facilities included in the master plan would accommodate the elementary, intermediate, and high school programs and supporting services; an agricultural program; a small dormitory facility; and a pre-Kindergarten (pre-K) program. The master plan proposes facilities to support approximately 380 K through grade 12 students, 30 non-traditional students, and 25 pre-K students.

1.5 Purpose and Need for the Proposed Action

The purpose of the proposed action is to relocate and establish a new school campus that would provide a long-term base of operations for Connections, and improve the quality of education the school can provide its students.

The action is needed because the school would like to better manage and operate their facilities by consolidating all of their academic programs at a single location. Further, a new location outside of downtown Hilo would provide an improved educational environment and the land area to expand their academic program. The need to find a new location for the high school precipitated the effort to consolidate their facilities. Development of a new campus with co-located school facilities would meet the following needs:

- Eliminate the high rental costs for the high school facilities.
- Provide space for a small dormitory (30-student maximum capacity).

- Provide the land area necessary to establish an agricultural program as part of the curriculum. Facilities needed to support the agricultural program include greenhouses, a horse barn, and land area for cultivation.

Building a new campus from the ground up would provide the opportunity to develop academic facilities that are tailored to Connections' specific educational philosophy and approach to teaching and learning, and would provide a unique learning environment for this multi-cultural, globally-oriented charter school.

1.6 Summary of Potential Impacts and Mitigation Measures

The Proposed Action is not expected to cause any significant adverse long-term impacts to the environment. However, potential short-term, temporary impacts could occur during the construction period. These include impacts on the acoustical environment, air quality, soils, fauna, and lava tube collapse. The following protective/mitigation measures would be implemented to minimize the potential for these short-term, temporary impacts.

Acoustical Environment: Construction activities that generate noise would be conducted in compliance with applicable regulations. If construction noise is expected to exceed the DOH's maximum permissible property line noise levels, a permit per HAR 11-46, *Community Noise Control*, would be obtained and additional mitigation measures could be imposed by DOH.

Air Quality: Construction activities would be conducted in compliance with all applicable air quality regulations, including provisions contained in HAR 11-60.1-33 *Fugitive Dust*. Construction site best management practices (BMPs) to minimize dust and emissions would be implemented. BMPs may include erection of dust screens around the construction site, frequent watering of unpaved roadways and bare areas, and paving and/or landscaping bare earth areas as soon as practicable, among other management practices.

Soils and Surface Water: Implementation of protective measures during construction would minimize any impacts on soils and reduce the potential for sediment-laden runoff to affect water resources. Typical measures include erosion control devices such as cut-off ditches, temporary ground cover vegetation, and various soil stabilization and protection materials. Adherence to construction site BMPs and conditions of the grading permit and NPDES permit should prevent any potential effects to soils and surface water.

Fauna: To reduce the potential for affecting Hawaiian hoary bats, it is recommended that clearing and grubbing not be undertaken during the birthing and pup rearing season. If clearing cannot be avoided during this period, it is recommended that a survey be conducted to verity if bats are present on-site.

To avoid disturbance to nesting Hawaiian Hawks, tree clearing should be avoided during the breeding season from March to September. If tree clearing must be conducted during this period, it is recommended that a survey be conducted to verify if any Hawaiian Hawks are present. If nesting activity is detected, consultation with the USFWS would be required

prior to conducting further clearing activity within 500 meters of the nest tree.

To reduce the potential for affecting nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting be shielded.

Lava Tube Collapse: To minimize the potential hazard due to the collapse of an unknown lava tube that may be located within the project site, a geotechnical investigation should be performed for construction areas and appropriate measures employed to address site specific conditions. Such measures could include backfilling the lava tube; spanning the tube with girders or other means of support to minimize stress on the cave roof; or modifying the facility layout to avoid the lava tube altogether. If a lava tube should be encountered during construction, construction activity would be stopped and the proper authorities, including the Department of Land and Natural Resources would be contacted, so that an assessment can be made.

To avoid construction-related impacts to Kaūmana Cave, the cave's alignment should be verified prior to initiating construction and delineating boundaries of the 100-foot buffer. During construction, the boundaries of the buffer zone should be clearly marked with brightly colored surveyors tape or similar. Construction personnel should be fully informed of Kaūmana Cave, adherence to the buffer zone, and the potential risk of working within vicinity of the cave. If, during construction on the lower parcel, an entrance to the inaccessible portion of Kaūmana Cave is found or inadvertently created, or if previously unknown segments of the Kaūmana Cave system are encountered, all construction activity in the vicinity of the find would cease immediately and the proper authorities, including the Department of Land and Natural Resources, contacted to assess the lava tube and its contents.

1.7 Unresolved Issues

This EA only addresses the conceptual master plan for the proposed school campus. Specific details of campus' development would be determined during the project's design phase. This includes details on the design and implementation of the proposed water and wastewater systems. If issues are encountered that warrant additional environmental review, a supplemental EA could be prepared, to address these specific issues or substantial deviations from the conceptual master plan.

1.8 Determination

Based on the information gathered during preparation of this EA, it is anticipated that the direct, indirect, and cumulative effects of the Proposed Action would not have a significant adverse effect on the natural or human environment. Consequently, the approving agency, the Department of Land and Natural Resources, has issued a Finding of No Significant Impact. Findings and determinations are discussed in further detail in Section 5.0.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action (Preferred Alternative)

2.1.1 Project Location

The proposed project site is located in Kaūmana, South Hilo, on the eastern side of the Island of Hawai‘i. It is a vacant, undeveloped, state-owned parcel of land identified as Tax Map Key (TMK) (3)2-5-006:141 and is designated as Section 5(b) Ceded Lands. The project site is approximately 72.34 acres in size and is situated on Mauna Loa's lower slopes, above Hilo town, and south of Kaūmana Drive (Figures 2-1 and 2-2).

The project site is separated into two parcels at its narrowest point by Edita Street. The upper parcel comprises approximately 37 acres, and the lower parcel 35 acres. The lower parcel is characterized largely by non-native trees and weeds and the upper parcel by a native ‘ōhi‘a forest with an understory of uluhe (Pacific false staghorn fern).

The majority of the property is situated within the ahupua‘a of Ponahawai, with a very small sliver along its southern edge falling within the ahupua‘a of Kukuau 2. The parcel is bounded along much of its perimeter by residences on Kaūmana Drive, Edita Street and Melemanu Street. Just west of the property, on the far side of Kaūmana Drive, is the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park.

2.1.2 Project Features

The master plan addresses the incremental development of a new academic campus for the Connections Public Charter School. The campus master plan includes pre-K, elementary, intermediate, and high school facilities, and common facilities to support these programs. The master plan also provides facilities for an agricultural program, which Connections currently does not have, but would like to implement with the relocation to the Kaūmana property.

From an overall design concept, the proposed campus is intended to be a school within a forest. Planning and architectural design concepts take advantage of the site's natural elements and aim to reduce disturbance to the natural surroundings, in particular the native ‘ōhi‘a forest that covers the upper parcel of the project site. Buildings would be small in scale and organized in clusters of single-story buildings to create a more village-like atmosphere, rather than a few large structures. Buildings would also be elevated off the ground to minimize the amount of grading and land modification necessary.

The proposed campus is described in further detail below, and the conceptual campus layout and site sections are shown in Figures 2-3 through 2-8.

<u>Lower Parcel</u>

All major school facilities are proposed to be located within the lower parcel. Major school facilities include the elementary, intermediate and high school classroom buildings, the administrative center, the library/resource center, the kitchen/dining facility, a gymnasium/multi-purpose building, greenhouses, a 6-horse barn, a maintenance building, a 30-person dormitory, a

caretaker's residence, and a pre-K building. Refer to Figure 2-5 for a site plan showing the locations of these individual facilities within the lower parcel. These facilities would support a projected 25 pre-K students, 167 elementary students, 107 intermediate students, and 107 high school students. The dormitory would serve a maximum of 30 non-traditional students. Connections envisions these non-traditional students to be visiting or exchange type students that would stay at the school for limited periods (e.g., 1 to 2 weeks at a time). Thus, the dormitories are not likely to be continuously occupied throughout the year.

As laid out, the school facilities nearest to the Kaūmana Cave are located over 200 feet away. Buildings would be single story, small in scale and oriented to take advantage of natural lighting and ventilation. Buildings are intended to be of lightweight construction; most would be elevated off the ground and supported by shallow concrete pier foundations. The buildings are linked by a curved spine, which would primarily serve as a pedestrian mall, but would also be used as a service and emergency access road. The intention is to keep site grading to a minimum, but some grading would be required for roads, parking areas, some building pads, and to control surface runoff and drainage.

The campus would have a single vehicular access from Edita Street. Existing vegetation would either remain or be replanted with different varieties of trees to provide a visual buffer at the entrance of the access road, which would purposely limit visibility of the campus from Edita Street.

The access road would first lead to the campus' main parking lot, which has a capacity of 88 stalls.[1] The Pre-K program and the dormitory would be located to the north of the main parking lot. The dormitory would consist of two buildings, one for female occupants and one for males. The pre-K facility would have its own facility, including its own defined outdoor play area, that is located away from the elementary, intermediate and high school facilities. As mentioned earlier, Connections currently does not have a Pre-K program, but could implement one at some point in the future if there is sufficient interest. The Pre-K program is not a high priority item, and if implemented would likely be the last facility to be constructed at the project site.

At the end of the access road would be the vehicular roundabout. Surrounding the roundabout are the gymnasium/multi-purpose building to the west and the administrative center to the northeast. The gymnasium would be approximately 10,500 square feet and the administrative center about 3,000 square feet in size.

From the roundabout to the north is a branch road that leads to a secondary parking lot, which has a capacity of 52 parking stalls. This parking lot would mainly serve the high school students. The high school facilities are located in the northern part of the campus, adjacent to the high school parking lot. The high school consists of five classrooms; a faculty center; a media lab; the art, music, and science complex; two greenhouses, and a play field. Classrooms would be flexibly-designed so that they can be divided into smaller classrooms on an as needed basis. Close to the high school greenhouses are the horse barn and the maintenance shop. A small road

[1] Parking lot design and stall counts are based on preliminary rough square footages. During the design development phase of the project, facility square footages will be better defined and stall counts would be adjusted as needed to comply with county code.

would connect the high school parking lot to the horse barn and a small loading and parking area would be provided to serve the barn.

Leading eastward from the roundabout is a curved pedestrian mall/service road that extends to the north of the campus. The path would mainly serve as a pedestrian mall; however, it would double as a service and emergency access road. A dedicated covered pedestrian walkway would run parallel to the mall. The mall would provide primary access to the elementary and intermediate school facilities, the kitchen/dining facility, and the library/resource center. The elementary school consists of seven classrooms, a media lab, and a faculty center; the intermediate school consists of four classrooms, a media lab, and a faculty center. Both the elementary and intermediate programs would share the same art and music classrooms, and the two greenhouses.

The overall layout of the campus is organized in a way that the schools' classrooms and facilities are placed surrounding the common facilities, such as the library/resource center and the kitchen/dining facility. This layout would provide some level of separation between the elementary, intermediate, and high school programs, but also keep the facilities of the campus close together as a whole. The total gross square footage of the campus facilities would be approximately 90,000 square feet.

Upper Parcel

While no major school facilities are being proposed for the upper parcel, Connections would still like to use it support their educational program. Thus, a walkway is being proposed for the upper parcel to provide access and viewing opportunities within the forested area. The walkway would not be constructed at grade, but elevated on posts, roughly 4 to 5 feet above grade. The walkway would be located beyond the 100-foot buffer surrounding the cave and would be a lightweight structure with shallow footings or pier foundations. Connections intends to fence off the property and will control access to the walkway and the upper parcel. This walkway is the only structure being proposed for the upper parcel.

For pedestrian safety, a painted crosswalk, including signage, would be delineated on Edita Street connecting the lower parcel driveway to the walkway entrance on the upper parcel.

Connections also intends to use portions of the upper parcel for reforestation projects. These projects would reintroduce, within the existing ʻōhʻia forest, some of the native species that historically grew in the area such as koa and hapuʻu fern. It is currently estimated that roughly 20 acres of the upper parcel would be used for reforestation projects. This acreage is subject to change once on-the-ground conditions can be assessed and suitable reforestation areas identified.

Sustainability

Connections plans to construct a green school and envisions that their new campus be a model of sustainable development and design. At a minimum, the school will achieve a Silver rating under the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, but will strive for a higher LEED certification if the opportunities present themselves and are economically feasible. The campus' design would incorporate ways to reduce the school's carbon footprint. Alternative and sustainable energy sources, such as wind and solar power, as

well as sustainable strategies and technologies for energy and water use, would be integrated wherever feasible. Examples of sustainable strategies and technologies for energy and water use being considered in the preliminary conceptual plans include the following:

- Temperature Control – Building orientation would help to regulate internal temperatures. The majority of buildings would be oriented to minimize morning and evening heat gain. South facades would be properly shaded using energy and heat reflection tools, such as strategically placed large eaves and overhangs, landscaping, light shelves, and vertical louvers. Roofs would be insulated and light in color to minimize heat absorption.
- Air Movement – Buildings would be constructed to maximize utilization of natural air movement for cross-ventilation, providing slightly larger air outlets then inlets, employing stack ventilation strategies and clerestory windows, cupola (barn), thermal chimneys, ridge vents, and ceiling fans.
- Lighting – North light would be maximized through the use of clerestory windows and glare minimized through the use of shading devices and large overhangs. Translucent structural roofing could also be used to provide additional natural light penetration.
- Energy Production – Use of high-efficiency, unobtrusive, photovoltaic laminates (solar panels) would be used, and southern roof exposure angles would be oriented for maximum solar gain.
- Water Efficient Fixtures – Use of water efficient fixtures such as waterless urinals, high efficiency toilets or low/dual-flush toilets would help reduce the potable water demand. Further reducing the demand for potable water would be the utilization of captured rainwater for toilet flushing.
- Rainwater Collection – The campus would include a rainwater collection system designed to capture rainwater from building rooftops for use in toilets, janitorial purposes, and for the needs of the agricultural program.
- Use of Recycled Water – Use of recycled water for irrigation and other non-potable water uses as allowed by applicable regulations.

Landscaping

For the upper parcel, no landscaping is proposed as it is Connections' intention to maintain the existing native ʻōhiʻa forest. For the lower parcel, minimal landscaping is proposed. Excluding the built-up and cultivated areas, the existing vegetation would serve as the primary landscape material. There could be some replacement of existing vegetation with other varieties of trees and shrubs, particularly near the Edita Street side of the lower parcel and along the driveway leading into the campus. As well, Connections intends to clear the evasive species growing within the lower parcel, which could be replaced with outplanted native species.

Where intentional landscaping would be provided, such as in the immediate vicinity of buildings, native plants that are well-suited to the localized environment and that require minimal maintenance would be used. There would also be some manicured, grassed areas such as the play fields.

Agricultural Program

With the new campus, Connections would like to incorporate an agricultural program into their academic offerings. The agricultural program would provide students with hands-on experience in sustainable agricultural practices and would emphasize small sustainable agricultural techniques. An area of approximately 17 acres is allocated for the agricultural/cultivation area. The agricultural area comprises the eastern portion of the lower parcel. Agricultural program facilities would include greenhouses, a 6-horse barn, and cultivated gardens. Cultivated gardens would be limited to the lower section of the property, which is currently populated largely by non-native trees and weeds. Cultivated crops may include vegetables, taro, fruit trees, native plants, and ornamental plants. The agricultural program may also include some livestock (e.g., chickens, goats, pigs, and horses).

Infrastructure

Electrical, telecommunication and potable water infrastructure is available to the project site. As stated earlier, the project will achieve, at a minimum, LEED Silver certification. A higher certification will be striven for, if financially feasible. Project features to achieve LEED certification would reduce demand for electricity and potable water. These include the use of photovoltaics and an extensive rainwater catchment system. To support the rainwater catchment system, a minimum of two cisterns or tanks—a catchment tank and a reservoir tank—would be needed. These tanks are shown conceptually on Figures 2-3 and 2-5. During design development the actual number and size of these tanks would be determined based on amount of captured rainfall to be collected and the amount of reserves needed to support the campus' non-potable water uses.

The Kaūmana area is not served by a municipal wastewater system. Therefore, like all the surrounding properties, Connections would have to provide its own wastewater system as part of the project. A biological wastewater treatment system is being considered and likely will be implemented for the school. One well-known and established system is called the "Living Machine." This type of system is Connections' preferred option over a conventional septic system. Biological treatment systems are on-site, environmentally friendly systems that mimic the cleansing functions of wetlands and consist of a settling tank and series of tanks/systems (underground or aboveground, depending on the specific design of the system) that progressively clean the wastewater. Bacteria, plants, and other organisms, such as snails and fish, are used to break down and digest the organic pollutants. It is an odor free process. The end product is R-2 quality water that can be reused for non-potable uses such as some agricultural irrigation or can be released safely back into the environment. On the campus site plan, an approximately 12,000-square-foot area has been set aside for the biological treatment system. This area is shown by the dashed rectangle on Figure 2-5. This area is based on early rough estimates of wastewater volumes. However, during design development, estimated volumes would be refined as they can be based on fixtures counts and also take into account water reduction features included in the project. Thus it is expected that this set aside area would be substantially smaller in size than what is shown on the conceptual master plan.

2.1.3 Project Phasing and Construction

Full build out of the new school is projected to be completed by the year 2022. However, the timetable for development is difficult to determine, as it is highly dependent on the ability of the

school to obtain the necessary financial resources. Given the amount of money required to develop the entire property and construct all of the school's facilities, Connections proposes to develop the proposed project in phases, with each phase being initiated as funds become available. The sequence of each phase is based on a set of priorities developed by the school to meet its curriculum and operational needs. The proposed project phases and development schedule are presented below.

Phase 1 – Construction of agricultural facilities (2011)
Phase 2 – Construction of dormitory and caretakers residence (2012)
Phase 3 – Construction of high school facilities (2013).
Phase 4 – Construction of elementary/intermediate school facilities (2017-18).
Phase 5 – Construction of gymnasium (2019)
Phase 6 – Construction of pre-Kindergarten facilities (2022)

2.2 Alternatives Considered

In addition to the Proposed Action, No Action and three alternative design options were evaluated in the context of meeting the project's purpose and need. The alternative design options incorporate different site utilization/layout configurations. The alternative designs are described in further detail below.

2.2.1 Alternative 1 (Linear Split Campus)

The Upper Campus would house the elementary and intermediate schools, the pre-K program, the main administration building, the main cafeteria and kitchen, and a gymnasium/multi-purpose building. The pre-K program will accommodate approximately 25 students, the elementary program 167 students, and the intermediate program 107 students. Of the 37 acres which comprise the Upper Campus, approximately seven acres would be built-up including roadways, parking and buildings.

As shown in Figure 2-10, facilities on the Upper Campus would be laid out linearly, stretching across the length of the property. Buildings will be situated along a pedestrian spine with the main administrative center, the gymnasium and the cafeteria/kitchen closest to the main parking lot and Edita Street. Further up the property will be the pre-Kindergarten facilities, followed by the elementary school facilities and the intermediate school facilities at the top of the Upper Campus.

The Upper Campus will have two driveways on Edita Street, which would provide the primary vehicular access to the Upper campus and would service the main parking lot. A secondary access is proposed off of Kaūmana Drive at the upper tip of the property. This access would be limited (i.e., gated) and used primarily during the before and after school rush to accommodate traffic to/from the Puainako Extension and upper Kaumana Drive. It would also be used as secondary access/egress for emergency purposes. In addition to the main parking lot, four small parking lots would be provided to facilitate deliveries and service to the buildings located at the higher end of the Upper Campus.

The Lower Campus would house the high school, dormitory, agricultural program facilities, caretaker's residence, grass field and a maintenance shop. The total built-up area, which includes roadway, parking, buildings and a grass field encompasses approximately 5.5 acres. An area of approximately 20 acres of the Lower Campus is allocated for the agricultural/cultivation area.

While the Upper Campus utilizes a linear layout, the Lower Campus is based on a centralized layout. A central courtyard scheme is used as the key site planning element and provides the focal area for outdoor activities and gathering. This pattern promotes campus security as the courtyard creates an enclosed and easily supervised space, where access can be controlled and activities monitored.

2.2.2 Alternative 2 (Centralized Split Campus)

Similar to the Alternative 1, Alternative 2 utilizes a split campus layout with the pre-K, elementary and intermediate programs located on the Upper Campus and the high school located on the Lower Campus. The total developed area of the campus would be approximately 33 acres consisting of an 18-acre Upper Campus and 15-acre Lower Campus (Figure 2-11).

Development on the Upper Campus is situated close to Edita Street and comprises approximately 18 developed acres. The Upper campus would have two driveways on Edita Street, which lead to the main parking area fronting the gymnasium and administration buildings. A service road that branches off from the eastern driveway and follows the property's southeastern boundary would provide service access to the kitchen, the intermediate school's facilities, the library, as well as two smaller parking areas.

The Upper Campus would accommodate the pre-K, the elementary and the intermediate schools. The main administrative office and faculty center would be located close to the drop-off area and main parking lot. Another main facility located at the entrance to the Upper Campus is the gymnasium. The cafeteria and main kitchen are located near the gymnasium connected by a large shared lanai. Close to the cafeteria are the intermediate school classrooms. Opposite the intermediate school, across the courtyard, are the elementary and pre-K classrooms. Located on the western side of the central courtyard are specialized classrooms and library/media resource center. These facilities are shared by the elementary and intermediate programs.

The Lower Campus would have a single driveway off of Edita Street, with two main parking lots fronting the school. A roundabout is provided to facilitate traffic flow and enhance the school's sense of entry. A service roadway branches off from the main vehicular access, runs along the parcel's northwestern boundary and would serve the kitchen, dormitory, caretaker cottage, and maintenance building.

The Lower Campus would accommodate the high school, dormitory, and agricultural program. The satellite administrative/faculty center is placed at the western side of the courtyard, fronting the drop-off and main parking. The classrooms are located on the southern side of the courtyard, while the library is situated on the eastern end. The cafeteria/kitchen and dormitory are placed on the northern side of the courtyard. The large land area east of the high school facilities is allocated for the agricultural program.

Under Alternative 2, all of the school facilities in both the Upper and Lower Campus' enclose central courtyards, which would function as the gathering space for outdoor activities. Advantages of the centralized layout are that it can enhance security as access points can be controlled and outdoor activities can be easily monitored. Alternative 2 would require more intensive landscaping and would not provide as much buffer area between the school and the adjacent properties

2.2.3 Alternative 3 (Consolidated Campus)

Alternative 3 adopts a more compact layout with the majority of the school's facilities consolidated within the Upper Campus. All main functions including the elementary school, intermediate school, high school and dormitory are grouped together and located within the Upper Campus, while the agricultural program would be separated and placed within the Lower Campus. The total developed area of the campus would be approximately 23 acres consisting of a 20-acre Upper Campus and 3-acre Lower Campus (Figure 2-12).

Alternative 3 utilizes a central courtyard scheme. With the exception of the gymnasium, all facilities serve to delineate and enclose the central courtyard. This large courtyard provides a focal point for outdoor activities and a protected gathering space. The administrative/faculty center is located on the northeastern side of the courtyard, close to the drop-off and main parking lot, so it can function as the school's access point. The elementary and intermediate schools, along with their shared specialized classrooms, form the northwestern edge of the courtyard. The library is placed on the western side of the courtyard. The high school classrooms are clustered along the southern side of the courtyard, while the dormitory facilities are located on the southeastern side. The cafeteria and kitchen are located on the eastern side of the courtyard between the dormitory and gymnasium.

The Upper Campus has one main vehicular access from the Edita Street. Two main parking lots front the school and traffic flow is facilitated by a roundabout, which also provides a drop-off area. A service roadway branches off from the lower parking lot and runs along the parcel's southern boundary. This roadway and small parking lots provide service to the cafeteria, kitchen, dormitory, high school, and library/resource center.

The layout of the Lower campus is quite simple, with only a single structure and greenhouses to serve the agricultural program. The structure is located on the western end of the Lower Campus and is accessed by a roadway from Edita Street. A small parking lot is provided to service the agricultural program. The rest of the property is allocated for cultivation.

An advantage of the consolidated site layout is that it allows for more efficient development and would facilitate security and monitoring as the entire school would be accessed via a single entry point. However, a major disadvantage of this alternative is that it would require more intensive landscaping. The non-linear layout also would not provide a natural/forested buffer area resulting in the school's buildings and facilities being situated much closer to adjacent private residential properties and public roadways.

2.2.4 Alternative 4 (No Action Alternative)

Under the no action alternative, Connections would continue to operate and house its elementary and intermediate schools in the Kress Building. The high school is currently located in facilities which must be vacated soon due to leasing issues. Thus, the school needs to find a new facilities to accommodate its high school operations. Once a new lease location is found, Connections would be faced with continued high rental costs in order to house its high school program. Additionally, the temporary nature and uncertainties associated with the leasing of a property could result in the interruption of services to its students and their families. Therefore, the No Action Alternative is not considered acceptable, as it would not meet the long term operational and curriculum needs for Connections.

2.3 Alternatives Considered and Eliminated from Further Analysis

2.3.1 Selection Criteria

In selecting a site for their new campus, Connections applied several selection criteria. Because the school's long-term goals included adding an agricultural program, the property had to be large enough to accommodate an approximately 20-acre cultivation area. The University of Hawai‘i at Hilo has a 20-acre demonstration farm, thus twenty acres was identified as a target size for Connection's demonstration farm. Therefore, the property needed to have enough acreage to accommodate school facilities plus provide another roughly 20 acres for cultivation. Other criteria included surrounding land uses that are compatible with a school and the agricultural program; sufficient vehicle access, while staying away from major roadways; availability of public transportation, and availability of utilities.

2.3.2 Alternative Site Locations

The applicant does not own another suitable site and the land costs involved in acquiring a suitable site could be very high considering the current market. Connections conducted an extensive search of possible properties on which to develop a new school campus and found that the Kaūmana project site was the only acceptable site within the school's service area that satisfied its selection criteria. In addition, the Kaūmana project site was uniquely suited to support both an agricultural program and a conservation/forestry program.

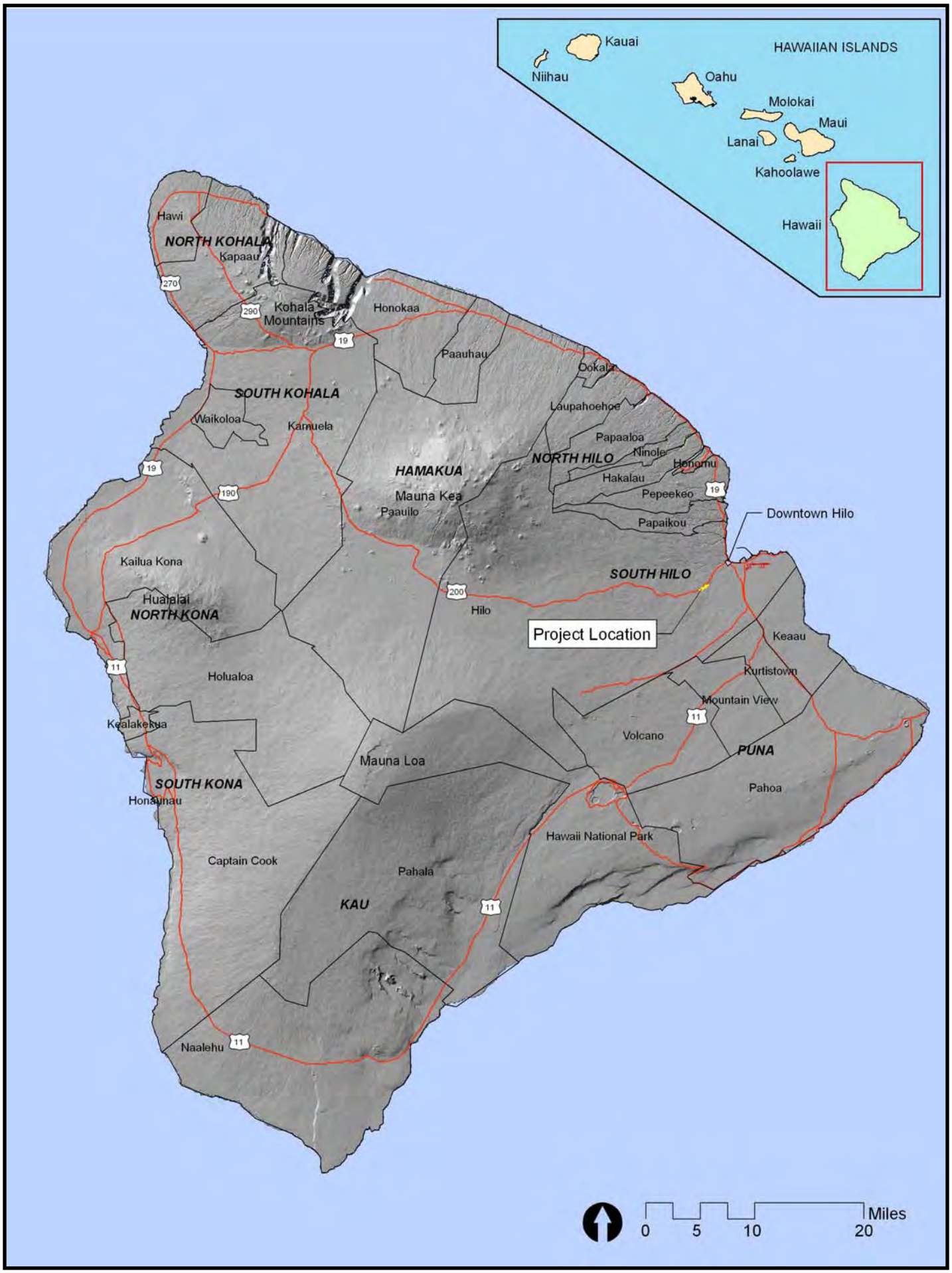
Connections engaged DLNR to discuss the possibility of leasing state land on which to develop their new campus. DLNR forwarded a list of properties in the Hilo area for consideration by the school. Table 2-1 below lists the properties that were considered, but rejected because they did not meet the school's needs.

Table 2-1. TMKs Considered for New Campus Location

TMK	Land Area	Reason for elimination
2-4-012:009	14.37	Too small; limited access
2-4-012:010	3.99	Too small; limited access
2-5-003:020	16.29	Too small; shape of parcel not conducive for school
2-5-003:021	23.96	Too small; shape of parcel not conducive for school
2-5-006:003	28.24	Limited access; powerline easement running through property
2-5-006:142	5.76	Too small, shape of parcel not conducive for school, powerline easement running through property
2-4-001:010	13.58	Too small; fronts onto a major, high-speed road
2-4-001:011	6.19	Too small; fronts onto a major, high-speed road
2-4-003:012	159.12	Too large
2-4-003:026	102.00	Too large
2-4-003:027	6.8	Too small; no access
2-4-003:050	8.88	Too small
2-4-006:034	319.60	Too large
2-4-006:035	45.77	No access
2-4-076:036	41.2	Too far from bus route (≈ 1.3 miles)

2.3.3 Deferred Action

This alternative would delay the process of identifying, securing, and developing a site for the construction of a new campus. This would delay the lease agreement process and in turn, delay the transfer of the proposed project site to the Applicant. In addition, there would likely be an increase in planning, design, and construction costs in the future that would be financially burdensome for the applicant and could potentially preclude development of a new campus altogether.



PROJECT LOCATION ***FIGURE 2 – 1***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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PROJECT VICINITY ***FIGURE 2 – 2***

Final EA – Connection Public Charter School Kaumana, South Hilo, Hawai'i

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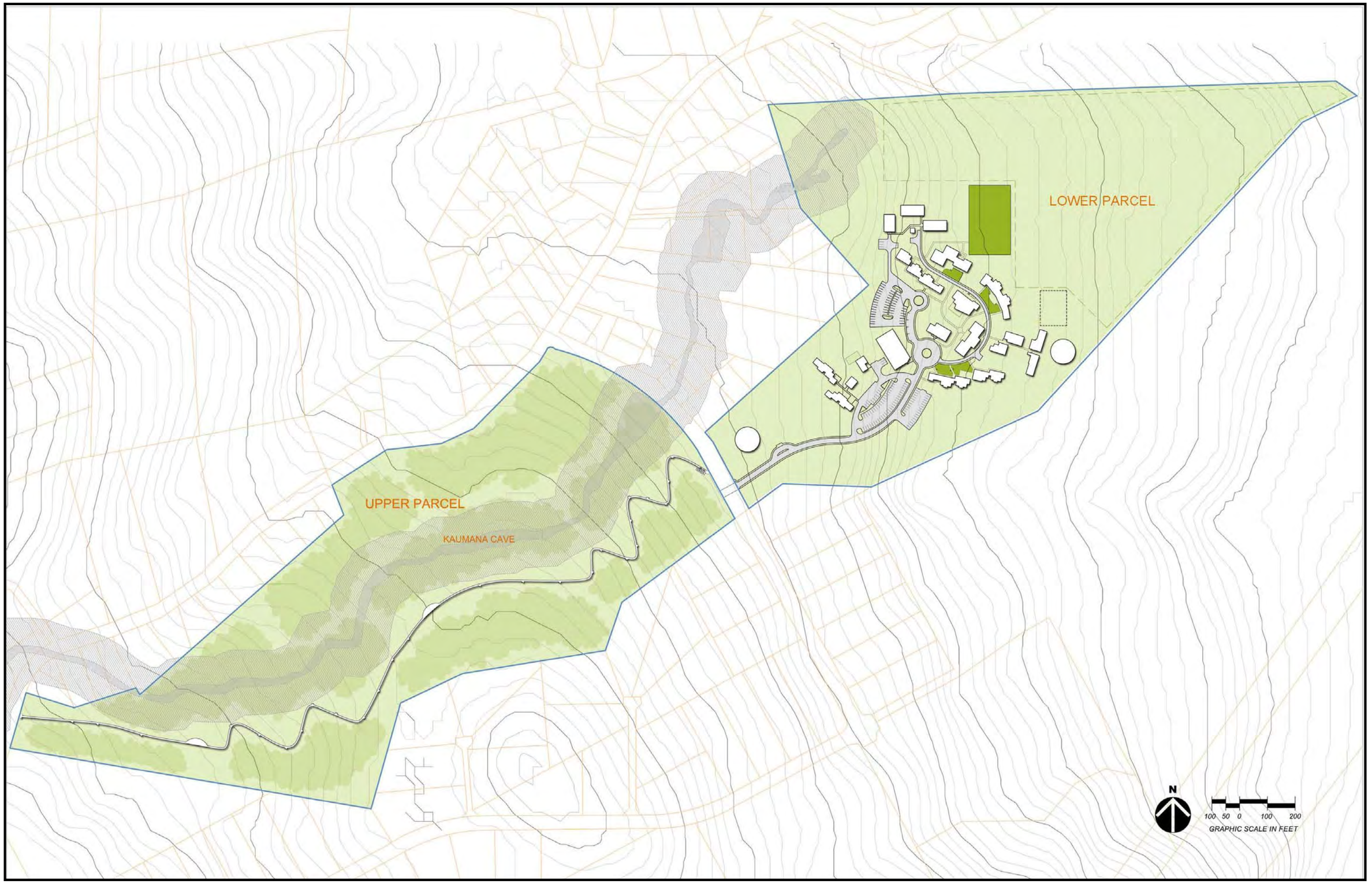

PROJECT SITE PLAN ***FIGURE 2 – 3***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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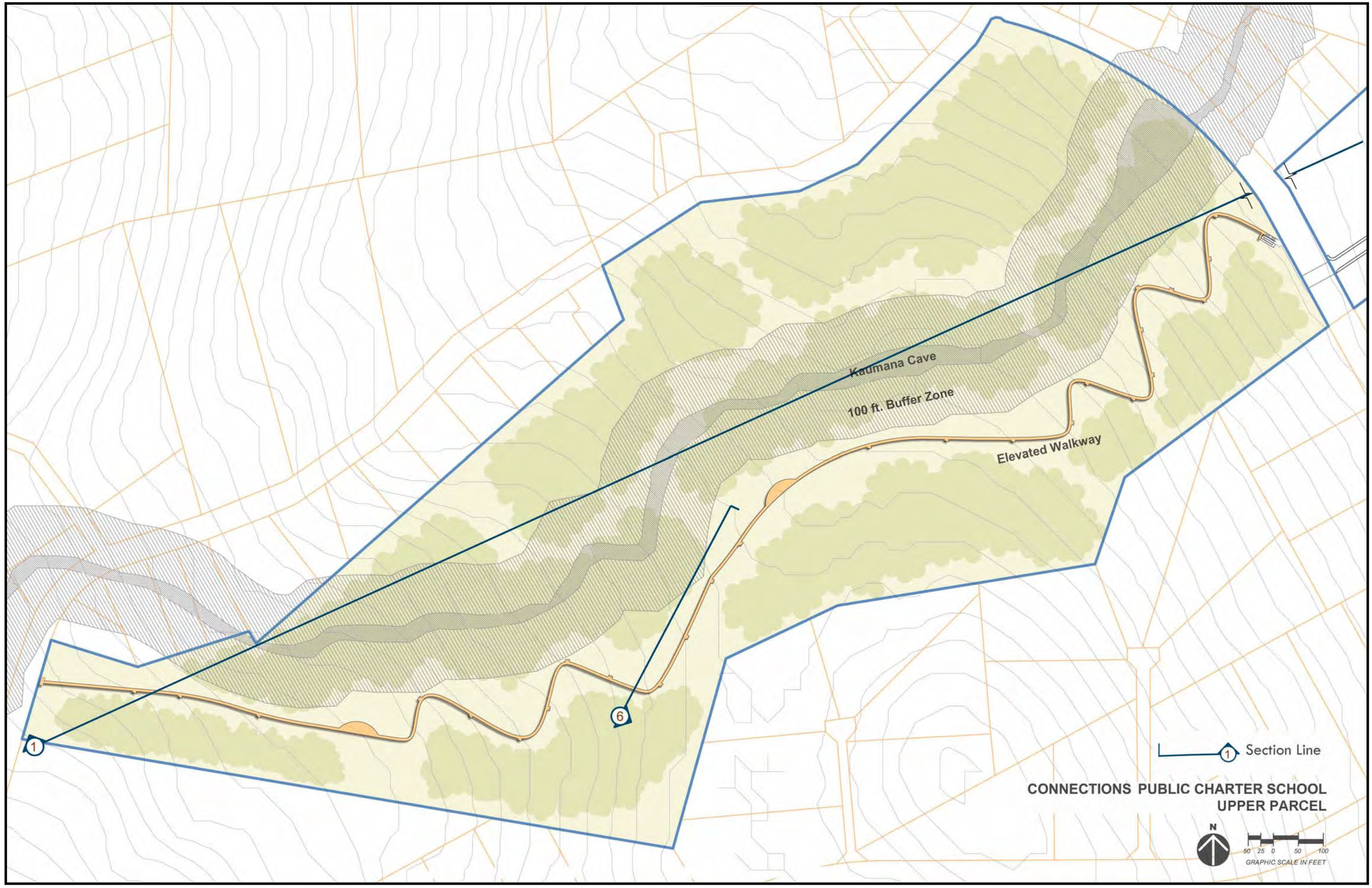

UPPER PARCEL ***FIGURE 2 – 4***

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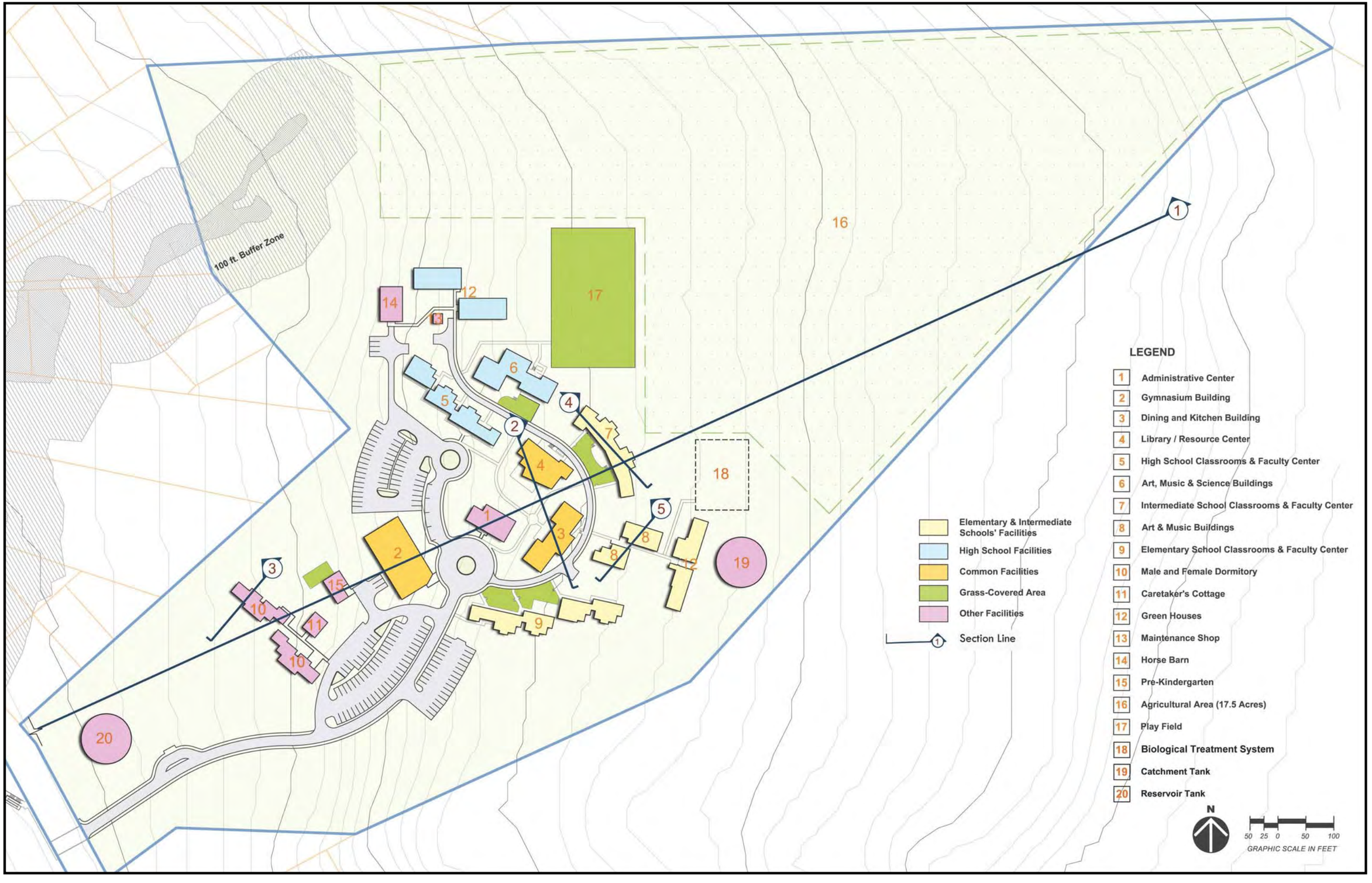

LOWER PARCEL

FIGURE 2 – 5

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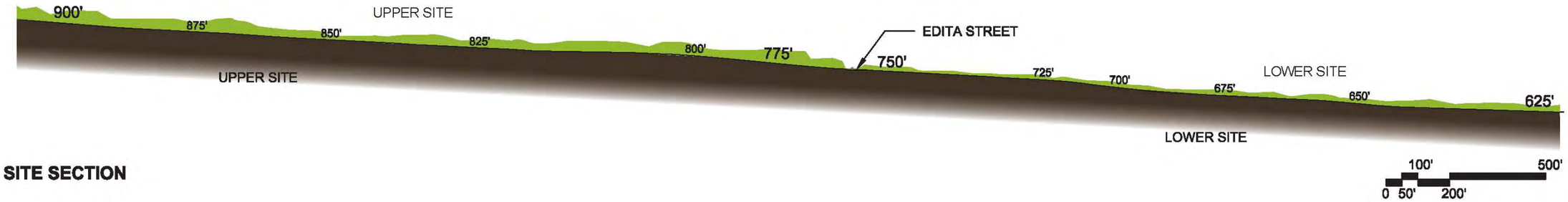
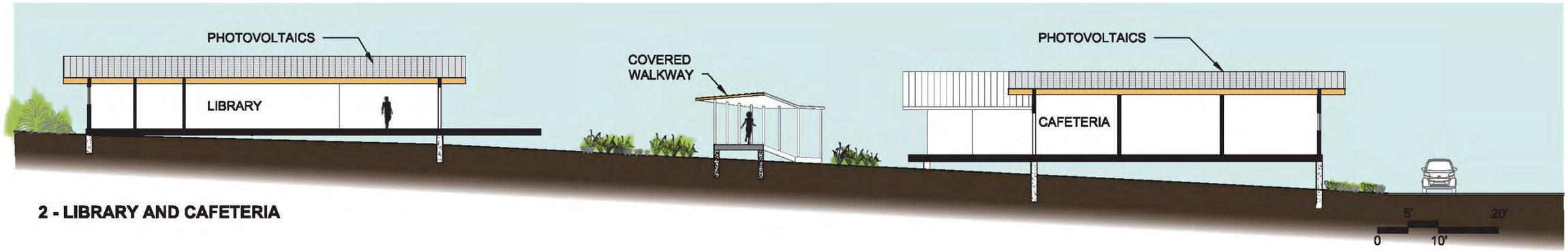
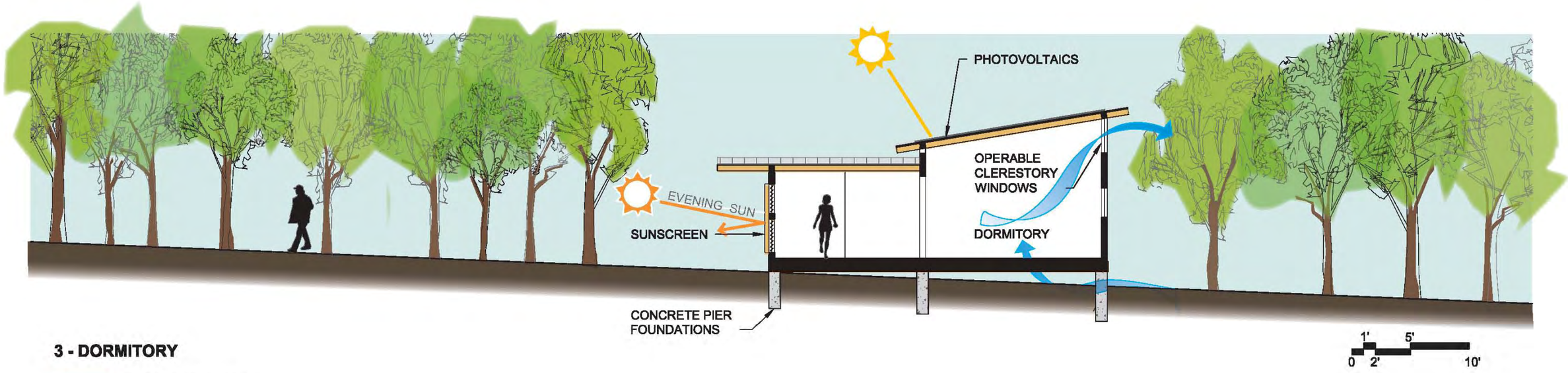


1 - SITE SECTION



2 - LIBRARY AND CAFETERIA



3 - DORMITORY

Urban Works

CONNECTIONS
PUBLIC CHARTER SCHOOL

BUILDING SECTIONS

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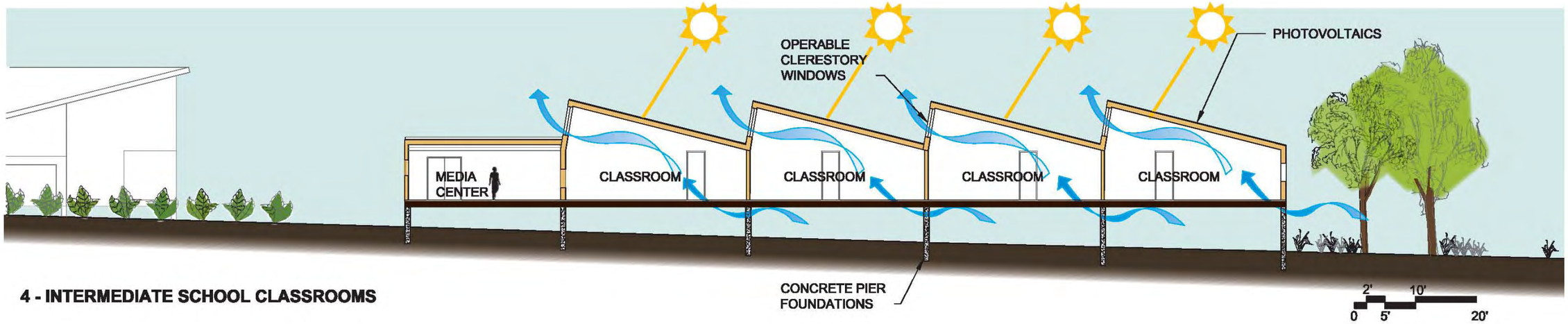
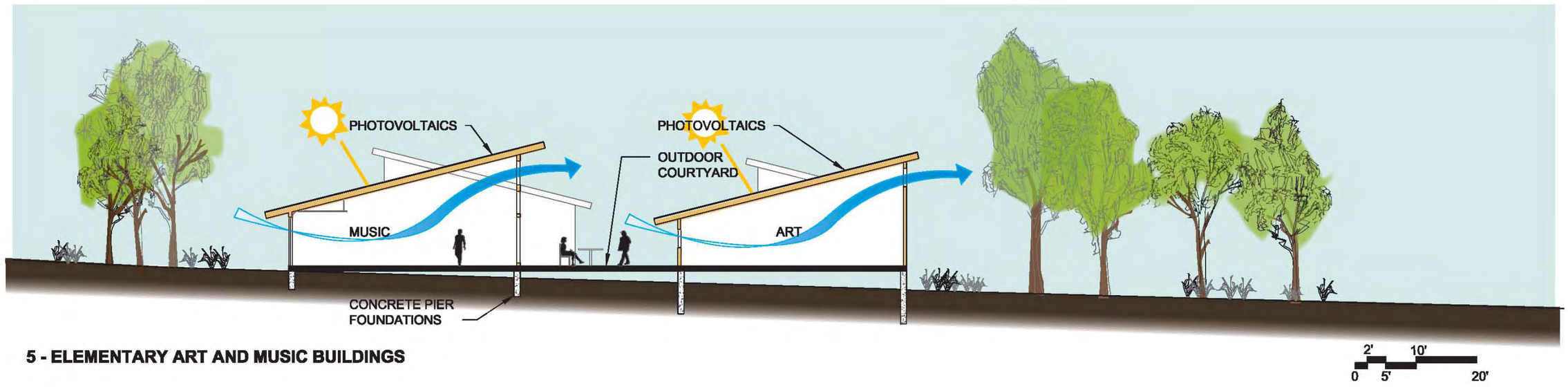


4 - INTERMEDIATE SCHOOL CLASSROOMS



5 - ELEMENTARY ART AND MUSIC BUILDINGS

Urban Works

CONNECTIONS
PUBLIC CHARTER SCHOOL
BUILDING SECTIONS

SECTIONS 4 AND 5

FIGURE 2 – 7

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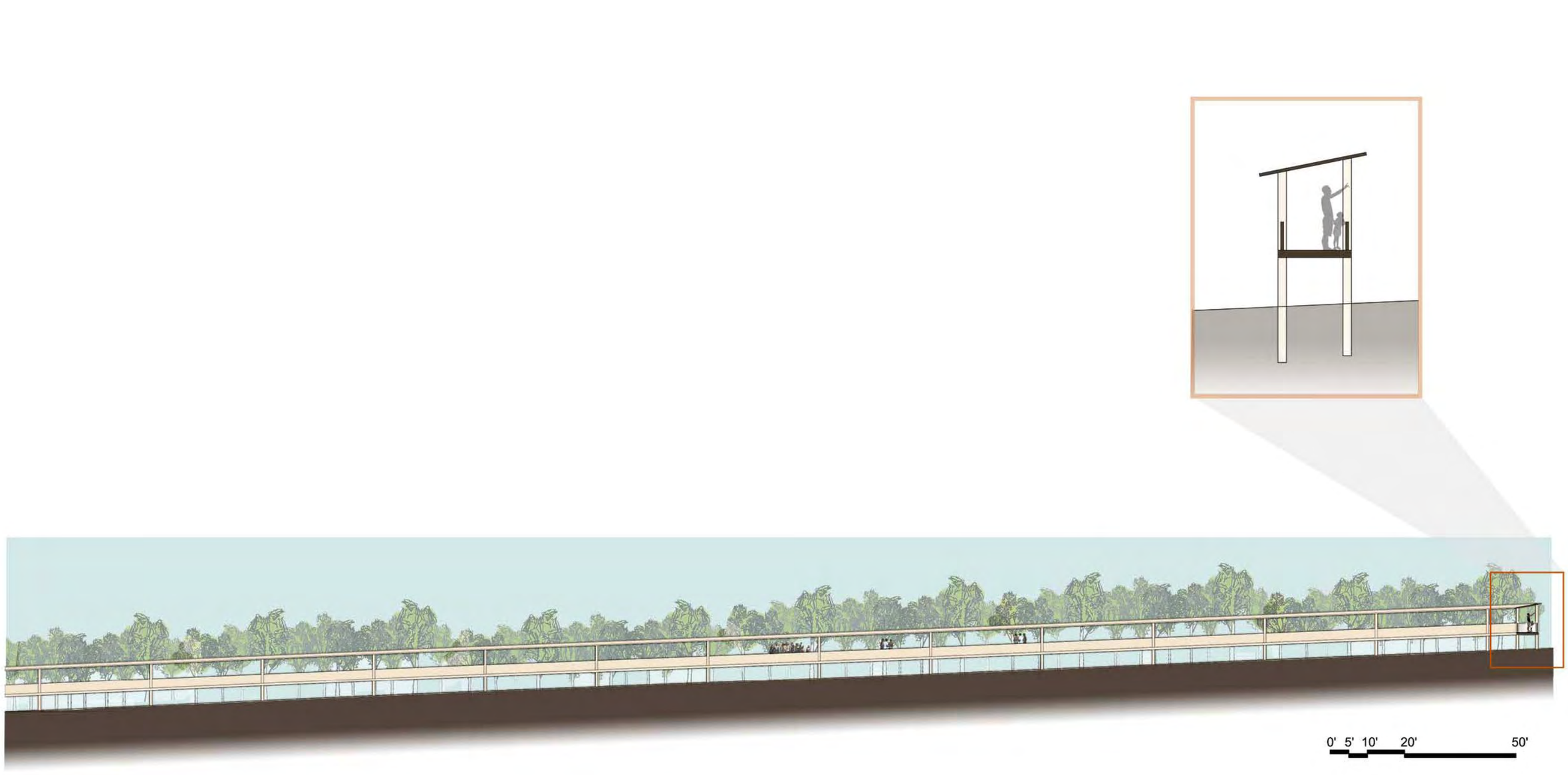

6 - UPPER PARCEL SITE SECTION

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3-D SITE RENDERING ***FIGURE 2 – 9***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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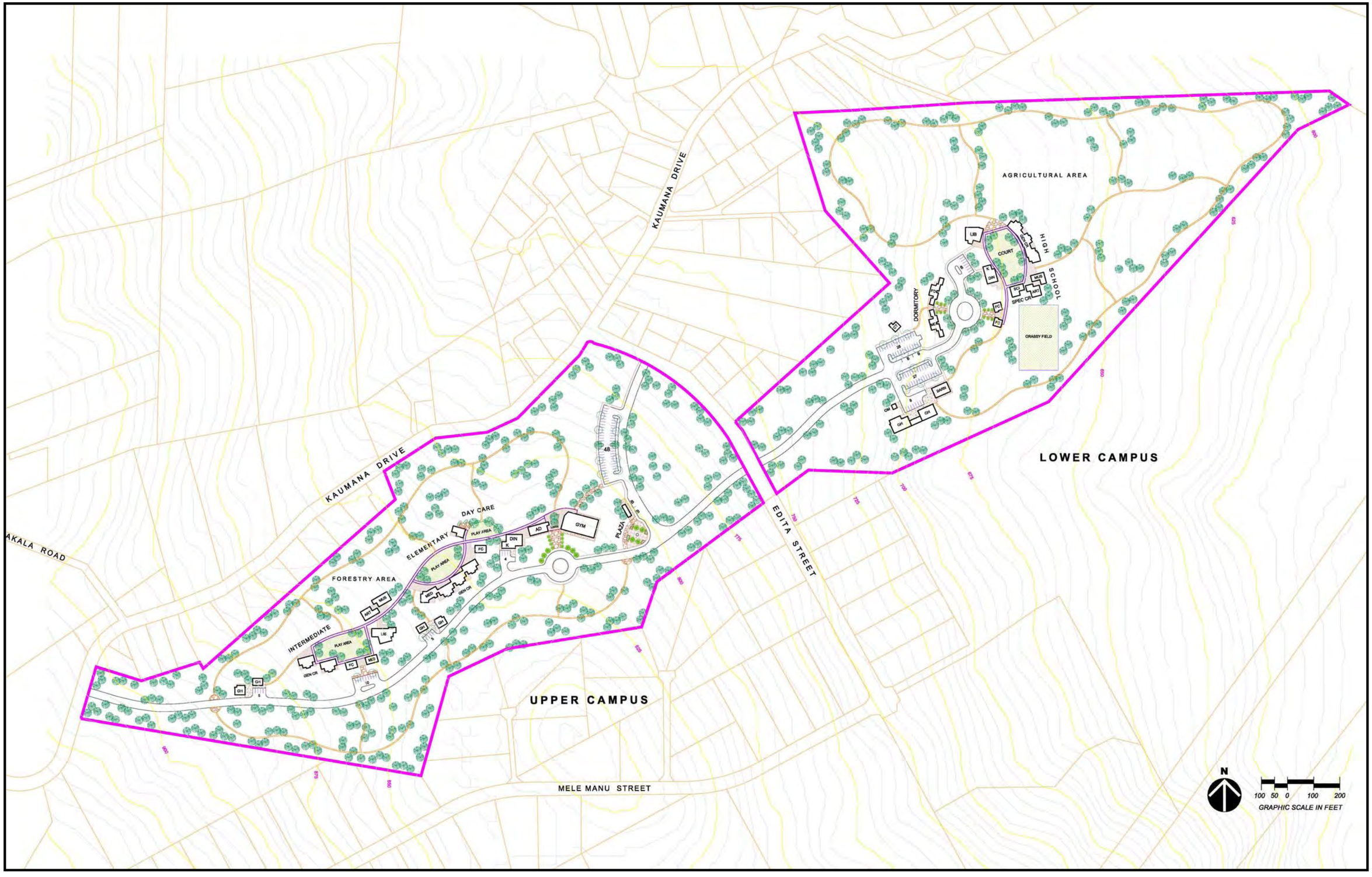

ALTERNATIVE 1

FIGURE 2 – 10

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ALTERNATIVE 2

Final EA – Connections Public Charter School

FIGURE 2 – 11

Kaumana, South Hilo, Hawai'i

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ALTERNATIVE 3

Final EA – Connections Public Charter School

FIGURE 2 – 12

Kaumana, South Hilo, Hawai'i

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3.0 AFFECTED ENVIRONMENT, POTENTIAL ENVIRONMENTAL CONSEQUENCES AND MITIGATION

3.1. Topography, Geology, and Soils

Topography

Hilo is nestled at the end of an ocean bay where young lava flows from Mauna Loa meet older flows from Mauna Kea. Overall, the area slopes toward the sea and towards the region where the Mauna Kea and Mauna Loa lava flows meet. Superimposed on the slopes are the undulating topographic highs and lows typical of lava flows.

Elevations within the project site range from 600 to 750 feet above mean sea level (msl) in the lower (eastern) parcel and 750 to 900 feet above msl in the upper (western) parcel. The terrain gently slopes from southwest to northeast. The project site has an average slope of 6.13 percent.

Geology

The areas above Hilo have been covered by successive lava flows from Mauna Loa, some of which have in-filled the area between the slopes of Mauna Loa and Mauna Kea. The project site rests entirely on lands covered by the 1880-1881 Mauna Loa lava flow. This narrow tongue of pāhoehoe lava originated on the slopes of Mauna Loa and flowed northeasterly toward Hilo, halting just two miles short of the town. The lavas of the 1880-1881 flow are Kau Basalts and consist of relatively smooth, glassy surfaced pāhoehoe that has been distorted by uplifts and pressure fractures (Wolfe & Morris, 1996).

Portions of the project site are underlain by a lava tube segment that is part of the Kaūmana Cave system. Kaūmana Cave is discussed in greater detail in Section 3.2 below. Lava tubes develop as underground conduits of magma within a lava flow transports the molten magma for long distances (USGS, 1995). As the molten pāhoehoe surface flows cool and crust over forming a hardened outer surface layer, the more insulated, hotter middle portions of the flow continue to move down hill beneath the solidified crust. As the supply of fluid magma decreases, the level of its residual subsurface flow gradually drops as it drains from its primary pathways. What remains are pockets of open space between a ceiling and floor of solidified magma, forming underground cavities and sinuous caverns. Aside from Kaūmana Cave, it is possible that there may be other unknown lava tubes that underlie the project site.

Soils

Soils covering the project site are thin to nonexistent because the area was covered with lava basalt flows only 128 years ago. The majority of soil within the project area is classified as *pāhoehoe lava flow* (rLW) with only a small area in the northernmost portion of the site being comprised of *keaukaha rocky muck* (rKFD) (Sato, et al., 1973) (refer to Figure 3-1).

New pāhoehoe has a glassy, smooth surface and a high porosity that allows water to quickly percolate underground. These are not ideal conditions for soil formation. Soil slowly develops by the breakdown of vegetation and lava debris, which form small pockets of soil in cracks and crevices. Over time, as more soil slowly forms and accumulates, dense vegetation consisting of

trees, ʻōhelo berry, aʻaliʻi and Pacific false stag horn or ʻuluhe will develop in areas with high precipitation (Sato, et al., 1973).

The Keaukaha Rocky Muck soils in the northern portion of the site are well-drained, thin organic soils that overlay the pāhoehoe lava bedrock. A typical profile contains soils that are dark in color and acidic due to the accumulation of decomposing vegetation and high rainfall (Sato, et al., 1973). The soil covering the pāhoehoe lava is rapidly permeable, runoff is medium and the erosion hazard is slight.

3.1.1. Potential Impacts

PROPOSED ACTION

During construction activities such as clearing, grading, and excavation for utility and drainage improvements, soils and topography would be altered in the areas to be developed. Exposed soils are susceptible to erosion, especially during periods of heavy rain. Wind erosion can also result in some unavoidable and negligible loss of soil. Silty runoff is another possible impact that requires mitigation. All of these disturbances would be localized, short-term, and temporary.

Prior to construction activities the contractor would develop and implement a site-specific best management practices (BMP) plan that would identify the most effective erosion, sedimentation, runoff and dust control measures to reduce the amount of soil and sediment transport from construction activities. With adherence to BMPs, no significant adverse short-term, direct or indirect impacts to topography or soils are anticipated as a result of the Proposed Action.

The risk of damage to school facilities and injury to construction workers and school personnel caused by lava tube roof collapse would be minimized by siting and limiting major development to an area of the lower parcel that is not underlain by known lava tubes. Precautionary measures would be implemented, as warranted, to minimize the potential for encountering unknown voids in areas slated for development.

In the long-term, Connection's building design concept would minimize the disruption of soils and topography at the project site. The project would incorporate and maximize the use of the existing natural landscape into the campus design, leaving much of the site undisturbed. From a conceptual approach, the design involves the construction of small-scale, elevated structures supported by shallow concrete pier foundations (Figures 2-6 through 2-8). Use of the concrete pier foundations will keep floor elevations above the existing grade and will greatly minimize disturbance to soils and topography.

ALTERNATIVES

For all alternatives, the potential impacts to topography and soils would be similar to the Proposed Action. The only difference is that areas on both the upper and lower parcels would be disturbed, thus resulting in a greater surface area that is disrupted. Under the No Action alternative, topography and soils would not be affected.

3.1.2 Mitigation Measures

Where warranted, site-specific geotechnical surveys would be conducted to determine the potential for subsurface voids beneath areas to be developed. If subsurface voids are identified,

an engineering solution could be applied to allow construction over the void or the siting of the structure could be adjusted to keep away from the void altogether.

If any segment of a lava tube should be encountered during construction, construction activity would be stopped and the proper authorities, including the Department of Land and Natural Resources would be contacted, so that an assessment can be made.

Implementation of protective measures during construction would minimize any impacts on topography, geology and soils. Typical measures include erosion control devices such as cut-off ditches, temporary ground cover vegetation, and various soil stabilization and protection materials.

3.2 Kaūmana Cave

Kaūmana Cave is a lava tube cave that formed during the 1880-1881 eruption of Mauna Loa (USGS, 1997 and 1995). There is some discrepancy in the literature regarding the length of Kaūmana Cave. The author of *The World's Longest Lava Tube Caves* provides a total length of 2,544 meters (1.58 miles), though admits that this length is underestimated (Crawford,. n.d). Despite these discrepancies in the estimated length, only a small segment of Kaūmana Cave underlies the proposed project site, and is directly relevant to this project. Refer to Figures 2-3 through 2-5 to see the alignment of Kaūmana Cave, as it relates to the project site and the proposed campus plan.

The depth of Kaūmana Cave, as a whole, averages 12 feet below ground surface. This estimate was provided in a technical report conducted in 1967 by von Seggern and Adams, in which the accuracy of electromagnetic mapping of Hawaiian lava tubes was tested using Kaūmana Cave as a case study. von Seggern and Adams used data provided by H.T. Stearns and G.A. Macdonald from a 1946 study involving Kaūmana Cave, in which they state that Kaūmana Cave has an "areal extent as 24 square miles and its estimated volume as 3×10^8 cubic yards, implying an average thickness of 12 feet" (von Seggern & Adams, 1967, p. 18). Through their study, von Seggern and Adams (1967) estimated the thickness of the ground between Kaūmana Cave and the surface in three widely-separated locations and found the thickness to be 24 feet, 24 feet, and 27 feet respectively. von Seggern and Adams (1967) concluded that the average depth of 12 feet for Kaūmana Cave, as provided by Stearns and Macdonald, may still be correct if the flanks of the flow are closer to the ground surface than the lava tube itself. However, the average depth of Kaūmana Cave, according to their observations was between 24 and 27 feet. Based on more recent surveys, some researchers believe the roof thickness of the cave could be as little as 5 to 10 feet in some places (P. Kambesis and Dr. F. Stone, letters dated September 3, 2009 and September 4, 2009, respectively).

The only legal access to Kaūmana Cave is through a collapsed skylight in a county park that is located west of the project site, across Kaūmana Drive. A stairway was built to provide public access into the cave. From the entrance in the county park, Kaūmana Cave extends both upslope and downslope. The downslope portion crosses beneath Kaūmana Drive, runs below a handful of residences along Kaūmana Drive, and continues downslope under the upper parcel of the project site. This segment of Kaūmana Cave ends at Edita Street, which separates the upper and

lower parcels of the project site. At Edita Street, there is another opening to the cave. This opening is artificial, having been created during the construction of Edita Street. Metal bars were placed across the opening to prevent entry or exit at Edita Street; however, the bars have been vandalized and bent to allow a person to squeeze into the cave (Stone, 1992). Unauthorized access to the cave at this location is in violation of the Hawai‘i Cave Protection Law, which requires written consent from the property owner prior to entry into a cave (the Hawai‘i Cave Protection Law is discussed further below). The length and alignment of this cave segment has been documented. The most recent known surveys were conducted in 1992 by Island Survey, Inc. for the Puainako Street Extension and Widening project (Okahara and Associates, 2000) and the Hawaii Speleological Survey in 1993 (Halliday, 1997).

Kaūmana Cave does extend downslope of Edita Street; however, this portion of the cave is believed to be inaccessible. When Edita Street was built in the 1950s, the cave was truncated and portions of the roof deliberately collapsed, thus preventing access to the portion of the cave downslope of Edita Street. The majority of this cave segment underlies the properties located directly northwest of the project site’s lower parcel. A small segment of the cave likely crosses the northernmost corner of the lower parcel.

This lower segment of the cave was mapped during a 1953 cave expedition conducted by members of the Hilo Lions Club. They explored 4,700 feet of the lava tube, from the main entrance at the county park until passage through the cave was no longer possible, including the approximately 1,200 feet of the cave below Edita Street, which is no longer accessible. The Lions Club members produced a map of this expedition, which provides the location and dimensions of Kaūmana Cave, as well as descriptions of the cave’s characteristics (Halliday, 1997). This map served as the basis for the cave alignment across the lower parcel shown in Figures 2-3 and 2-5. As stated previously, there are no known entrances into the lower segment of cave, and it appears that members of the Hilo Lions Club were the last persons known to document this segment of the cave.

Kaūmana Cave provides many resources to those interested in the unique attributes and ecological characteristics of lava tubes. It provides educational and recreational opportunities; and research opportunities for biologists, speleologists, volcanologists, hydrologists, and geologists. Kaūmana Cave is visited by members of the local population; scholars and speleologists in the global community; as well as tourists visiting the Hilo area. Kaūmana Cave can provide an important contribution to the understanding of adaptation and survival of cave invertebrates. Some educators recommend taking students on field trips to the cave for educational fieldwork, and using the cave’s resources for long-term scientific studies.

The biological characteristics of Kaūmana Cave were examined by Dr. Fred Stone in 1992 for an environmental impact statement conducted for the Puainako Street Extension and Widening project EIS (Okahara and Associates, 1993). During this biological survey, Dr. Stone addressed the close relationship that cave organisms have with the roots of the ‘ōhia trees that grow into the lava tube. In Hawaii’s lava tubes, tree roots are often the primary source of water and nutrients for cave flora and fauna (Howarth, 1972). In Kaūmana Cave, the roots of ‘ōhi‘a trees play an important role in the cave ecosystem. Sections of the cave with a low level of biodiversity coincide with areas devoid of ‘ōhi‘a tree roots—areas where the trees have been cleared at the

surface (Stone, 1992). Dr. Stone's 1992 study identified more that 15 species of endemic cave invertebrates that have colonized Kaūmana Cave. More recently, Dr. Francis Howarth in a letter dated September 4, 2009 has indicated that there are several noteworthy species within Kaūmana Cave, including crickets, moths, and planthoppers, among others. Two of these species—the Hawai'i cave water treader (*Cavaticovelia aaa*) and the Hawai'i cave rock cricket (*Caconemobius varius*)—are listed by the USFWS as species of concern. In addition, there are microorganisms that grow on the cave's walls. Otherwise known as "cave slime," these microorganisms are of scientific interest to microbiologists and other researchers (Dr. F. Stone and Dr. P. Boston, letters dated September 4, 2009 and September 6, 2009, respectively).

Currently, portions of Kaūmana Cave are used, or have been used, as illegal dump sites. Common household garbage, automobile waste, agricultural waste, pesticides, raw sewage, and other varieties of waste have been observed in the lava tube (Halliday, 1999 and 2003). The best-known garbage dump is located just downslope from Kilua Street. In spite of the fact that there are no documented dump sites directly beneath the upper parcel, flood can water push debris from the upslope areas of the cave toward the segment that underlies the upper parcel of the project site. Halliday (2003) suggested that as flood waters move through the cave, it is possible that residual products from illegal dump sites may be present in flood waters that exit Kaūmana Cave on Edita Street.

Cave Protection Law - In 2002, the State of Hawai'i passed the Hawai'i Cave Protection Law. Amended in 2008 and included in the HRS as Chapter 6D, the Hawai'i Cave Protection Law defines how caves are to be protected, what types of actions and resources warrant state intervention, and the responsibilities of landowners who have caves on their property. Among other pertinent inclusions in the Hawai'i Cave Protection Law, the following sections are relevant to Kaūmana Cave, as it relates to this project:

- §6D–2 prohibits any person from intentionally, knowingly, or recklessly breaking, harming, or damaging caves, their surfaces, or the resources within the cave.
- §6D–3 prohibits any person from dumping waste, garbage, litter, sewage, or toxic substances into a cave. However, new septic systems are permitted in proximity to caves, if they are installed with solid tanks and surface leach fields that prevent sewage from flowing into the cave.
- §6D–4 prohibits the disturbance of native organisms in a cave. This section also ensures that surface activities on the land above a cave shall not be prohibited or constrained in any way by inclusion of this section.
- §6D-7 prohibits entry into a cave, by any person, without prior written consent from the property owner. The segment of Kaūmana Cave that underlies the project site is owned by the State of Hawai'i, Department of Land and Natural Resources.

Development of surface lands situated above known caves and lava tubes are not necessarily prohibited under Hawaii's Cave Protection Law. Further, provisions of the cave protection law do not apply to caves inadvertently encountered during the normal course of construction activities, provided that any protection and mitigation measures identified during the HRS 343 environmental review and land use permitting conditions are followed.

3.2.1 Potential Impacts

PROPOSED ACTION

The Proposed Action is not expected to result in any short or long-term adverse impacts on Kaūmana Cave, including any biological or cultural resources contained within. A 100-foot protective buffer, as measured from the outer edges of the cave, would be observed. In Dr. Stone's 1992 Kaūmana Cave Report, a minimum 50-foot buffer was recommended for the road extension and widening project to maintain the cave's structural integrity. However, the County of Hawai'i Department of Public Works and the U.S. Fish and Wildlife Service determined that a buffer of 15 feet was sufficient to avoid impacting the cave. For its campus master plan, Connnections has chosen to maintain a larger 100-foot buffer to ensure the safety of construction workers and users of the school campus, and to minimize the potential for any adverse impacts to the cave.

With adherence to the 100-foot buffer, it is expected that the natural, educational, recreational, and historical resources of Kaūmana Cave would be preserved. On the upper parcel, the only structure proposed is an elevated walkway that would be located beyond the 100-foot buffer and would be a lightweight structure with shallow footings or pier foundations. While some selective felling of 'ōhi'a may be needed to construct the walkway, the number of trees cleared would be kept to a minimum. Further, the trees that may be cleared would be outside of the 100-foot buffer and would not effect the underlying ecosystem Kaūmana Cave, of which the 'ōhi'a roots are a significant component. The Proposed Action intends to preserve the native 'ōhi'a forest in situ, maintaining their habitat and the roots that grow into the lava tube. On the lower parcel, major school facilities nearest to the cave would be located over 200 feet away, well outside the 100-protective buffer.

Based on the master plan and vision for Connections, restoring and maintaining a pristine natural environment is very important to the school. The proposed project aims to maintain and improve the native tree population on the property, thereby minimizing disturbance to the native habitat for the ground-level ecosystem, or those dependent on the 'ōhi'a tree roots in Kaūmana Cave.

Under the Proposed Action, Connections would lease the property from the State of Hawai'i, Department of Land and Natural Resources. If Connections is successful in securing a long-term lease with DLNR, either DLNR or the Board of Land and Natural Resources would retain the right to grant entry to the portion of the cave that underlies state property. However, DLNR has indicated that if a request for entry were made, it would consult with Connections, as the property's lessee, to ensure that the activity(ies) for which entry is being requested, would not interfere with Connections' operations or educational programs. It should be noted that Connections has no intention of restricting the learning and research opportunities of others in relation to Kaūmana Cave.

ALTERNATIVES

Alternatives 1, 2 and 3 could potentially result in significant impacts to Kaūmana Cave. While the site layouts vary, all three alternatives proposed constructing buildings on the upper parcel, directly above Kaūmana Cave. Constructing over the known lava tube cave subjects the Proposed Action to safety hazards from potential collapse of the cave during construction and during operation of the school. To safely construct over the Kaūmana Cave, these alternatives

could require an engineering solution to design a structural foundation that spans the lava tube or concrete piers may be required to pierce the cave roof to reach stable bedrock on the cave floor. In additional, these alternatives would required clearing some of the ʻōhiʻa trees above the cave, which could have significant indirect effects to the cave ecosystem.

The No Action alternative would result in no impact on Kaūmana Cave.

3.2.2 Mitigation Measures

Although the Proposed Action limits all construction to beyond the 100-foot buffer zone, the following additional protective measures should be undertaken. The cave alignment should be verified prior to initiating construction and delineating boundaries of the 100-foot buffer. During construction, the boundaries of the buffer zone should be clearly marked with brightly colored surveyors tape or similar. Construction personnel should be fully informed of Kaūmana Cave, adherence to the buffer zone, and the potential risk of working within vicinity of the cave.

If, during construction on the lower parcel, an entrance to the inaccessible portion of Kaūmana Cave is found or inadvertently created, or if previously unknown segments of the Kaūmana Cave system are encountered, all construction activity in the vicinity of the find would cease immediately and the proper authorities, including the Department of Land and Natural Resources, contacted to assess the lava tube and its contents.

3.3 Hydrology, Surface Water, and Groundwater

Rainfall is abundant in the Hilo area, with the project area receiving between 160 and 200 inches of rain annually (Juvik and Juvik, 1998). Much of the rainfall percolates into the ground, recharging the underground aquifers. During periods of heavy precipitation, runoff can be problematic if the amount and rate of runoff exceeds the percolation rate of the underlying ground surface.

Surface Water

There are no perennial streams, lakes or ponds within the project site or in the immediate vicinity. The nearest perennial stream is Waipahoehoe Stream, which flows north of the project site and feeds into the Wailoa River. There is topographical evidence that indicates the presence of an intermittent stream south of the lower parcel that drains towards Alenaio Stream. Runoff that flows through Kaūmana Cave to the concrete channel along Edita Street feeds into this intermittent stream. Inland waters in the vicinity of the project site are designated as class 2 waters and the nearest marine water to the project site is Hilo Bay, which is designated as class A waters.

Groundwater

The project site is located within the Northeast Mauna Loa Aquifer Recharge Zone (Juvik and Juvik, 1998). With the highly permeable pāhoehoe flows, which are characteristic of the project site, precipitation quickly percolates into the ground where it recharges this aquifer resource. The Mauna Loa Aquifer Recharge Zone provides a sustainable yield of approximately 740 million gallons per day (gpd) of fresh water for the residents, forests, and ecosystems within the zone, including the town of Hilo and surrounding area.

Kaūmana Cave

Given the high level of annual rainfall in the Hilo area, there does exist the potential for the presence of stream water in the Kaūmana cave system throughout the year, although water is not present in the cave at all times. Halliday notes that, "the lower 2.2 km of this cave (from Kilua Road to Edita Street) lacks stream flow unless rainfall exceeds ~20 cm within a period of 2-3 days: a common occurrence in all seasons" (2003, p. 72) and that, "in periods of normal rainfall, running water sometimes is audible beneath the floor of this section of the cave" (2003, p. 72).

Contrary to some of the literature, lava tubes do not generally function as groundwater conduits. Halliday notes that "groundwater conduit flow is almost exclusively a floodwater phenomenon" (2003, p. 72). In this same article, Halliday notes that Kaūmana Cave is a known conduit for floodwaters, and debris transported by floodwaters has been observed several meters above the floor of the cave, indicating that water levels in the cave have the potential to rise several meters above the cave floor (2003 and 1999). Flooding is caused both by natural seepage through the cave walls and surface runoff that is diverted from the upper parts of Kaūmana Drive into the cave. Floodwaters in Kaūmana Cave emerge at the Edita Street opening, where it flows into a concrete channel that runs parallel and adjacent to Edita Street. From this channel, water passes under Edita Street through a culvert and discharges into the intermittent stream discussed above. During severe storm events, the concrete channel has been known to overtop and flood Edita Street. Risk and impacts from flooding is addressed in Section 3.4. Intensive flooding from a record-breaking rainfall in 2000 caused the cave to overflow through a ceiling vent upslope from the project site (Halliday, 2003), which also indicates that, on occasion floodwater can reach extremely high levels in the cave.

3.3.1 Potential Impacts

PROPOSED ACTION

There are no anticipated long-term impacts to hydrology, surface water or groundwater resulting from the Proposed Action. As a result of the Proposed Action, there would be an increase in impermeable surfaces, thereby increasing the amount of surface runoff. However, final engineering plans for the site would include site drainage plans that provide swales or drain inlets that direct runoff from newly paved areas into detention basins or drywells, where it would be retained until it percolates into the ground. The Proposed Action would be implemented in compliance with applicable the regulations contained in HAR 11-54 and meet the criteria set forth in the antidegradation policy (HAR 11-54-1.1), designated uses (HAR 11-54-3), and water quality criteria (HAR 11-54-4 through 11-54-8). Any discharges of wastewater or stormwater into State surface waters would obtain the necessary National Pollution Discharge Elimination System (NPDES) permit in accordance with HAR 11-55. A rain catchment system for roof runoff would be implemented, which would help reduce the amount of surface runoff. If warranted, site engineering plans may also need to accommodate potential flood water exiting Kaūmana Cave at Edita Street. Potential storm drainage impacts are addressed in Section 3.4.

The construction contractor would develop and implement a site-specific BMP plan to minimize potential impacts to ground and surface water sources during construction. Required permits such as a County of Hawai'i grading permit and a NPDES permit for construction-related storm water discharge would also impose permit conditions, which must be adhered to by the

construction contractor.

ALTERNATIVES
Similar to the Proposed Action, Alternatives 1, 2 and 3 would not adversely affect surface or groundwater resources. The No Action alternative would have no affect on the existing ground or surface waters in the area.

3.3.2 Mitigation Measures

No mitigation is warranted or proposed. Adherence to applicable regulations, construction site BMPs and conditions of the grading permit and NPDES permit should prevent any potential effects to hydrology, surface water and ground water.

3.4 Natural Hazards

Flood Hazards

Flood events on the Island of Hawai‘i are generally associated with severe rainstorms, storm surge, or tsunami inundation. The island is geologically young, and in many areas enough time has not passed for the formation of defined watercourses. Poorly defined watercourses often flow and overflow during storm events. The South Hilo district is particularly impacted by this problem due to high amounts of rainfall. The Federal Emergency Management Agency (FEMA) has classified the area in which the project site is located, as Zone X. Zone X are lands with no recognized flood potential and are located outside both the 100-year and 500-year floodplain. This classification means that the project site is located outside of the 0.2 percent annual chance floodplain, and that no base flood elevations or depths are shown for this zone (NFIP, 2009). The risk of flooding from large surface water flood events is low.

Although the risk is low, there is hazard from large, infrequently occurring flood events from water discharged from Kaūmana Cave. Water that naturally seeps into Kaūmana Cave during periods of high rainfall along with surface runoff from the upper regions of Kaūmana Drive that are diverted into Kaūmana Cave can create flood conditions. As flood waters are channeled through Kaūmana Cave, as has been noted by Halliday (2003 and 1999), there is potential that the water volume could be high enough to exit the cave system through the opening on Edita Street, as noted by Stone (1992) and Halliday (2003 and 1999). From the Edita Street exit, storm water then flows through a concrete channel running parallel to, and alongside Edita Street, where it is directed into a culvert underneath the road and into an intermittent stream that borders the lower parcel’s southern boundary. During severe storms, water has been known to overtop the concrete channel and flow across Edita Street, thus creating a flood risk for the project site, as well as for the surrounding neighborhood.

Volcanic Hazards

The Island of Hawai‘i was developed from the eruptions of five volcanoes: Kohala, Hualalai, Mauna Kea, Mauna Loa, and Kilauea. Of these, Mauna Loa and Kilauea are active today. Hilo is located just 30 miles north of Kilauea, and is situated in the saddle zone between Mauna Kea and Mauna Loa. The saddle zone on the eastern flanks of these two volcanoes is a natural dip in the topography of the island created from overlapping lava flows from their historic eruptions. This topographic dip increases the probability that lava flows originating from the northeastern rift

zone of Mauna Loa would flow toward the South Hilo area, because lava, like other liquids, flows downhill and towards the path of least resistance.

The project site is located on lava fields from the 1880-1881 eruption of Mauna Loa. This 128-year-old flow is the nearest to Hilo that lava from Mauna Loa has come for over 1,000 years (USGS, 1995). Lava flowing toward Hilo during the 1880-1881 eruption was not a unique occurrence. In recent history, lava originating on the northeastern flanks of Mauna Loa has followed this course several times. The 1855, 1880, 1935, 1942, and 1984 eruptions from Mauna Loa have all sent lava flowing toward Hilo (Wolfe & Morris, 2005; Stearns, 1966). Figure 3-3 shows the historic lava flow paths from eruptions occurring between 1843 and 1984.

Nine lava-flow hazard zones have been delineated on the island of Hawai‘i to provide a quick assessment of a parcel’s risk to exposure and damage from lava. These zones are based on historical eruption patterns and geologic mapping of older flows on the volcanoes’ flanks. According to the United States Geological Survey (USGS), much of South Hilo is contained in Lava Flow Hazard Zone 3, which consists of areas that have had 15 to 75 percent of their surface covered by lava in the last 750 years, and 1to 5 percent of their surface covered by lava since 1800. On a scale of ascending risk, Zone 3 lands are less hazardous than Zone 2 lands, which designate areas directly adjacent to and downslope of active rift zones (USGS, 1991; Heliker 1990). The project site, as well as all the surrounding development and most of Hilo, is located in Lava Flow Hazard Zone 3. Refer to Figure 3-4 for the Lava Flow Hazard Zones for the Island of Hawa‘i.

Lava Tube Hazards

Lava tubes are common in areas that are covered by flood basalts typical of the Hawaiian volcanoes. The magma has a very low amount of silica that causes it to be highly viscous and very hot. As magma emerges and begins to flow, the surface of the flow cools rapidly and only the interior parts of the flow remain liquid. This creates voids within the cooled portion of the flow as the hot interior material continues to flow downslope. If the lava flow is particularly thick, larger voids are formed. Lava tube hazards are directly related to the diameter of the tube. The larger the interior space, the probability increases that the roof will collapse either on its own accord or when additional weight is placed on it.

Seismic Hazards

The Island of Hawai‘i experiences thousands of earthquakes a year, most are undetectable; however, some are strong enough to be felt or to cause damage. Most of the earthquakes in Hawai‘i are harmonic tremors associated with volcanic activity and magma moving beneath the surface. These tremors tend to be concentrated beneath the island’s two active volcanoes, Kilauea and Mauna Loa. Seismic tremors on the Big Island have caused ground cracks, landslides, ground settlement, tsunami and mudflows. Seismic activity can damage or destroy buildings and other structures, as well as utility and infrastructure lines, which often result in disruption of service.

Earthquakes over 6.0 on the Richter scale can result in significant damage to man-made structures. Since 1868 there have been 15 earthquakes greater than magnitude 6.0 with most of

them occurring on the south flank of Kilauea or Mauna Loa. The dates, locations, and magnitudes of these earthquakes are summarized in Table 3-1.

Table 3-1. Earthquakes Magnitude 6.0 or Greater since 1868 on the Island of Hawaii

Year	Date	Location	Magnitude
1868	March 28	Mauna Loa South Flank	7.0
1868	April 2	Mauna Loa South Flank	7.9
1929	October 5	Haualalai	6.5
1941	September 29	Kaoiki between Kilauea and Moana Loa	6.0
1950	May 29	Mauna Loa SW rift Zone	6.2
1951	April 22	Kilauea	6.9
1951	August 21	Kona	6.3
1952	May 23	Kona	6.9
1954	March 30	Kilauea south flank	6.0
1962	June 27	Kaoiki	6.5
1973	April 26	Honomu	6.1
1975	November 29	Kilauea south flank	7.2
1983	November 16	Kaoiki	6.5
1989	June 25	Kilauea south Flank	6.1
2006	October 15	Kiholo Bay	6.7

Source: USGS, 2006

3.4.1 Potential Impacts

PROPOSED ACTION

Flood Hazards

Under the Proposed Action, major school facilities would be developed on the project site's lower parcel. The architectural concept of the campus envisions most of the buildings and structures to be elevated above ground level, thus reducing the risk to damage from flooding if the concrete channel along Edita Street should overtop. In conformance with applicable regulations, any additional storm water runoff generated by the Proposed Action would be contained within the property's boundary and site improvements would not alter the existing drainage patterns of surrounding properties. Thus, the Proposed Action would not increase the risk of flooding to neighboring or downslope parcels. Site-specific measures would be developed to control drainage and runoff resulting from impermeable surfaces and placement of new structures at the project site. During design development, detailed engineering studies would be conducted in order to develop appropriate drainage plans, which would take into account any measures that might be needed to address the potential flood hazard posed by the conditions along Edita Street.

Volcanic Hazards

Any development within this area of South Hilo is subject to the hazard of damage from lava flows and other volcanic hazards. There are no practical measures to avoid this impact.

Identification of areas that will be inundated by molten lava cannot be determined until the next eruptive phase begins.

Lava Tube Hazards

While there are no known lava tubes beneath the area to be developed, the Proposed Action does have the potential to contribute to the collapse of lava tubes if unknown tubes or voids are encountered during construction. Earth movement from construction activities, as well as general human occupation of the site could contribute to this occurrence. The most obvious hazard is when the roof of a previously unknown lava tube collapses. There have been known instances of construction equipment inadvertently collapsing previously unknown lava tubes. One such example is cited by Mcdonald, Abbott & Peterson (1983, p. 27) when "a bulldozer clearing land on the slope of Kilauea volcano broke through the roof of a lava tube and dropped about 10 meters [32.8 feet]."

Seismic Hazards

The threat from seismic hazards will always exist as humans have little control over the frequency and intensity of these unpredictable events. Any development on the Island of Hawai'i is at risk of experiencing seismic activity based on the island's geologic characteristics. However, since there would be minimal onsite grading, and buildings would not require permanent foundations, the risk of seismic-related subsidence or erosion is significantly reduced.

ALTERNATIVES

Flood Hazards

For Alternatives 1 and 3, the potential impacts related to flood hazards would be the same as the Proposed Action. These alternatives also proposed development of major facilities within the project site's lower parcel, which may be subject to periodic flood events during severe storms. Alternative 2 would not be exposed to flood hazards as this alternative proposes to develop major school facilities within the upper parcel. Under this alternative, the only facility located on the lower parcel would the agricultural facilities (i.e., barn and greenhouses).

Volcanic Hazards

For all three alternatives, the risk related to volcanic hazards would be identical to the Proposed Action.

Lava Tube Hazards

For all three alternatives, the risks related to lava tube hazards are greater as compared to the Proposed Action. All alternatives propose constructing major school facilities directly above Kaūmana Cave, which could increase the probability of collapsing the cave roof.

Seismic Hazards

For all three alternatives, the risk related to volcanic hazards would be identical to the Proposed Action. There would be no risk related to natural hazards under the No Action alternative.

3.4.2 Mitigation Measures

Flood Hazards

Onsite flood control would be accomplished by designing drainage systems to contain runoff within natural or man-made watercourses and detention basins or drywells. Prior to initiation of construction, the county would review proposed grading and construction (including drainage) plans for consistency with county requirements and good engineering practices. After approval, all plans would be monitored during periodic building inspections.

Volcanic Hazards

To date there are no adequate mitigation measures for lava flows. Numerous attempts have been made to control volcanic flows, including bombing, hydraulic chilling, and constructing walls to deflect flows. These methods have had mixed success. These methods cannot be expected to modify large or fast moving flows, and their effectiveness with smaller flows requires further evaluation (Keller, 1999).

Monitoring efforts to identify areas that may be threatened by lava in the first few hours of the next eruption phase are critical. Actual areas that would be covered by lava flows, and the warning time that can be given before lava reaches any given area are dependent upon key factors, such as the location of active vents, rate of lava production, duration of the eruption, and local topography. As a precautionary measure, the school should devise and maintain an evacuation plan for the campus.

Lava Tube Hazards

To minimize the potential hazard due to the collapse of an unknown lava tube that may be located within the project site, a geotechnical investigation should be performed for construction areas and appropriate measures employed to address site specific conditions. Such measures could include backfilling the lava tube; spanning the tube with girders or other means of support to minimize stress on the cave roof; or modifying the facility layout to avoid the lava tube altogether.

Seismic Hazards

Engineers, seismologists, architects and planners have carefully evaluated seismic hazards related to building construction. They have devised a system of classifying seismic hazards based on the expected strength of ground shaking and the probability of shaking actually occurring with in a specified time. The results are incorporated into the seismic provisions of the Uniform Building Code (UBC). The Island of Hawai‘i is located in seismic zone 4. All facilities would be designed and constructed in conformance with all required UBC specifications applicable to structures being constructed within seismic zone 4.

3.5 Biological Resources

A biological survey of the project site’s surface area was conducted in support of this EA. The survey consisted of four components, a botanical survey, an invertebrate survey, an avian survey, and a mammalian survey. The results of these surveys are discussed below. Additional detailed information can be found in the biological survey, which is attached as Appendix D. In

summary, the biological survey concluded that there is nothing unique about the project site. There is an abundance of similar habitats in, and around Hilo. Further there is no federally delineated Critical Habitat within or near the project site.

Flora

The botanical survey of the project site was undertaken on December 10 and 11, 2008. During the survey a total of 65 plant species were identified, 11 of which are classified as native, or occurring naturally, to the Hawaiian Islands. No protected plant species were recorded during the survey. A complete listing of plant species found within project site can be found in the biological survey report attached as Appendix D.

As previously noted, the project site is located on the Mauna Loa lava flow of 1880-1881. Thus, vegetation within the project site reflects the largely native plant community that developed after 1881 lava flow. As the surrounding properties came to be developed and Saddle Road was constructed, opportunities opened for non-native species to invade the native plant community. This process has been slow, but has accelerated where the native plant community has been disturbed, either by clearing, grubbing, or, in the case of Edita Street, cutting the property into two parcels with complete removal of a swath of native plants.

Despite the lack of soil, the relatively high rainfall in the project area has resulted in dense vegetation blanketing the project site. The upper parcel (west of Edita Street) is characterized as a native Lowland Wet Forest consisting primarily of ʻōhiʻa trees (*Metrosideros polymorpha*) with a dense understory of Pacific false staghorn fern or ʻuluhe (*Dicranopteris linearis*) (AECOS, 2009). The dense ʻuluhe fern effectively keeps most other species from colonizing this parcel. There is considerable variation in the density of the ʻōhiʻa trees from place to place, but can approach a closed canopy where undisturbed. In contrast, vegetation in the lower parcel (east of Edita Street) consists of a mix of native and non-native plant species, including albizia (Falcateria *moluccana*) trees and forests of strawberry quava (*Psidium cattleeianum*).

Fauna

Invertebrate, mammalian, and avian field surveys of the project site were conducted between November 2008 and January 2009. During the surveys, a total of 20 invertebrate, 15 avian, and 1 mammalian species were documented to be present within the project site. A complete listing of faunal species encountered can be found in the biological survey report attached as Appendix D.

Invertebrate faunal and plant populations are interdependent and the presence of host plants is an indicator of the health of invertebrate populations. The 1880-1881 lava flow and the relatively young native forest it supports, has resulted in a limited diversity of Hawaiian host plants. Consequently, there is a limited number and diversity of native invertebrates at the project site. Additionally, the low elevation of the project site provides easier access to and has resulted in higher numbers of introduced predators, such as ants, which contribute to the low number of native invertebrate populations on site (AECOS, 2009). Several native species of arthropods were observed during the survey; however, no federally-listed species were noted. Further, there is no federally-designated Critical Habitat for any invertebrate species within or adjacent to the project site.

Avian diversity and densities were consistent with the habitat present within the project area. Of the 15 different avian species recorded during this survey, all but two are alien to the Hawaiian Islands. One indigenous migratory species, the Pacific Golden-Plover (*Pluvialis fulva*) was encountered during the survey. Additionally, a single Hawaiian Hawk (*Buteo solitarius*) or io was detected as an incidental observation while transiting between two count stations. The Hawaiian Hawk is an endemic endangered species currently protected under both federal and state of Hawai‘i endangered species statutes. The Hawaiian Hawk was first listed as endangered in 1967, proposed for down listing from endangered to threatened in 1993, and has recently been proposed for delisting altogether (AECOS, 2009).

Although none were observed during the survey, it is possible that the project site is over flown between May and December by the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*) or ua‘u and the threatened Newell’s Shearwater (*Puffinus auricularis newelli*) or ‘a‘o. However, there is no suitable nesting habitat within or close to the project site for either of these two seabird species.

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or ope‘ape‘a, all terrestrial mammals currently found on the Island of Hawai‘i are alien species. Only one mammalian species was detected during the course of this survey, the domestic dog (*Canis f. familiaris*). During the survey tracks, scat and sign of dog were encountered and several dogs were heard barking from the adjacent residential lots.

Although, Hawaiian hoary bats were not recorded during this biological survey, bats have been recorded on numerous recent surveys conducted within the general Hilo area. Key findings include the opinion that, at least on the Island of Hawai‘i, the bat is ubiquitous in areas that still have forest or dense cover, and it can be expected that Hawaiian hoary bats use resources within the general project vicinity on a seasonal basis.

3.5.1 Potential Impacts

PROPOSED ACTION

Flora

The lower parcel of the project site, on which the major campus facilities are planned for development, consists largely of non-native trees and weed species. The native Lowland Wet Forest comprising the upper parcel is not unique and is abundant in and around the Hilo area. Impacts to the upper parcels native ‘ōhi‘a forest would be minimal, as the Proposed Action would only construct an elevated walkway and would leave much of the existing native forest untouched. Connections proposes to implement native reforestation projects throughout the entire campus, particularly within portions of the upper parcel. Finally, there are no protected, rare, or endangered plant species present on the project site and no significant adverse impacts to plant resources are anticipated.

Fauna

There is a small potential that construction-related activities, or habitat modification associated with the Proposed Action, may result in impacts to the following four species, all of which are protected under both federal and State of Hawai‘i endangered species statutes: Hawaiian Hoary Bat, Hawaiian Hawk, Hawaiian Petrel, and Newell’s Shearwater.

No Hawaiian Hoary Bats were detected during this survey, but they have been recorded within the general project area on numerous occasions. The principal impacts to the Hoary Bat posed from clearing and grubbing the vegetated portions of the project site is disturbance to roosting females during the pupping season. Females tending their young are less able to rapidly vacate a roost tree or bush as it is being felled, or cleared.

Construction noise is the principal potential impact the Proposed Action poses to Hawaiian Hawks. During clearing and grubbing operations, there is a small chance that construction noise could disturb birds nesting in the general project area. If disturbed while sitting on eggs or caring for young, adult birds may abandon the nest putting their eggs, and young, at risk of harm or mortality.

The principal potential impact that that the Proposed Action poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds would be downed after becoming disoriented by exterior lighting. Exterior lighting may be necessary during construction activities, or while servicing construction equipment at night. Exterior lighting may also be problematic following build-out, with potential impacts posed by street lights and building lights.

In summary, Proposed Action would not result in any impacts to federally-designated critical habitat. Additionally, it is expected that construction activities and operation of the campus would not result in long-term significant adverse impacts to faunal resources present within the general project area.

ALTERNATIVES

Alternatives 1, 2 and 3 would result in more impacts to flora resources as compared to the Proposed Action, because all these alternatives require more clearing of the upper parcel's native ʻōhiʻa forest. Alternatives 2 and 3 in particular, would require the clearing larger areas of the ʻōhiʻa forest. Potential impacts to faunal resources would be similar to those of the Proposed Action. The No Action alternative would have no effect on biological resources. All three alternatives could result in adverse impacts to the flora and faunal resources to the segment of Kaūmana Cave that underlies the upper parcel of the project site. Refer to Section 3.2 above for a discussion the Kaūmana Cave and its resources.

3.5.2 Mitigation Measures

Early consultation with the U.S. Department of Fish and Wildlife Service (USFWS) resulted in their conclusion that there is no federally-designated critical habitat on or near the proposed project site. However, the USFWS, and the findings of the biological survey, recommend the following measures to minimize any potential impacts to the Hawaiian Hoary Bat, the Hawaiian Hawk, the Hawaiian Petrel, and Newell's Shearwater.

- To reduce the potential for interactions between clearing, grubbing and construction activity and Hawaiian hoary bats, it is recommended that clearing and grubbing not be undertaken during the birthing and pup rearing season. If clearing cannot be avoided during this period, it is recommended that a survey be conducted to verity if bats are present.

- To avoid disturbance to nesting Hawaiian Hawks, tree clearing should be avoided during the breeding season from March to September. If tree clearing must be conducted during this period, it is recommended that a survey be conducted to verify if any Hawaiian Hawks are present. One such survey could be an audio playback nesting activity survey, which should be conducted by a qualified ornithologist on the site where large trees will be removed prior to the onset of clearing and grubbing activities. This is to ensure that the construction activities will not disturb nesting Hawaiian Hawks. If nesting activity is detected, consultation with the USFWS would be required prior to conducting further clearing activity within 500 meters of the nest tree. This recommendation may be irrelevant if the current petition to delist the Hawaiian Hawk is enacted.

- To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting be shielded. This mitigation would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Hawai'i County Code §14 – 50 et seq. This section of the county code requires the shielding of exterior lights to lower the ambient glare caused by unshielded lights, which negatively impacts the astronomical observatories located on Mauna Kea.

3.6 Air Quality

Generally the air quality in Hilo is very good due to the prevailing trade winds, which provide for good air circulation and clean fresh air. During times when there are southerly or "kona" winds or stagnant atmospheric conditions, the air quality can change. These conditions can result in the build up of both manmade and volcanic emissions. When the volcanoes are active, these conditions produce a volcanic haze called vog. Sunlight triggers a reaction in the gases and transforms the sulfur gases and water molecules to sulfuric acid, which makes up the volcanic haze. Manmade emissions that consist of carbon-based gases are also converted by sunlight to toxic carbon monoxide.

3.6.1 Potential Impacts

PROPOSED ACTION

The Proposed Action would not result in significant direct or indirect, long-term impacts to air quality. The school would not be a major stationary source of air pollutant emissions. The campus is being designed to have a small carbon footprint and make use of alternative energy sources and structural techniques that will keep cooling and lighting to a minimum. The project would not increase the discharge of carbon-based gases or change the amounts of volcanic gases released into the atmosphere.

Short-term impacts to localized air quality would likely be generated by construction activities at the project site. Construction-related vehicular activity would temporarily increase automotive pollutant concentrations at the project site and adjacent streets. Construction activities would also generate dust emissions resulting in an increase of particulate matter levels in the project area; however, adherence to construction site BMPs would significantly reduce these emissions. These

sources of pollutants are temporary in nature and would not result in long term adverse impacts on ambient air quality.

ALTERNATIVES
Similar to the Proposed Action, Alternatives 1, 2 and 3 would not adversely affect air quality. The No Action alternative would have no affect on ambient air quality.

3.6.2 Mitigation Measures

During the construction period, dust control measures would be implemented to reduce the amount of particulate matter emissions at the site. The erection of dust screens around the construction site and the frequent watering of unpaved roadways and exposed soil areas can help with on-site dust control. Dust can be further minimized by paving and/or landscaping bare earth areas as soon as practicable. Construction activities would be conducted in accordance with BMPs for construction sites and in compliance with all applicable air quality regulations, including provisions contained in HAR 11-60.1 – 33 *Fugitive Dust.*

3.7 Acoustical Environment

Noise in the area is low and derived mainly from motor vehicles, with occasional noise from road use and residential maintenance activities. Other noises are from the wind, birds, coqui frogs, domesticated animals and other sounds typical of a semi-rural neighborhood.

3.7.1 Potential Impacts

PROPOSED ACTION
Short-term noise impacts generated from construction-related activities at the project site would result from the Proposed Action. Noise generated by such activities (e.g. earth moving equipment, construction vehicles, etc.) can generate intermittently high noise levels, particularly during close-in construction work. However, these impacts would be short-term and temporary in nature and would not result in long-term adverse impacts to the existing acoustical environment. Further, adhering to construction site BMPs and compliance with applicable noise regulations would minimize any construction-related noise impacts.

The Proposed Action would surround the campus with vegetation, such as trees, to create a barrier between the school and nearby residential areas. This vegetative barrier would provide a buffer for operational noise generated by school activities. In addition, many of the nearby residences are located closer to Edita Street and Kaūmana Drive and are situated away from the campus proper, which is toward the middle of the lower parcel. Daytime school activities, as well as intermittent after school and evening events, would be monitored to ensure that activities do not significantly impact ambient noise levels. As such, school operations are not expected to adversely impact ambient noise levels.

ALTERNATIVES
Similar to the Proposed Action, alternatives 1, 2 and 3 would result in short-term construction-related impacts on the existing acoustical environment. However, unlike the Proposed Action, the other alternatives considered could result in somewhat increased noise effects on the adjacent residences. Alternatives 1, 2, and 3 all propose constructing major school facilities on the upper

parcel, where the majority of nearby residences are located. Residences abut both the northern and southern boundaries of the upper parcel. The No Action alternative would have no effect on the surrounding noise environment.

3.7.2 Mitigation Measures

Construction activities that generate noise would be conducted during reasonable hours. In cases where construction noise is expected to exceed the DOH's maximum permissible property line noise levels, contractors would obtain a permit per HAR Title 11, Chapter 46 (Community Noise Control) prior to construction. DOH would then review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restrictions of equipment type, maintenance requirements, restricted hours, and portable noise barriers. As the site is partially isolated, it is likely that there would be no need for special mitigation measures.

3.8 Land Use

Much of the land surrounding the project site historically was used for intensive agricultural cultivation. Over time, some of these lands have been converted to residential use, although some agricultural uses remain. However, because of its location within the 1880-1881 lava flow, the soils within the project site generally have been too thin to support pasturing of animals or intensive agricultural cultivation. Presently, the project site is overgrown, vacant, and undeveloped.

Although, many of the parcels are still vacant, the project site is bounded along much of its perimeter by existing residences on Kaūmana Drive, Edita Street, and Melemanu Street. West of the property, on the far side of Kaūmana Drive, is the main entrance to the Kaūmana Cave, which has been designated as Kaūmana Caves County Park. Downtown Hilo is located approximately 2 miles northeast of the project site.

The project site is within the State Land Use Agriculture District. Land immediately to the north and south of the project site are designated as Urban and Agriculture, respectively. State land use designations of the project site and surrounding vicinity are shown in Figure 3-5.

The project site is zoned A-1a (Agricultural – minimum 1 acre lot size) by the County of Hawai'i. Lands immediately south of the project site are also zoned for General Agricultural use, and lands to the north are zoned predominantly for Single Family Residential use. County zoning designations of the project site and surrounding vicinity are shown in Figure 3-6.

The County of Hawai'i General Plan designation for the subject parcel is Low Density Urban, which permits residential, ancillary community and public uses, and neighborhood and convenience-type uses.

The Proposed Action is allowable within the definitions of the various land use designations discussed above; however, permits requiring approval by the County and the State Land Use Commission would have to be secured.

3.8.1 Potential Impacts

PROPOSED ACTION

From a regional planning perspective, the proposed construction and operation of the school would not result in adverse impacts as it would occur within an area with compatible land uses, as well as proximal to infrastructure and services capable of serving the development. Conversely, the Proposed Action would beneficially impact area land use by providing permanent public educational facilities to support the growing residential community of Kaūmana.

No significant adverse impacts are anticipated as a result of the proposed project. On-site construction-related impacts (e.g. excavation, hauling, drilling, heavy equipment usage, etc.), would be minor, and would only temporarily affect the integrity of surrounding land uses in the area.

ALTERNATIVES

Alternatives 1, 2 and 3 would result in similar land use impacts as the Proposed Action. The No Action alternative would have no effect on existing land use.

3.8.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.9 Utilities

Energy and Communications

Electrical services in the project vicinity are provided by the Hawaii Electric Light Company (HELCO) and communications by fiber optic backbone connections provided by Hawaiian Telcom.

Water Supply

The Hawai‘i County Department of Water Supply (DWS) provides water to the area via an existing 8-inch waterline along Kaūmana Drive and from an existing 8-inch waterline along Edita Street both fronting the project site. The current water availability, which is subject to change, is limited to a maximum of seven units of water per pre-existing lot of record. Each unit of water is equal to a maximum usage of 600 gpd; therefore, a maximum of 4,200 gpd is available for the proposed project.

Wastewater

Currently, there is no municipal wastewater system serving the project area, and the Proposed Action, like the surrounding area residences, would have to provide its own wastewater system.

Drainage

In the Kaūmana area, the storm drainage system consists of roadside ditches, culverts and narrow channels. Most of the area’s storm water runoff is discharged through Waipahoehoe or Alenaio Stream. The project site is underlain by porous pāhoehoe lava flow. This results in a terrain in which the majority of rainfall rapidly percolates into the substrate.

During storm events, runoff along the upper regions along Kaūmana Drive flow into and through Kaūmana Cave. Stormwater exits through an opening at Edita Street into a concrete channel that runs parallel and adjacent to the street. From the concrete channel, storm water flows under the roadway and discharges into an intermittent stream that borders the lower potion of the property. Under most circumstances the existing drainage system is adequate. While not common, stormwater has been known to overtop the concrete channel and flow across Edita Street.

Solid Waste

Solid waste management on the Island of Hawai‘i has undergone significant changes in the past few decades. Currently, residences take their solid waste to any one of 21 transfer stations around the island. The solid waste is then hauled to either the Hilo or Pu‘uanahulu landfills. In some areas, private haulers are paid to pick-up refuse from residences for disposal at a landfill.

3.9.1 Potential Impacts

PROPOSED ACTION

Energy and Communications

The Proposed Action would obtain energy and communication services from the utility providers discussed above. Appropriate coordination with both HELCO and Hawaiian Telcom would be conducted during the design and construction phase of the proposed improvements.

The Proposed Action is not anticipated to have any adverse impacts on either energy or communications utilities and is expected to have little to negligible impacts on the existing electrical distribution and communications networks of the area. There would be no disruption or significant increased demand for either utility. Existing systems are able to accommodate the demands of the proposed project. Additionally, energy demands from HELCO would be substantially reduced as a result of the Proposed Action’s energy saving features previously discussed in Section 2.1.2.

Water Supply

The Proposed Action would connect to the existing county water supply infrastructure for its potable water needs. However, as previously discussed, the Proposed Action would serve its non-potable water supply needs with an extensive rainwater collection system consisting of catchment tanks, storage reservoirs/tanks, and a network of water lines to distribute the collected rainwater throughout the campus. Rainwater would be collected from building roof tops and transmitted to a catchment tank(s) in the eastern portion of the campus. Rainwater would then pass through a catchment water treatment system and be pumped up to a reservoir tank(s) in the western portion of the campus. From these reservoir tanks, water would be pumped throughout the campus for non-potable water uses.

The county’s DWS has state that it has no objection to the use of a private catchment system. However, DWS’s Water System Standards do not cover catchment systems and their plan review would be limited to the service lateral, water meter, and backflow prevention assembly installation only. Further, DWS states that the potable water system and the catchment system cannot be interconnected.

Using a gross estimate of 60 gpd/student, the project could result in a potable water demand of roughly 26,100 gpd. This demand would be reduced by the use water efficient fixtures and by the use of rainwater and recycled water for non-potable uses such as toilet flushing, landscaping and agricultural uses. Based on the approximate square footage of building roof area and average rainfall in the project area, it is estimated that as much as 30,000 gpd could be collected by a catchment system. Potable water use would be limited primarily to faucets and kitchen use.

During the project's design phase, detailed analysis would be conducted to generate a more accurate estimate of potable water demand. Analysis would take into account, among other things, the number and type of fixtures to be used in the facility (e.g., waterless urinals, high efficiency toilets, dual-flush toilets, etc.), to what extent rainwater and recycled water can be utilized in place of potable water, and if needed, where development plans could be scaled back to contain potable water demands within the DWS allocation. For example, Connections could choose to retain the kitchen function at the Kress building in downtown Hilo, which would further reduce the potable water usage at the project site. During design development, DLNR's Engineering Division and the County of Hawai'i DWS would be provided with maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i. Calculations would quantify the estimated water demand for the proposed project, so that it can be included in the state's and county's respective water plans.

It is Connections intention to develop an environmentally sustainable campus, which includes minimizing its use of fresh potable water. Every effort would be made to meet the school's water needs with alternative water sources (i.e., rainwater and recycled water). Options that use alternative water sources would be given priority consideration above potable well development. Use of rainwater and recycled water would be utilized to the maximum extent possible, not only to reduce their demand on the municipal water supply, but to demonstrate their commitment to sustainability. However, if during design development, it becomes evident that developing a potable may be needed, additional detailed analyses would be conducted to determine any potential adverse effects associated with this alternative, including impacts on other wells and the underlying aquifer. If warranted, a Supplemental EA could be prepared specifically to address this issue if its implementation emerges as a viable option.

If a potable well is developed for this project, it would be considered a regulated public water system and would have to comply with HAR 11-20 "Rules Relating to Potable Water Systems." Among other things, HAR 11-20 requires demonstration that the water system can meet the minimum capacity requirements to comply with safe drinking water standards and requirements; completion of an engineering report and approval of the new public water system source; and a source water assessment and preparation of a source water protection plan. In addition, the public water system must be operated by a certified distribution system and water treatment plant operator in accordance with HAR 11-25 "Rules Pertaining to Certification of Public Water System Operators." As an option related to this alternative, Connections could enter into a water development agreement with the county's DWS. Under a water development agreement, the school would be responsible for engineering and developing the well, which would then be turned over to DWS to maintain and operate. DWS would then allocate a portion of the water back to the school.

The project site is not located within a designated water management area; therefore, a Groundwater Use Permit would not be required if a potable well were to be developed. However, a Well Construction Permit and a Pump Installation Permit would be needed from the Commission on Water Resource Management before well construction can begin and before groundwater is developed as a water supply source.

The project's water system would be designed in compliance with all applicable state and county requirements. With adherence to applicable regulations and guidelines the Proposed Action is not expected to adversely impact the existing water supply system servicing the project area and surrounding vicinity.

Wastewater

As discussed in Section 2.1.2 above, Connections intends to implement a biological wastewater system that mimics the cleansing function of wetlands and does not produce toxic bi-products, such as sludge. These types of systems would utilize a combination of septic tanks and a series of biological treatment tanks. The resultant treated water would be of R-2 quality, which could be recycled or could be released safely back into the environment. R-2 water could be used for subsurface irrigation of school yards, athletic fields, and some above ground food crops. Drip irrigation and surface use (with a buffer if spraying) is also allowed under certain conditions for certain non-food plants (e.g., ornamentals, trees, orchards, etc.).

Use of recycled water would reduce the potable water needed to support the project. Its use would comply with DOH's Guidelines for the Treatment and Use of Recycled Water, including the preparation and approval, as needed, of an irrigation plan, a management plan, a public education plan, an employee training plan, a vector control plan, and a monitoring plan. The water reuse project would also require DOH's approval prior to construction.

If it is not economically feasible to implement a biological wastewater and recycled water system, the school can resort to installing a traditional septic system with leach fields or other disposal system as deemed appropriate. In accordance with the DOH guidelines, the project could utilize a maximum 1,000-gallon septic tank for each individual wastewater system (IWS), which would serve the equivalent of a 5-bedroom residential house. For buildings on larger sites, with larger flows, multiple IWS could be used as DOH allows one IWS per 10,000 square feet of land area.

The Proposed Action is not expected to result in wastewater-related adverse impacts. The wastewater systems would be designed in compliance with all applicable DOH Rules (HAR, 11-62, "Wastewater Systems" and HAR 11-55 "Water Pollution Control", as applicable) by licensed professionals in the State of Hawai‘i, and would be installed by licensed contractors. Hawaii's Cave Protection Law does permit septic systems in the vicinity of lava tube caves, provided that they use solid tanks and do not permit sewage flow into the cave. Once operational, the septic system would require maintenance and monitoring to ensure that no accidental releases of raw sewage occurs.

The project site is located within a critical wastewater disposal area (CWDA) with one (1) acre lot exception as determined by the Hawai‘i County Wastewater Advisory Committee. CWDAs

are areas where wastewater disposal has the potential to cause adverse effects to the environment and human health because of hydrogeological conditions. Wastewater systems located in CWDAs may be subject to more stringent requirements that meet higher effluent standards, as determined by DOH's director. Adherence to applicable standards and regulations, and proper maintenance and operation of the system should ensure no significant direct or indirect adverse impacts to the environment or to human health.

Drainage

As a result of the Proposed Action, some existing vegetated areas would be covered with impermeable surfaces, thereby reducing percolation and increasing the volume of surface runoff. However, site improvements would include a drainage system, which may include drywells or detention/retention areas of sufficient capacity to accommodate runoff from impermeable surfaces. Therefore, implementation of the Proposed Action would not significantly increase the flow of stormwater or adversely impact existing storm drainage facilities serving the area.

Under the Proposed Action, existing natural drainage patterns generally would be kept the same. In undisturbed areas, stormwater would be allowed to continue its existing flow patterns. Vegetation would retard surface flow and some of the water will percolate into the porous substrate as it flows across the site. In addition, drainage improvements would be constructed to accommodate surface runoff from paved areas, and if warranted, potential flood water exiting Kaūmana Cave. Drainage improvements would include a network of swales, inlets and drainage lines to direct runoff through the campus, and a series of detention basins. The detention basins would be designed to accommodate on-site runoff by containing the bulk of the flow and allowing it to percolate into the ground and/or to evaporate. Because the underlying ground surface is so porous, the basins would be dry most of the time. The sizes and number of detention basins will be designed when the final engineering plans for the site are developed.

Solid Waste

Currently, Connections has a contract with a private refuse collection service that picks up the solid waste and takes it to the dump. Connections intends to extend their existing contract, and have the same private service collect and dispose of solid waste generated at its new campus.

The Proposed Action would not be a major generator of, and would not result in, significant increases in the accumulation or disposal of solid waste. In addition, Connections intends to promote ecologically sound principals and run a "green" school. The school will implement a comprehensive recycling program that would be a part of daily campus operations. Onsite separation bins for plastic, glass, metal, cardboard, aluminum and paper will be located in food preparation and serving areas, as well as in other appropriate locations throughout the campus.

ALTERNATIVES

Under Alternatives 1, 2 and 3 impacts to existing utility systems would be similar to the proposed action. The No Action alternative would have no effect on existing utilities and infrastructure.

3.9.2 Mitigation Measures

The Proposed Action would not result in significant adverse impacts to existing utilities and infrastructure, and no mitigation measures are required. Furthermore, Connections will be designing their new campus to be a "green" school. Inherent in its design will be numerous environmentally sustainable technologies and strategies that would serve to further minimize any negligible impacts the Proposed Action would have on existing utility and infrastructure systems.

If it is determined that a potable water well needs to be developed, detailed analyses will be conducted to identify any potential adverse impacts to the underlying aquifer and other wells in the vicinity of the project site. If warranted, a Supplemental EA can be prepared to address this specific issue.

3.10 Historic and Cultural Resources

The discussion below regarding the historical perspective and results of the field investigations have been excerpted from two studies, both prepared by Pacific Legacy, Inc. The first study is the Archaeological Assessment Survey of the Connections Charter School Kaūmana Property prepared in 2008. The second study, the Archaeological Field Inspection of Kaūmana Cave was completed in 2010. For additional detailed information, please refer to the full text of these studies which are attached as Appendices E and F, respectively.

Historical Perspective

Research has indicated that there is little evidence of any human activity in the project area during the Pre-Contact period (Pacific Legacy, 2008). At the time of the Māhele ʻĀina in the 1840s (also known as the Great Māhele), two parcels adjacent to the project area were awarded to native claimants. The first parcel was part of an inherited claim to three land areas: Kukuau 2 in Hilo, Waikoloa in South Kohala, and Kiʻilae in South Kona. Because the claim covers such a large area, the document does not have any direct information about the Kukuau parcel (Ibid.) The second parcel, located immediately north of the project area, was claimed by an individual named Kukuleau. This indicates that there was at least some human activity in the area during that period (Ibid.).

Between 1880-1881, a lava flow that originated on the slopes of Mauna Loa passed through the ahupuaʻa of Ponahawai, burying everything in its path. As this flow approached and threatened Hilo, the people of the town called upon Princess Ruth Keʻelikōlani Keanolani Kanōhoahoa for help (Pacific Legacy, 2008). The residents of the threatened community requested that she intercede on their behalf with the volcano goddess Pele, whose fiery flow was threatening their homes. Hawaiian language newspapers of the time reported that Princess Ruth journeyed to the lower edge of the flow where she chanted and made offerings to the goddess. That evening she lay down to sleep in the path of the lava. The next morning the flow had stopped in front of the sleeping princess. Though it spared Hilo, the 1880-1881 flow did inundate the Kaūmana area, including the entire project site (Ibid).

Field Investigations of Surface Area

The entire project area is situated on the 1880-1881 lava flow, and is presently overgrown, vacant, and undeveloped. As a result of the lava flow, it is surmised that any archaeological or

historic sites within the project area would have been destroyed. Consequently, the project site contains very little evidence of any human activity during the Pre-Contact period. During the field investigation, no archaeological sites were encountered and it appears that subsequent to the 1880-1881 flow, permanent human use of the area stopped (Ibid.). Today much of the area surrounding the project site has been subdivided for single family residences.

Field Inspection of Kaūmana Cave

At the request of DLNR's State Historic Preservation Division (SHPD), an archaeological investigation was conducted of the accessible portion of Kaūmana Cave that underlies the project site's upper parcel. One of the purposes of this inspection was to verify previous accounts of historic elements within the cave, which include pectoglyphs (names chipped into the cave's walls) and electrical insulators on the cave walls. Dr. Stone, in his September 4, 2009 comment letter on the original Draft EA for this project, also mentioned there are no burials in the cave and that ti wrapped offerings are left just inside the cave entrance, which is within the county park. The portion of the cave that underlies the project site's lower parcel was not inspected as it is believed to be inaccessible.

The field inspection found an abundance of pecked names near the cave entrance at the county park. Deeper into the cave, the pecked names become more sporadic with occasional dense concentrations. The deepest concentration of names encountered were roughly 850 feet from the cave entrance, which would place this location directly beneath Kaūmana Drive, outside the project site. Beyond that point only two sets of pecked names were noted, both of which appear to be recent. In addition to the pecked names, numerous names have been spray painted onto the cave walls. No names that appear to be older than 50 years were found in the cave segment that underlies the upper parcel. The field inspection also found no evidence of "electrical insulators attached to the cave wall," which were mentioned by Dr. Stone in his comment letter (2009). The inspection report (Pacific Legacy, 2010) concluded that with the exception of the pecked names, no historic elements were encountered in the accessible portion of Kaūmana Cave that underlies the project site. If there were any portable cultural material or human burials in the cave, it likely would have been removed by now or washed away by one of the episodic floods (Ibid.).

Cultural Resources

In the late 1990s, one of the proposed alternative routes for the Puainako Street Extension and Widening project ran directly through the project site. Based upon work performed in support of that project's EIS, no evidence of traditional cultural properties or practices were identified to occur within that project area, which encompasses Connection's project site (Okahara and Associates, 2000). This conclusion was based on several archaeological surveys, archival research, oral interviews and the lack of claimants offering knowledge of such resources.

Findings of the archaeological investigation conducted for the Proposed Action seem to support the conclusions made in the Puainako Street Extension and Widening project EIS. No archaeological surface features were encountered during the investigation. The absence of sites suggests that human activity at the project site has been limited since 1880, with the exception of an occasional pig hunter (Pacific Legacy, 2008).

Further efforts were made to ascertain whether any cultural practices occurred within the project site. Requests for information were sent to the Hawaiian Civic Club of Hilo, the Edith Kanakaole Foundation and Mr. Kepa Maly in an attempt to identify any cultural resources and practices that may be conducted within or around the project site. No responses were received. These request letters are attached as Appendix G. The school also held a public information meeting on April 16, 2009. This meeting was publicized by sending home informational flyers with the Connections' students, posting of informational flyers around the Kress Building and downtown Hilo, and by placing an information bulletin in the Hawai'i Tribune Herald. No persons at the public information meeting spoke in regards to any cultural resources or practices occurring within the project site. Findings of the archaeological investigation, as well as the lack of response for information and public input seem to suggest that the conclusion reached by the Puainako Street Extension and Widening project EIS that there are no traditional cultural practices occurring within the project site are still valid.

3.10.1 Potential Impacts

PROPOSED ACTION

Results of both the archaeological field inspection of the surface area and the field inspection of Kaūmana Cave indicate that no archaeological sites or historic elements were encountered within the project site. The only exception was a few pectoglyphs noted during inspection of Kaūmana Cave. Under the Proposed Action, a lightweight walkway is the only structure being planned for the upper parcel. This walkway would be located beyond the 100-foot protective buffer surrounding Kaūmana Cave. Therefore, it is expected that the Proposed Action would have no significant adverse impact on any historic properties on the surface and within the lave tube. The Proposed Action is also not expected to adversely impact cultural resources or practices.

The Revised Draft EA and Archaeological Assessment Survey, including the Archaeological Field Inspection of Kaūmana Cave, which is attached as an addendum to the original Assessment Survey, was submitted to SHPD for review on August 19, 2010. Documentation of the submittal is attached to this EA as Appendix H. As yet, no comments or determination of effect has been received from SHPD.

ALTERNATIVES

Alternatives 1, 2 and 3 could result in adverse impacts to Kaūmana Cave and thus could affect any historical element, if present, within the cave if project actions caused the cave to collapse. The No Action alternative would have no effect on historic or archaeological resources.

3.10.2 Mitigation Measures

It is unlikely that any historic or cultural artifacts would be unearthed during construction activities. However, it is recommended that an archaeological monitor be on call to inspect any inadvertent find that may be encountered during construction. The following measure shall also be taken per SHPD (letter dated February 17, 2009): "In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, Hawai'i Island Section needs to be contacted immediately."

3.11 Visual, Aesthetic and Recreational Resources

The natural beauty of the South Hilo district is dominated by Mauna Kea and Mauna Loa. Views of the mountains are possible from various locations throughout the area. The project area is located on the lower slopes of Mauna Loa, inland of the town of Hilo. There are some locations within the project site that may have views of Hilo Bay or Mauna Kea, depending on whether the vegetation is thinned or entirely removed. The site is not readily visible from Hilo Bay and it would be difficult to locate and spot from this area.

Kaūmana Cave and the county's Kaūmana Cave Park are well-known recreational resources in the near vicinity to the project site. The park and the cave are publicized in visitor guides and is visited frequently by visitors and locals alike.

3.11.1 Potential Impacts

PROPOSED ACTION

The campus plan is composed of several small, single-story buildings clustered along an arcing pattern situated near the middle of the lower parcel. This layout would provide for a small vegetative belt surrounding the campus, which could consist of a combination of existing vegetation and reforested areas. The vegetative belt would help to blend the campus with the surrounding rural landscape and serve as a visual buffer between the school and the surrounding residential areas. As such, the location and operation of the new campus is not expected to result in significant adverse impacts on visual and aesthetic resources in the area.

Along the upper parcel, the proposed walkway would be hidden amidst the existing ʻōhiʻa forest, which would remain largely intact. Thus this too would result in no significant adverse impacts to visual and aesthetic resources.

The Proposed Action is not expected to result in adverse impacts to any recreational resource. The Kaūmana Caves Park is outside the project site and implementation of the Proposed Action would in no way restrict any use of the park, including the portion of the Kaūmana Cave that is within park boundaries. The portion of the Kaūmana Cave that underlies the project site is state property. Entry to this portion of the cave is not prohibited; however, visitors to this portion of the cave should be obtaining a right-of-entry from DLNR. Implementation of the Proposed Action is not expected to change these conditions, as development would be limited to the surface area and beyond a 100-foot buffer, as measured from the edges of the cave walls.

ALTERNATIVES

In contrast to the Proposed Action, Alternatives 2 and 3 would involve considerable clearing of the upper parcel's ʻōhiʻa forest. This would not only increase the visibility of the campus from nearby residences, but would also reduce the amount of ʻōhiʻa forest, which could be considered a visual and aesthetic resource. While Alternative 1 also proposes to develop major school facilities on the upper parcel, this scheme would place the buildings in a linear fashion down the middle of the parcel. This would serve to retain a substantial amount of forested area between school facilities and nearby residence resulting in lesser impacts to visual and aesthetic resources. The No Action alternative would have no effect on visual and aesthetic resources.

3.11.2 Mitigation Measures

No mitigation is warranted or proposed.

3.12 Circulation and Traffic

Existing Conditions

Existing traffic volumes in the project area are low and there are no signalized intersections in the immediate vicinity of the project site. The two primary circulation routes within the immediate vicinity of the project site are Kaūmana Drive located northwest of the site, and Edita Street, which bisects the site dividing it into its upper (western) and lower (eastern) halves. Kaūmana Drive (Rte 200) is a two-way road, with an east-west orientation. It is the main roadway serving the Kaūmana area, connecting it to Hilo town to the east, and Saddle Road to the west. The County of Hawai'i public transportation bus service (*Hele On*) runs along Kaūmana Drive. Edita Street is a two-lane, two-way road which intersects with Kaūmana Drive, extending in a north-south orientation through the middle of the project site.

Level-of-Service Concept

Level of Service (LOS) is a qualitative measure to describe the flow or operational characteristics of traffic as perceived by the level of congestion or delays experienced by motorists. There are six grades of LOS measured from "A" to "F". In general, LOS A is considered best, representing free-flow conditions with no congestion. LOS F is considered worst, representing severe congestion with stop-and-go conditions. For peak hour traffic conditions in urban areas the minimum acceptable LOS is D. LOS grades A through F are summarized in Table 3-2.

Table 3-2. Level-of Service Descriptions and Time Delays(1)

Level-of-Service	Description	Time Delay (in seconds)
A	Little or no delay	< 10
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays(2)	> 50.1

Source: Excerpted from Traffic Impact Analyisis Report (Rowell, 2010)

Notes:
(1) Definitions for Unsignalized Intersections from the Institute of Highway Engineers, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. LOS F conditions usually warrant improvement of the intersection.

Existing traffic volumes in the project area are low and the adjacent roadways currently operate at LOS A or B. This implies good operating conditions, minimal delays, and high levels-of service. The existing levels-of-service for project area roadways is presented in Table 3-3.

Table 3-3. Existing Levels-of Service

Intersection, Approach and Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
Kaumana Drive at Edita Street						
Southbound Left & Thru	7.8	A	7.6	A	7.5	A
Westbound Left	10.9	B	10.4	B	10.7	B
Westbound Right	9.8	A	9.2	A	8.9	A

Source: Excerpted from Traffic Impact Analyisis Report (Rowell, 2010)

Notes:
(1) LOS calculated for unsignalized intersections
(2) Delay is in seconds per vehicle

3.12.1 Potential Impacts

A Traffic Impact Analysis Report (TIAR) was prepared in support of this EA. The TIAR assessed future impacts of the Proposed Action on the local traffic and circulation patterns. The TIAR study methodology consisted of conducting an analysis of existing traffic conditions, determining future background traffic projections, and identifying future project-related traffic impacts based on the Proposed Action phasing presented in Section 2.1.3. The impact analysis presented in this section is based on the findings of the TIAR which has been attached as Appendix I.

PROPOSED ACTION

Under the Proposed Action, primary access to and egress from the project area would be via the intersection of Kaūmana Drive at Edita Street. Access to and egress from the campus from Edita Street would be provided by a new driveway into the lower parcel (referred to as Road "D"in the traffic report).

Traffic-related impacts of the proposed project involved the determination of project-generated traffic during the morning (AM), midday (end of school day), and afternoon (PM) weekday commuter peak period and the determination of the levels-of-service at affected roadway intersections subsequent to implementation of the project. The proposed project would generate 108 inbound and 79 outbound trips during the morning peak hour, 52 inbound and 72 outbound trips during the midday peak hour and 31 inbound and 30 outbound trips during the afternoon peak hour. The total number of peak hour vehicle trips generated by the completed project during a weekday would be 621, of which 187 would be generated during the AM peak hour, 124 during the Midday peak hour, and 61 during the PM peak period (Rowell, 2010). Projected trip generation rates for the proposed action, broken down by development phase, are presented in Table 3-4 below.

Table 3-4. Trip Generation for the Proposed Action

Time Period		Number of Trips Generated						Total Project Trips
	Direction	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
Weekday	Total	8	10	183	388	0	32	621
AM Peak Hour	Total	4	1	44	127	0	11	187
	In	2	0	30	70	0	6	108
	Out	2	1	14	57	0	5	79
Midday Peak Hour	Total	4	0	34	79	0	7	124
	In	2	0	12	35	0	3	52
	Out	2	0	22	44	0	4	72
PM Peak Hour	Total	0	1	15	41	0	4	61
	In	0	1	7	21	0	2	31
	Out	0	0	8	20	0	2	30

Source: Excerpted from Traffic Impact Analyisis Report (Rowell, 2010)

Based on the traffic generation data, a Level-of-Service analysis was performed. The LOS analysis concluded that the majority of vehicular approach and movement patterns on adjacent public roadway intersections and proposed internal campus driveways would experience little or no delays after full buildout of the Proposed Action in the year 2022. The LOS analysis projects that traffic movements in the project area would continue to operate at LOS A and B, with over 73 percent of all movements operating at LOS A and 27 percent of movements operating at LOS B (Rowell, 2010)

Based on the findings of the TIAR, construction and operation of the Proposed Action would not generate large increases in traffic volumes and would not result in adverse impacts to traffic and circulation patterns in the project area. A summary of the peak hour level-of-service for the Proposed Action and alternatives are presented in Table 3-5

ALTERNATIVES

Similar to the Proposed Action, Alternatives 1, 2 and 3 would not generate large volumes of traffic, and traffic movements would operate at LOS A or B (Table 3-5). Therefore, Alternatives 1, 2 and 3 would not result in adverse impacts to traffic and circulation patterns in the project area. The No Action alternative would have no impact on the existing or future circulation and traffic patterns.

Table 3-5. Future Peak Hour Levels-of-Service (Year 2022)

Approach and Movement	Existing (2009)		2021 Background		2022 Alternative 1		2022 Alternative 2		2022 Alternative 3		2021 Preferred Alternative	
	Delay[2]	LOS[3]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
AM Peak Hour [1]												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.8	A	7.8	A	8.2	A	8.1	A	8.1	A	8.2	A
Westbound Left	10.9	B	11.2	B	14.3	B	14.1	B	14.0	B	14.3	B
Westbound	9.8	A	10.0	B	10.7	B	10.6	B	10.6	B	10.7	B
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.4	A	7.4	A	7.4	A		
Westbound Left, Thru & Right					7.5	A	7.3	A	7.3	A		
Northbound Left, Thru & Right					10.0	B	10.3	B	10.2	B		
Southbound Left, Thru & Right					8.6	A	8.7	A	8.7	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.8	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		10.3	B		
Edita Street at Road D												
Eastbound left & Thru											7.6	A
Southbound Left & Right											9.0	A
Midday Peak Hour												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.6	A	7.6	A	7.8	A	7.7	A	7.7	A	7.8	A
Westbound Left	10.4	B	10.5	B	11.9	B	11.7	B	11.8	B	11.9	B
Westbound	9.2	A	9.2	A	9.7	A	9.6	A	9.6	A	9.7	A
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.3	A	7.4	A	7.3	A		
Westbound Left, Thru & Right					7.5	A	7.5	A	7.3	A		
Northbound Left, Thru & Right					9.8	A	9.9	A	9.9	A		
Southbound Left, Thru & Right					8.5	A	8.6	A	8.6	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.7	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		9.2	A		
Edita Street at Road D												
Eastbound left & Thru											7.4	A
Southbound Left & Right											8.9	A
PM Peak Hour												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.5	A	7.5	A	7.7	A	7.6	A	7.6	A	7.7	A
Westbound Left	10.7	B	10.8	B	11.6	B	11.5	B	11.6	B	11.6	B
Westbound	8.9	A	9.0	A	9.2	A	9.1	A	9.1	A	9.2	A
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.4	A	7.3	A	7.3	A		
Westbound Left, Thru & Right					7.3	A	7.3	A	7.3	A		
Northbound Left, Thru & Right					9.9	A	9.3	A	9.3	A		
Southbound Left, Thru & Right					8.5	A	8.5	A	8.5	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.7	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		9.0	A		
Edita Street at Road D												
Eastbound left & Thru											7.4	A
Southbound Left & Right											8.6	A

NOTES:
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the project.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.
4. This intersection will be constructed as part of the project

3.12.2 Mitigation Measures

Because all traffic movements are expected to operate at LOS A or B, no mitigation is required. However, in order to minimize any potential effects to traffic and circulation in the project area, it is recommended that Connections implement some traffic controls. These traffic controls include, but are not limited to the following:

- Since trip generation rates for the area may change over the next decade, additional traffic surveys should be performed upon completion and occupancy of Phase 3, Phase 4 and Phase 6 to confirm the trip generation analysis and that the study intersections are operating as predicted. If these surveys determine that additional mitigation measures are needed, the appropriate improvements should be identified and implemented.
- A Traffic Management Plan (TMP) should be developed to promote ridesharing strategies such as carpools by students and employees, and use of alternative modes of transportation such as buses and bicycles. There is an existing Hele On bus route along Kaūmana Drive, however, as part of the TMP, coordination with the Hele On bus system should be initiated to ensure public bus service to and from the new campus.
- Alternative modes of transportation for internal trips within the project site should be encouraged, including the use of bicycles, golf carts, etc. Adequate parking facilities for these alternative modes of transportation should be provided.

3.13 Socio-Economic Considerations

The County of Hawai‘i and the city of Hilo have a rather diverse ethnic background with no clearly discernable racial majority or minority. Hilo and Hawai‘i County, in general, have a diverse population and is among the 100 fastest growing counties in the United States. The median family income is less than 65 percent of that of the Country as a whole, with over 15 percent of individuals with income levels below the federal poverty level (U.S. Bureau of the Census, 2001). The socio-economic characteristics for Hawai‘i Island and for Hilo are summarized below in Table 3-6.

Table 3-6. Socio-Economic Characteristics

Characteristic	Island of Hawaii	Hilo
Total Population	148,677	40,759
Percent Caucasian	31.5	17.1
Percent Asian	26.7	38.3
Percent Hawaiian	26.7	13.1
Percent Mixed (two or more races)	28.4	29.7
Median Age (Years)	38.6	38.6
Percent Under 18 Years	26.1	24.7
Percent Households with Children	23.1	36.1
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. 2001. Profiles of Demographic Characteristics, 2000 Census of Population and Housing, Hawaii (U.S. Census Bureau Web Page)

The student population at the Connections school generally reflects the ethnic and racial diversity of the general population. As a public charter school Connections will continue to provide an educational opportunity for students from all economic levels.

3.13.1 Potential Impacts

PROPOSED ACTION

The Proposed Action is not expected to increase the county's resident or visitor populations. Positive short-term economic impacts would be generated during the project construction phase including jobs, local purchases of goods and services, and procurement expenditures associated with supplying and maintaining the new facility. The Proposed Action is not expected to result in a major increase in permanent employment.

The proposed project would result in beneficial social impacts by improving educational services and opportunities for Hilo's children by providing a culturally and environmentally-sensitive learning environment. Construction of a new campus would allow Connections to continue teaching at its high educational standard and their proposed agricultural program would provide local children with marketable skills for working in and developing small sustainable agricultural operations in the area.

ALTERNATIVES

Alternatives 1, 2 and 3 would result in similar beneficial socio-economic impacts as the Proposed Action. The No Action alternative would have no effect on the existing socio-economic conditions.

3.13.2 Mitigation Measures

No mitigation is warranted or proposed.

3.14 Cumulative Impacts

Cumulative impacts on environmental resources can result from the incremental effects of given development when evaluated in conjunction with other past, present and reasonably foreseeable public and/or private future actions. A given action may have minimal impacts when considered individually, but when considered in combination with other actions it could result in adverse environmental impacts. Most past, present, and future actions in the surrounding area involve the development of sites for single-family residences. However, the timing and even the certainty of many of these projects is unknown, therefore potential cumulative impacts are difficult to assess.

The Proposed Action involves the relocation of a school that is currently serving the Hilo/Puna community, and it is not anticipated to result in major secondary or cumulative impacts. From a regional perspective, impacts are limited to the planned growth of the school, including a potential pre-Kindergarten program. From a local perspective the Proposed Action would have noticeable, but negligible, cumulative effects on the existing residential areas, largely due to the operation of a new school campus on a presently undeveloped site, and the associated increase in vehicular traffic volume. However, as discussed in Section 3.12.1, cumulative traffic growth was

considered in the TIAR analysis and the findings indicated that the proposed project would not result in significant adverse traffic impacts.

The project will provide short-term construction jobs that will be filled by local residents but would not induce in-migration. The Proposed Action would likely have beneficial effects on socio-economic resources by improving educational services and opportunities for area residents and by enhancing access to educational opportunities and providing a culturally and environmentally sensitive learning environment.

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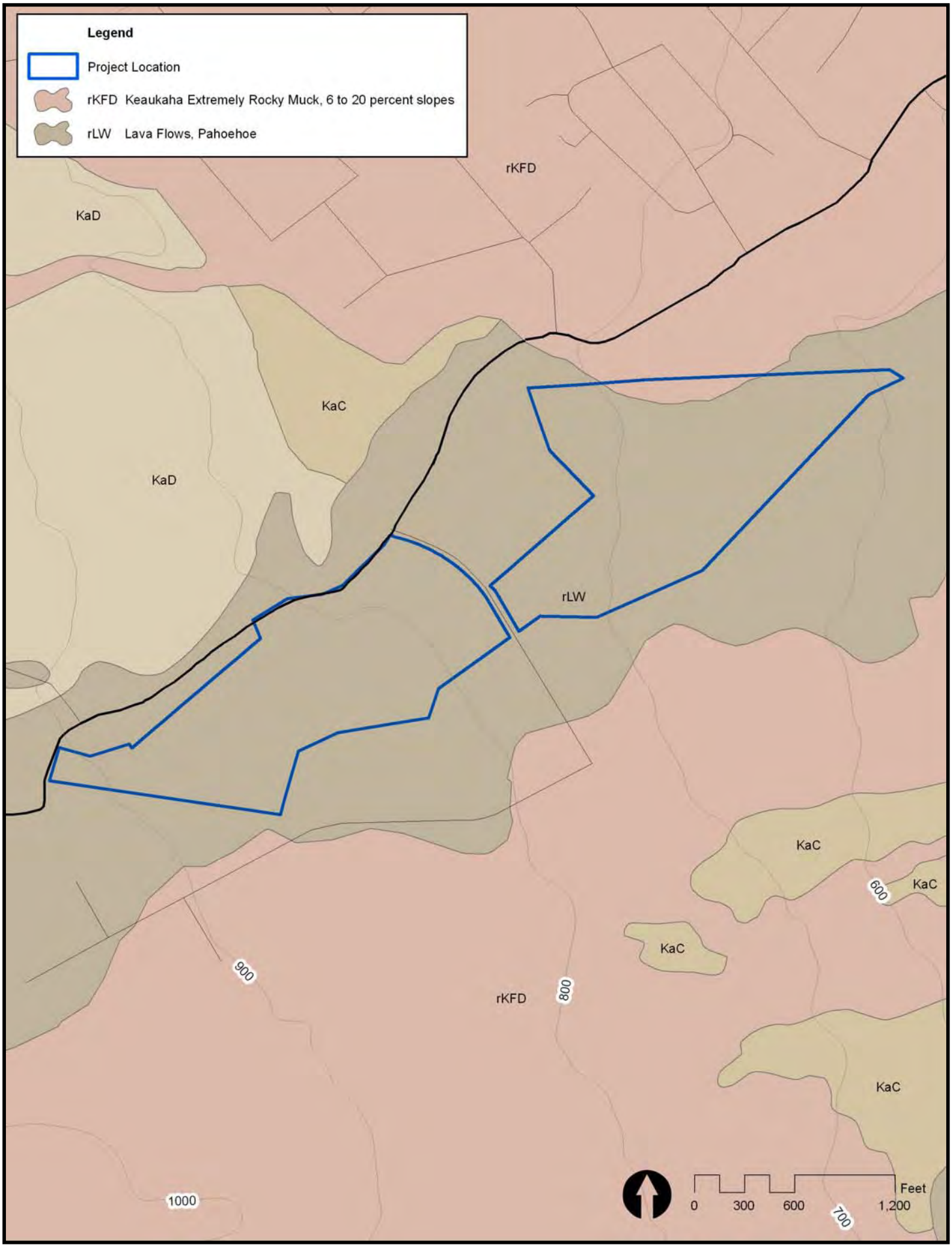

TOPOGRAPHY AND SOILS ***FIGURE 3 – 1***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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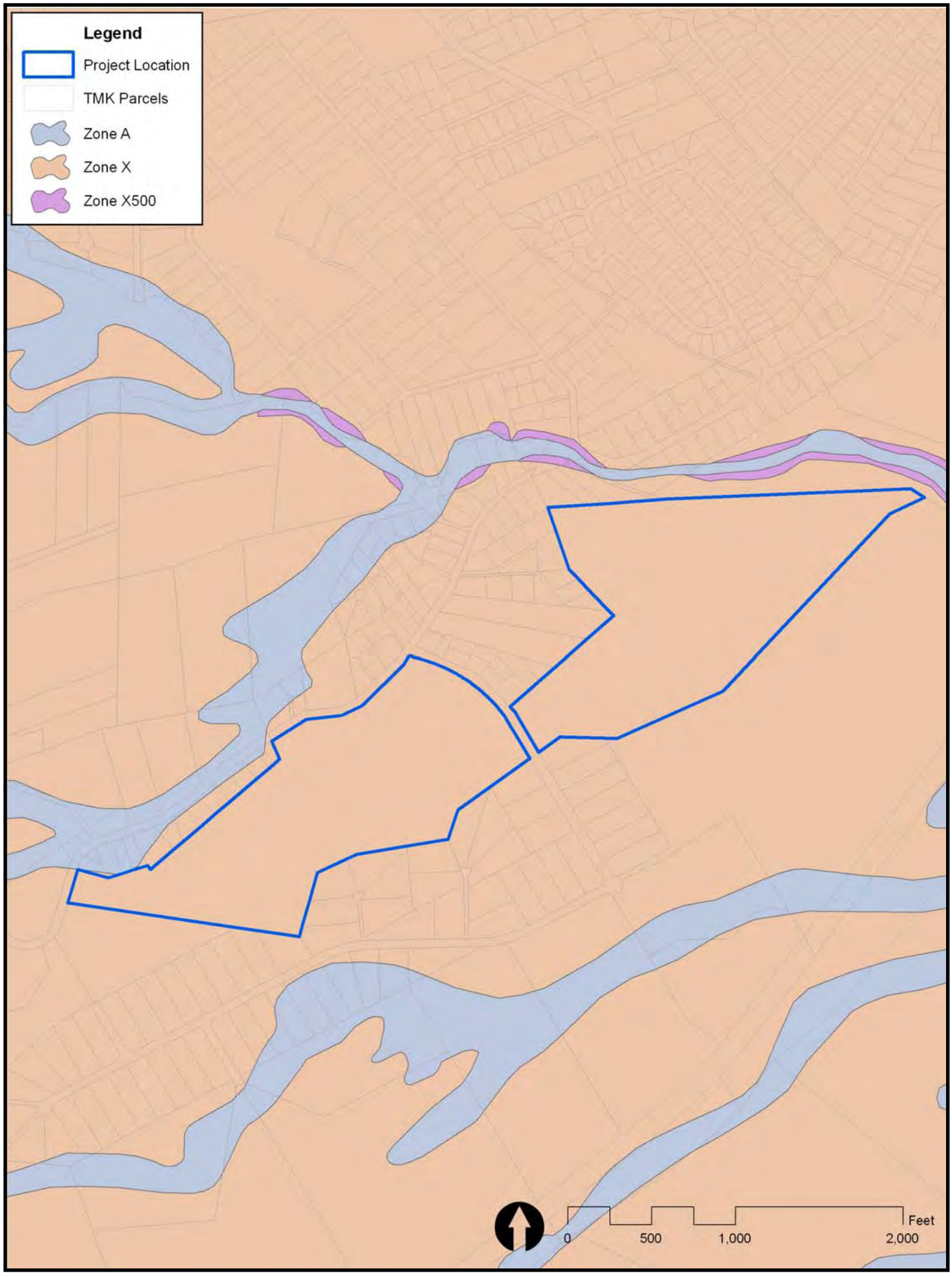

FLOOD HAZARD ***FIGURE 3 – 2***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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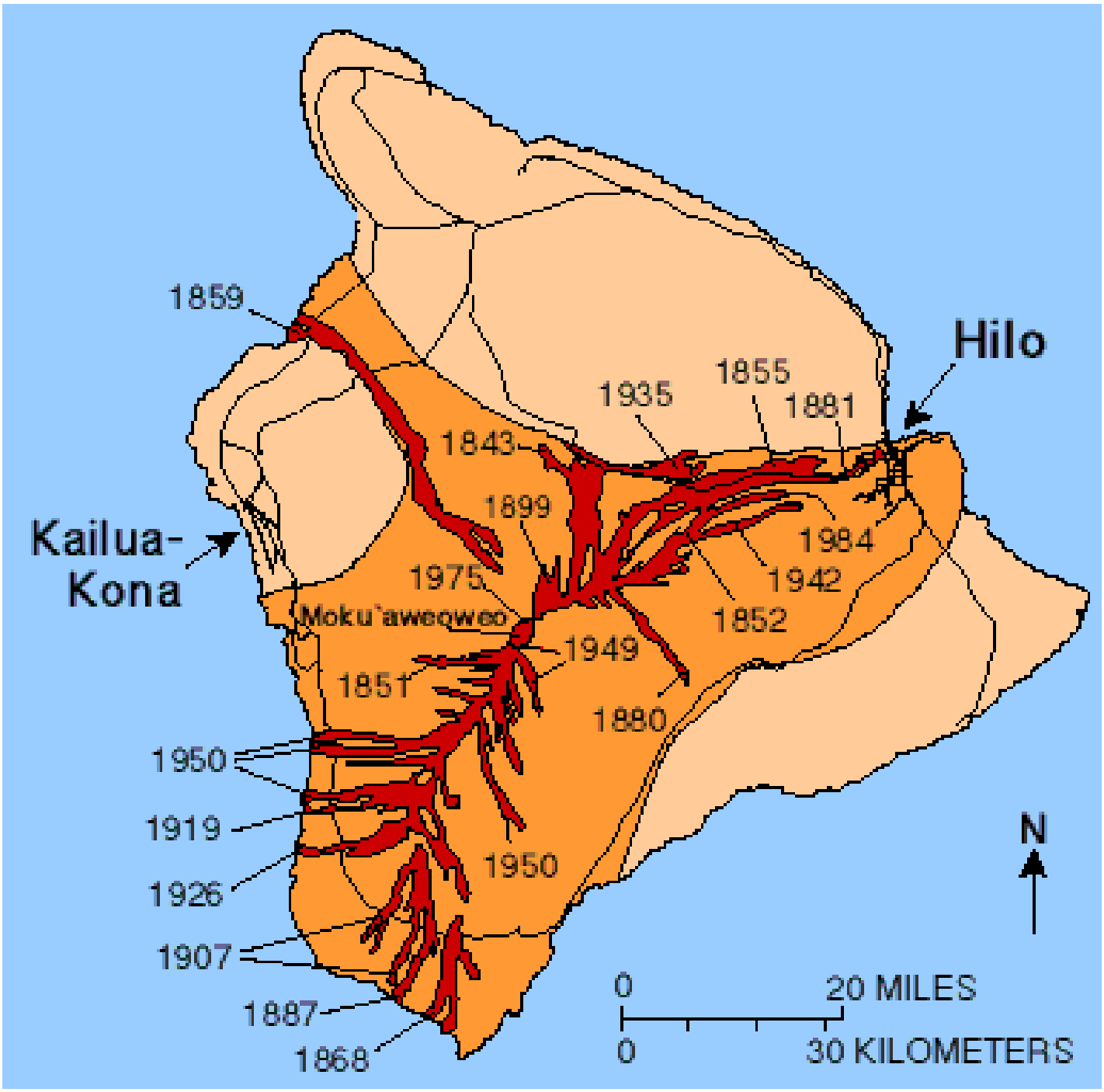

Source: U.S. Geological Survey

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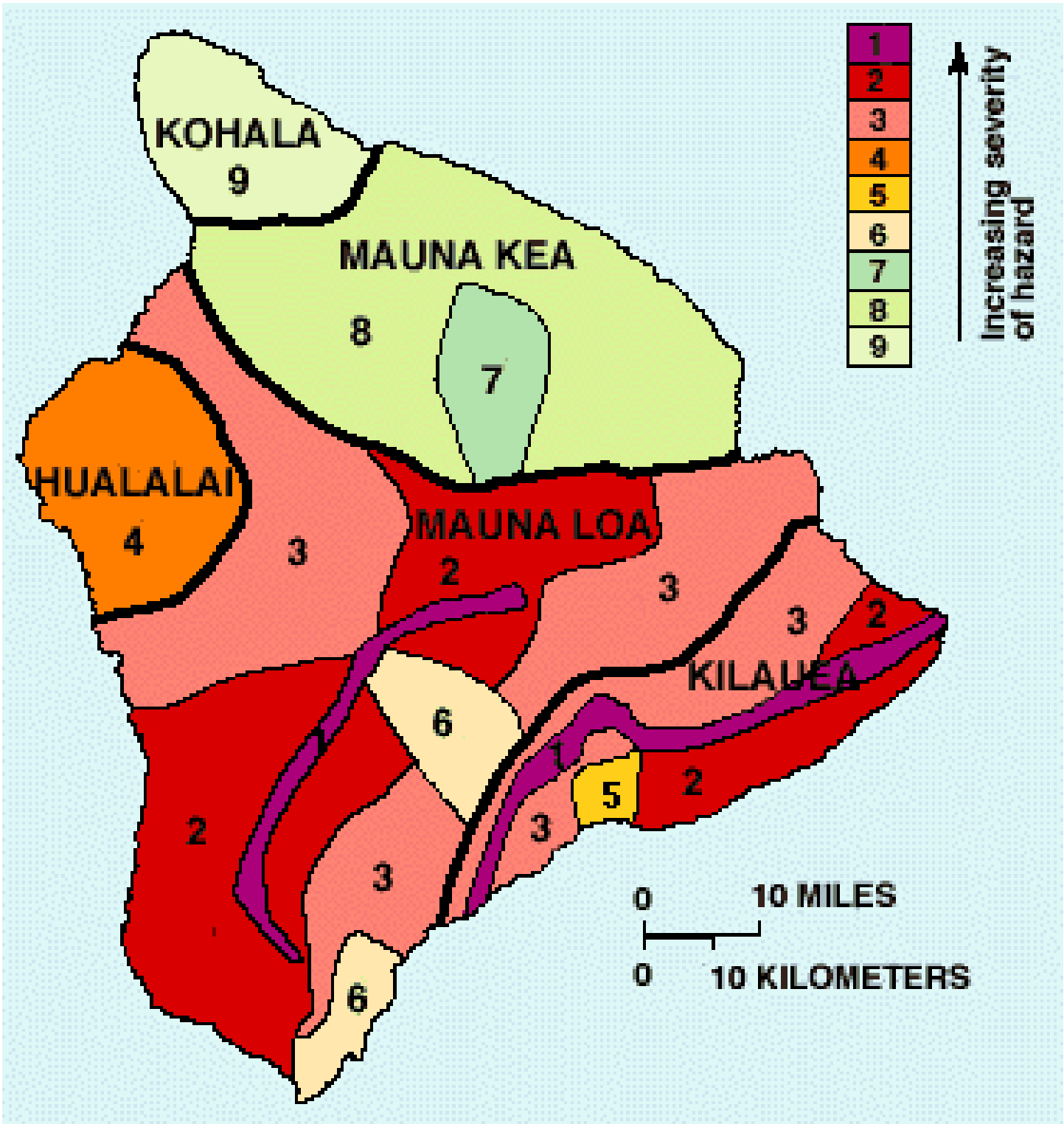

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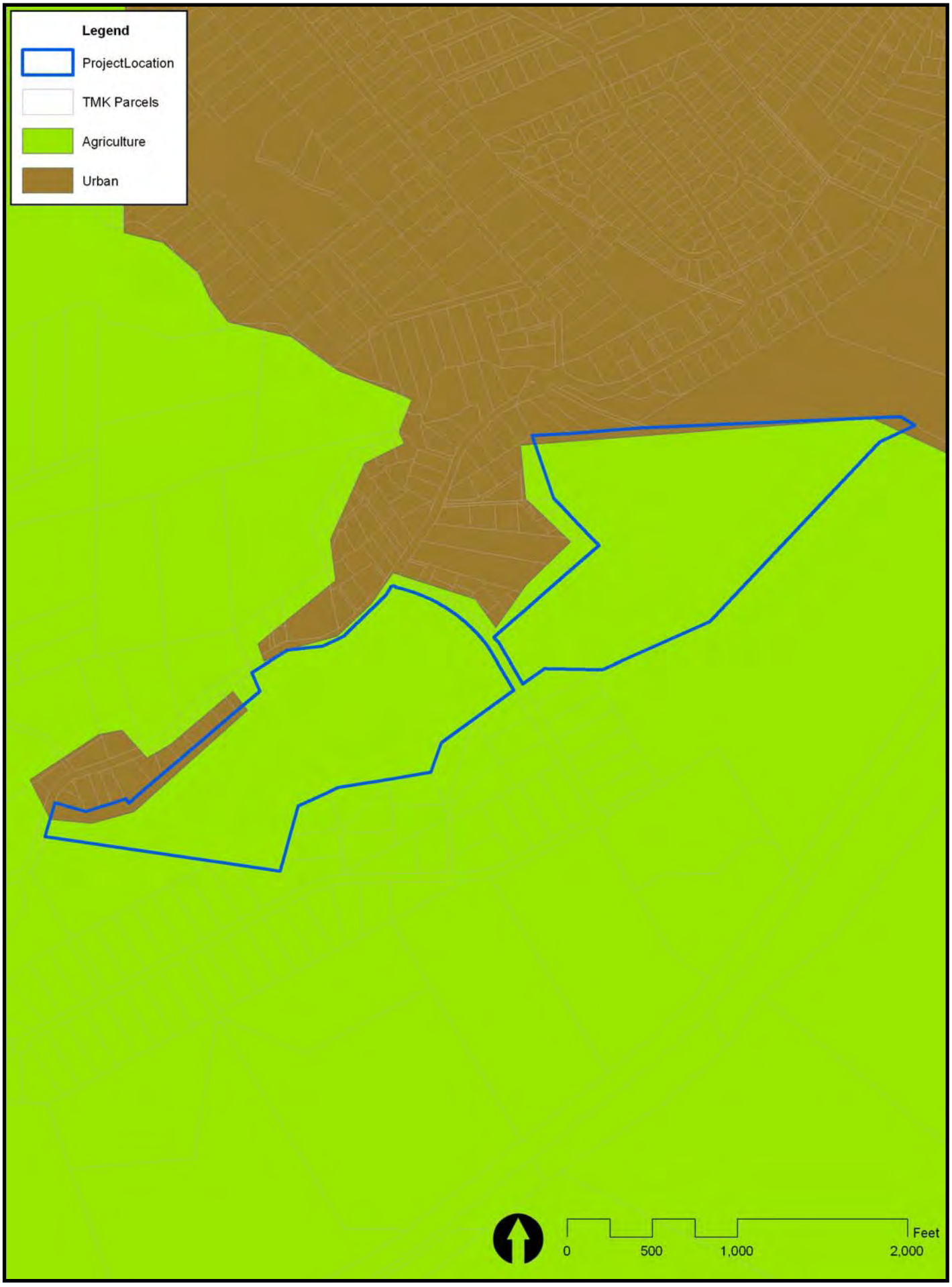

STATE LAND USE DESIGNATION ***FIGURE 3-5***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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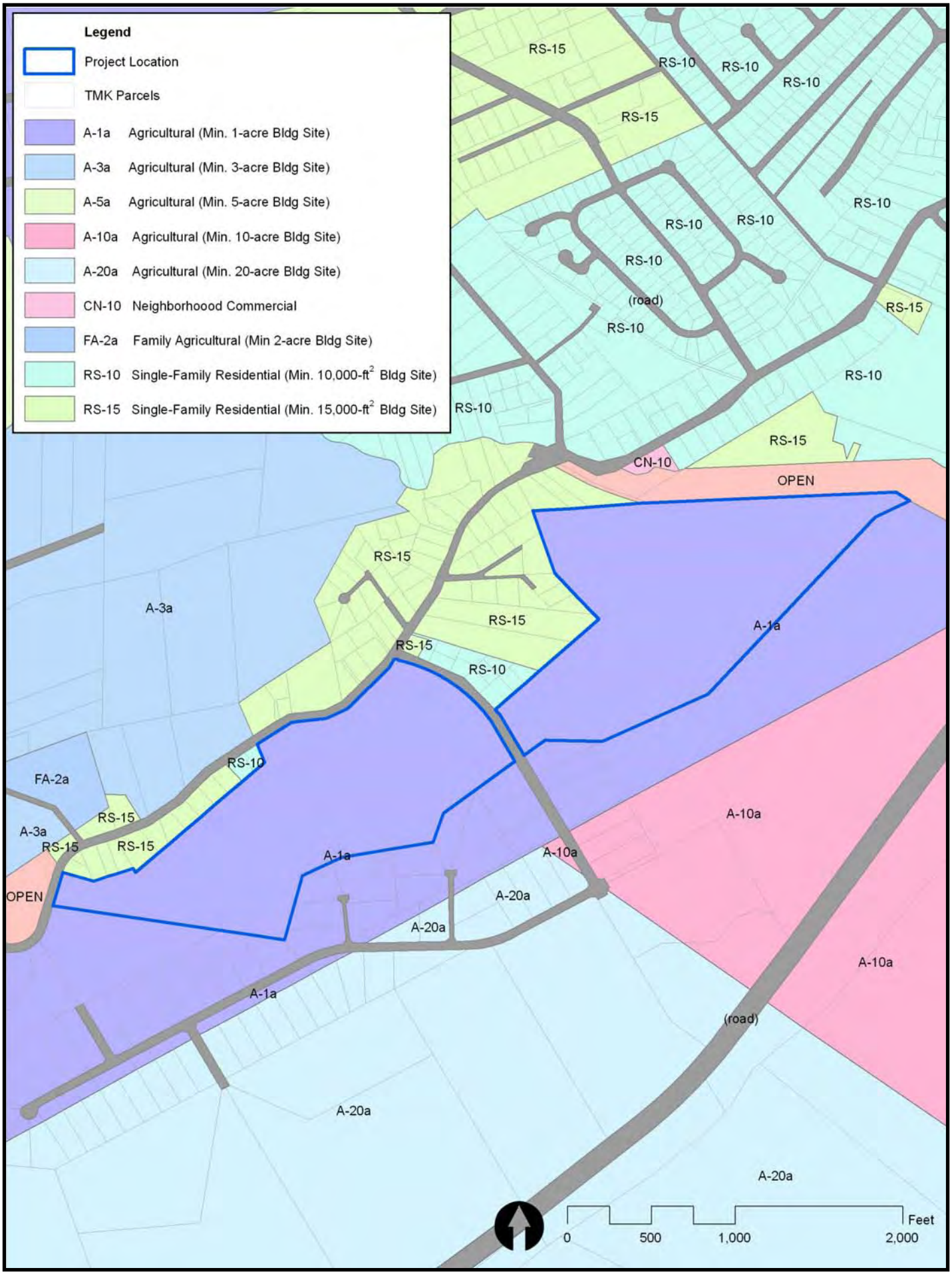

COUNTY ZONING ***FIGURE 3-6***

Final EA – Connections Public Charter School Kaumana, South Hilo, Hawai'i

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4.0 CONSISTENCY WITH GOVERNMENT PLANS, POLICIES AND CONTROLS

4.1 State Land Use Law

All lands within the State of Hawai‘i are classified into one of four land use districts – Urban, Rural, Agriculture, or Conservation – by the State Land Use Commission pursuant to Chapter 205, HRS. The project site lies within the State Land Use Agriculture District and would require Land Use Commission approval of a Special Permit for a new non-conforming use.

4.2 State of Hawai‘i Environmental Policy

Chapter 344, HRS, the State Environmental Policy, encourages productive and enjoyable harmony between people and their environment. The policy promotes efforts which would prevent or eliminate damage to the environment and biosphere, stimulate the health and welfare of humanity, and enrich the people of Hawaii’s understanding of ecological systems and natural resources. The Environmental Policy seeks to conserve natural resources and enhance the quality of life for residents of Hawai‘i. Expanding citizen participation in the decision-making process is one of the guidelines specified in Chapter 344, HRS. During the consultation process for this EA, comments were solicited from federal, state, and county agencies; public utilities; private interests; and other potentially interested parties (presented in Appendices A, B and C).

4.3 Hawai‘i State Plan

Adopted in 1978 and revised in 1991 (HRS Chapter 226 as amended) the Hawai‘i State Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-term growth and development activities. The three themes that express the basic purpose of the Hawai‘i State Plan are individual family self-sufficiency, social and economic mobility, and community or social well-being. The Proposed Action would promote these goals by enhancing elementary middle and high school educational facilities in the Hilo and Kaūmana area thus enhancing the quality-of-life, community and social well being of the region.

4.4 Hawai‘i County General Plan

The General Plan for the County of Hawai‘i is a policy document that expresses 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). It is divided into thirteen elements with policies, objectives, standards, and principles applicable to each element. Goals, Policies, and Courses of Action identified in the General Plan that are pertinent to the proposed action include:

<u>Education Goals</u>

- Each Charter school is responsible for selecting their own sites.
- Utilize publically owned lands in the best public interest and to the maximum benefit.

Education Policies

- Encourage continuous joint pre-planning of schools with the Department of Education.
- Ensure coordination with roads, water and other support facilities and considerations such as traffic safety, and access for vehicle, bicycle and pedestrians.
- Encourage master planning of present and proposed public and private institutions.
- Encourage combining school yards with county parks and allow school facilities for afterschool use for recreational, cultural and other compatible uses.

Education Courses of Action

- Encourage the establishment of additional schools as the need arises.
- Encourage continual improvements to existing educational facilities.

4.5 County Zoning

The project site is zoned A-1a (General Agricultural) by the County of Hawaii. In accordance with the County Zoning Code, schools are an allowable use within the A-1a district with an approved County Use Permit. However, as noted in Section 4.1 above, the project site is also located within the State Land Use Agricultural District; therefore a Special Permit, pursuant to HRS 205, rather than a Use Permit would be required to implement the proposed project.

4.6 Hawai‘i Cave Protection Law

The purpose of the Hawai‘i Cave Protection Law is to protect the unique cultural and natural resources found in Hawaii’s caves. As a known and previously identified cave, Kaūmana Cave is covered by this law. The Proposed Action would be implemented in conformance with all applicable provisions of the Cave Protection Law. The Proposed Action would maintain a minimum 100-foot buffer, as measure from the outer edges of the cave. With adherence to this buffer, it is anticipated that the Proposed Action would result in no significant adverse impacts on Kaūmana Cave. For previously unknown caves that are encountered during a normal construction context, the provisions of this law do not apply, provided that the protective and mitigation measures identified during the environmental review process and permitting conditions are followed.

5.0 FINDINGS AND DETERMINATION

5.1 Significance Criteria

This EA evaluates the impacts that potentially could result from implementing the Proposed Action. Short- and long-term impacts were looked at, as well as direct, indirect, and cumulative impacts. Potential impacts were evaluated against the criteria contained in §11-200-12 of the DOH rules relating to Environmental Impact Statements. Mitigation is proposed where appropriate.

1. *The proposed project will not involve an irrevocable commitment, loss or destruction of any natural or cultural resources.*

No natural or cultural resources would be committed or lost. Some vegetation removal would be needed to develop the school campus; however, the biological survey concluded that there is nothing unique about the project site. There is an abundance of similar habitats in, and around Hilo. Further there is no federally delineated Critical Habitat within or near the project site. An archaeological field inspection of the surface area and the field inspection of Kaūmana Cave encountered no archaeological/cultural sites or historic elements within the project site that would be adversely impacted by the project.

2. The proposed project will not curtail the range of beneficial uses of the environment.

The Proposed Project would not curtail any beneficial use of the environment. The project site is currently undeveloped and no recreational or cultural uses of the site have been identified, except for the occasional pig hunter. Due to the redesign of the campus to avoid Kaūmana Cave, it is expected that this environmental resource would not be impacted by the Proposed Action. Further, Connections has no intention of limiting other people's access to the cave for recreational, research, and educational purposes. This is particularly true when considering the proposed sustainable agriculture program that Connections is proposing to implement upon securing the long-term lease to the property.

3. The propose 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 the policy are to conserve natural resources and enhance the quality of life. This project fulfills aspects of these policies by providing by providing the local community with modern educational facilities, thus enhancing the community's quality of life. As a "green" project, development of the new Connections campus will satisfy the intent of these policies by, among other things, reducing potable water demand through the use of water efficient fixtures, a rainwater catchment system and recycled water; reducing electrical demand by use of photovoltaics and other energy reduction features; and designing the facilities to minimize disruption to the native forest.

4. *The proposed project will not substantially affect the economic or social welfare of the community or state.*

The Proposed Action is not expected to have any adverse socio-economic effects. On the contrary, over time the Proposed Action should result in beneficial impacts to the social welfare of the community by providing a unique educational opportunity for the community's children and by providing design and construction jobs for local residents.

5. The proposed project does not substantially affect the public health in any detrimental way.
The Proposed Actions would have no detrimental effects on public health. Adherence to all applicable regulations and guidelines in designing, constructing and operating the rainwater catchment system, wastewater system, and recycled water system should ensure that public health would not be adversely affected.

6. The proposed project will not involve substantial secondary impacts such as population changes or effects on public facilities.
No secondary effects are anticipated to result from the Proposed Action, which would improve educational facilities in the Hilo area. The Proposed Action would not induce in-migration or adversely affect public facilities.

7. The proposed project will not involve a substantial degradation of environmental quality.
Connections intends for their new campus to be a model of sustainability. As mandated by the State, the project would need to be certified as LEED Silver; however, the goal is to obtain a higher LEED rating (i.e., gold or platinum). Project features that reduce greenhouse gas emissions, reduce energy use, and reduce potable water consumption in combination with utilization of alternative energy and water sources would all contribute to minimizing any potential degradation of environmental quality. Further low impact development strategies would be implemented to reduce and manage runoff from the site. Therefore, the Proposed Actions is expected to be environmentally benign and would not contribute to any substantial environmental degradation.

8. The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.
It is expected that the construction or operation of the Proposed Action would not result in deleterious impacts to native plant or animal species within the general project area. There are no protected, rare, or endangered plant species with the project site. Further, there is nothing unique about the project site or its vegetation and there is abundant like habitat in, and around Hilo. During a biological survey of the project site none of the following species were observed, although they are known to be in the general area: Hawaiian Hoary Bats, Hawaiian Hawks, Hawaiian Petrels or Newell's Shearwaters.

The following summarizes protective measures to minimize any potential impacts to the Hawaiian Hoary Bat, the Hawaiian Hawk, the Hawaiian Petrel, and Newell's Shearwater. These measures are discussed in detail in Section 3.5.2 above.

- Clearing and grubbing not be undertaken during the Hawaiian hoary bats' birthing and pup rearing season. If clearing is to be conducted during this period, a survey should be conducted to verity if bats are present.
- Tree clearing should be avoided during the Hawaiian Hawks' breeding season from March to September. If clearing must be conducted during this period, a survey should be conducted to verify if any Hawaiian Hawks are present.
- To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting be shielded.

9. *The proposed project is not one, which is individually limited but cumulatively may have considerable effects 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 TIAR.

10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.*

No adverse effects on these resources will occur. Adherence to applicable regulations, construction site BMPs and permit conditions should prevent any adverse impacts to water, air and noise quality. Disturbance during the construction phase would be temporary and limited to reasonable daytime hours. Runoff would be controlled to prevent any water quality issues.

11. *The project does not affect or 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 waters.*

The project site is located in an area with volcanic and seismic risks, as is the entire Island of Hawai‘i. The Proposed Action would construct and employ design and construction standards appropriate for the seismic zone. Currently, there are no mitigation measures for volcanic hazards that have proven to be effective. While the project site is not located in a flood plain or a FEMA-designated flood zone, it may be subject to occasional flooding from Kaūmana Cave. These instances are rare and protective design features would be incorporated into the project. Such features could include diverting surface runoff away from buildings and into detention basins or drywells and designing facilities to be elevated above ground level. Specific and appropriate project features will be identified during the design development phase of the project. The project site is not located in any other environmentally sensitive area.

12. *The project will not substantially affect scenic vistas and view planes identified in the county or state plans or studies.*

No scenic view planes identified in the Hawai‘i County Plan would be adversely affected by the project. Further, the buildings would be single story and small in scale. Vegetation (e.g., trees and shrubs) would be used as a visual buffer so that school facilities would not be glaringly noticeable from public streets.

13. *The project will not require substantial energy consumption.*

Initial construction of the facility will require additional consumption of energy. In the long-term, once the campus is built, sustainable design features would reduce energy consumption during operation of the school facilities. Alternative energy sources such as wind and photovoltaics are being considered and would be installed if economically feasible. There would be no long-term adverse effects on the existing energy utilities servicing the area.

5.2 Determination

Based on the evaluation contained in this EA, DLNR does not anticipate that the Conceptual Master Plan for Connections Public Charter School would result in significant adverse impacts to the existing natural or human environment. Therefore, DLNR has issued a Finding of No Significant Impact for the master plan.

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6.0 CONSULTATION AND COORDINATION

In an effort to solicit comments on the Proposed Action, pre-assessment informational letters were sent to the government agencies and private organizations identified in Appendix A. Response letters that were received are reproduced in Appendix A as well. Thirteen responses letters were received.

The original Draft EA was distributed for agency and public comment in August 2009. The distribution list and reproductions of the comment letters and responses are attached in Appendix B. Fourteen agency response letters and five individual response letters were received. Due to the nature of the comments received regarding potential impacts to Kaūmana Cave, it was decided that the most prudent course of action was to reconfigure the campus plan to avoid the cave and any potential impacts.

This Revised Draft EA assesses the potential impacts of the reconfigured campus plan and is being distributed for agency and public comment. Comment letters and responses to this Revised Draft EA are appended to the Final EA as Appendix C.

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8.0 APPENDICES

Appendix A – Pre-Assessment Consultation Correspondence
Appendix B – Original Draft EA Correspondence
Appendix C – Revised Draft EA Correspondence
Appendix D – Biological Report
Appendix E – Archaeological Assessment Survey
Appendix F – Archaeological Inspection of Kaūmana Cave
Appendix G – Cultural Impact Assessment Correspondence
Appendix H – Documentation of Request for Historic Preservation Review
Appendix I – Traffic Impact Assessment Report

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Appendix A
Pre-Assessment Consultation

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2009-TA-0130

Ms. Judy Mariant
Wil Chee – Planning and Environmental
1018 Palm Drive
Honolulu, Hawaii, 96814

MAR 0 6 2009

Subject: Early Consultation Request for a Proposed New Century Public Charter School, South Hilo, Hawaii

Dear Ms. Mariant:

This letter is in response to your request for early consultation on a proposed project to build a New Century Public Charter School in Kaumana, in the District of South Hilo on the island of Hawaii. We received your letter on February 4, 2009. The proposed project will consist of leasing 72 acres of land and building three schools: an elementary, intermediate and a High School.

Based on information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and the endangered Hawaiian hawk (*Buteo solitarius*) may occur in the project vicinity. There is no federally designated critical habitat near the project site.

In preparing your draft Environmental Assessment, we recommend you address potential project impacts to the Hawaiian hoary bat and the Hawaiian hawk and we offer the following measures to assist you in avoiding and minimizing potential impacts to these species:

- Hawaiian hoary bats roost and give birth in both exotic and native woody vegetation. However, use of the project area by Hawaiian hoary bats is currently unknown. To avoid potential impacts to this species, no woody plants suitable for bat roosting should be removed or trimmed during the bat birthing and pup rearing season (July through September). If you must clear the property during the Hawaiian hoary bat pupping season, we recommend conducting biological surveys to determine if bats are present. Please contact our office regarding survey methodology.
- Hawaiian hawks nest in both exotic and native woody vegetation. To avoid impacts to Hawaiian hawks we recommend avoiding tree clearing during the breeding season from March through September. If you must clear the property during the Hawaiian hawk

breeding season, we recommend conducting biological surveys to determine if hawk nests are present.

Thank you for the opportunity to assist you with your proposed project. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Technical Assistance Program (phone: 808-792-9431; email: jeff_zimpfer@fws.gov).

Sincerely,

Christa Russell

for Patrick Leonard
Field Supervisor

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

February 26, 2009

Wil Chee – Planning & Environmental
1018 Palm Drive
Honolulu, Hawaii 96814

Attention: Ms. Judy Mariant

Ladies and Gentlemen:

Subject: Early consultation on Draft Environmental Assessment for Connections New Century Public Charter School

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, Division of Forestry & Wildlife, Division of State Parks, Engineering Division, Commission on Water Resource Management, 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,

Charlene E. Unoki
for Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

RECEIVED
09 FEB 5 A11 : 44
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 4, 2009

MEMORANDUM

RECEIVED
2009 FEB 19 P 3:22
LAND DIVISION
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
__Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta Charlene
SUBJECT: Early consultation for draft environmental assessment for Connections New Century Public Charter School
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee – Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 25, 2009.

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.
(x) Comments are attached.

Signed: Ken C. Kawahara
Date: FEB 19 2009

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

February 19, 2009

REF: Connections New Century School.Pre-DEA

TO: Morris Atta, Administrator
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Early Consultation for Draft Environmental Assessment for Connections New Century Public Charter School, Hilo, Hawaii

FILE NO.: NA
TMK NO.: (3) 2-5-6:141

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwrm.

Our comments related to water resources are checked off below.

☒ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☒ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/pp/index.htm.

☒ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

☒ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/resources_permits.htm.

☐ 8. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water.

☐ 9. A Well Construction Permit(s) is (are) required any well construction work begins.

☐ 10. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 11. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 12. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 13. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.

☐ 14. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.

☐ 15. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 16. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER:
The project information document indicates that water will be provided through the Department of Water Supply municipal system. We recommend that the Draft Environmental Assessment (DEA) quantify the potable and non-potable needs for the project, and whether there are any available alternative sources of non-potable water. Waipahoehoe Stream is in the vicinity of the project, and any potential impacts to this stream should be disclosed.

If there are any questions, please contact Lenore Ohye at 587-0216.

52886

LINDA LINGLE
GOVERNOR OF HAWAII

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

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DEPT OF LAND & NATURAL RESOURCES

February 4, 2009

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2009 FEB 17 P 3:43
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STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
_x Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early consultation for draft environmental assessment for Connections New Century Public Charter School
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee – Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 25, 2009.

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: 2/12/09

LINDA LINGLE
GOVERNOR OF HAWAII

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

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STATE OF HAWAII

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 4, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early consultation for draft environmental assessment for Connections New Century Public Charter School
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee – Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 25, 2009.

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: 2/10/09

LINDA LINGLE
GOVERNOR OF HAWAII

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

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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HONOLULU, HAWAII 96809

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February 4, 2009

MEMORANDUM

TO: **DLNR Agencies:**
_x_Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
_x_Engineering Division
_x_Div. of Forestry & Wildlife
_x_Div. of State Parks
_x_Commission on Water Resource Management
__Office of Conservation & Coastal Lands
_x_Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early consultation for draft environmental assessment for Connections New Century Public Charter School
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee – Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 25, 2009.

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.
(X) Comments are attached.

Signed: Eric T. Hirano
Date: 2/10/09

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LM/MorrisAtta
REF.:EarlyConsultDEANewCenturyCharterSchool
Hawaii.422

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

(X) **The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.**

( ) Additional Comments:_____

( ) Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: Eric T. Hirano
ERIC T. HIRANO, CHIEF ENGINEER

Date: 2/10/09

LINDA LINGLE
GOVERNOR OF HAWAII

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

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DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 4, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early consultation for draft environmental assessment for Connections New Century Public Charter School
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee – Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 25, 2009.

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

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

Signed: Paul J. Conry
Date:
PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

FEB 11 2009

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

February 13, 2009

Ms. Judy Mariant
Wil Chee - Planning & Environmental
1018 Palm Drive
Honolulu, Hawai`i 96814

Dear Ms. Mariant:

Subject: Early Consultation on Connections Charter School Campus

The Department of Education has no early comment or concern with the proposed new campus for the Connections Charter School. We do note that all of the maps do not indicate the campus site in relation to downtown Hilo as a common point of reference. We will review the Environmental Assessment with interest.

If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 377-8301.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

c: Randolph Moore, Assistant Superintendent, OSFSS

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

February 17, 2009

Judy Mariant
Will Chee Planning & Environmental
1018 Palm Drive
Honolulu, Hawaii 96814

LOG NO: 2009.0099
DOC NO: 0902MD23
Archaeology

Dear Ms. Mariant:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Request for Comment on Various Permits Associated with the New Construction/Establishment of the Connections New Century Public Charter School Kaumana & Kukuau 2nd Ahupua`a, South Hilo District, Island of Hawaii
TMK: (3) 2-5-006:141

Thank you for the opportunity to comment on the aforementioned project, which we received on February 3, 2009. The entire property is within the 1880-1881 lave flow. A branch of the Kaumana lava tube complex runs underneath a portion of this site; care should be taken when planning construction in this area as there are known burials within other portions of this system and there is the potential of historic properties being located within the lava tube under this property.

We determine that **no historic properties will be affected** by this project because:

- ☒ Intensive cultivation has altered the land
- ☐ Residential development/urbanization has altered the land
- ☐ Previous grubbing/grading has altered the land
- ☐ An accepted archaeological inventory survey (AIS) found no historic properties
- ☐ SHPD previously reviewed this project and mitigation has been completed
- ☒ Other: *This parcel is entirely within the 1880-1881 lava flow.*

In the event that historic resources, including human skeletal remains, cultural materials, lava tubes, and lava blisters/bubbles are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, Hawaii Island Section, needs to be contacted immediately at (808) 933-7653. If you have questions about this letter please contact Morgan Davis at (808) 933-7650.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager
State Historic Preservation Division

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

IN REPLY REFER TO:

STP 8.3148

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

March 2, 2009

Mr. Wil Chee
Planning and Environmental
1018 Palm Drive
Honolulu, Hawaii 96814

Attention: Judy Mariant

Dear Mr. Chee:

Subject: Connections New Century Public Charter School
Early Consultation (EC)

Thank you for providing the subject project for the State Department of Transportation's (DOT) review and comments.

DOT understands that the proposed project involves the consolidation and construction of three schools at the same location and that access to the site is from Kaumana Drive.

DOT Highways Division recommends that a Traffic Impact Assessment Report (TIAR) be done for the subject project to determine the impacts of the 381-student school. The TIAR should also recommend appropriate measures to mitigate project generated impacts.

If there are any questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at (808) 587-2356.

Very truly yours,

Francis Paul Keeno

for BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

William P. Kenoi
Mayor

Lono A. Tyson
Director

Ivan M. Torigoe
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

February 18, 2009

Ms. Judy Mariant
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814

RE: Connections New Century Public Charter School
Mamalahoa Highway
South Hilo, Hawai`i

Dear Ms. Mariant,

We offer the following comments:

Solid Waste Division

If components of a Solid Waste Management Plan are included in the Environmental Assessment, it will not be necessary to submit one at a later date.

Wastewater

There are no county sewers in area of this project.

Please add our department to your list of agencies to be consulted during the preparation of the Draft Environmental Assessment. Thank you for allowing us to review and comment on this project.

Sincerely,

Lono A. Tyson
DIRECTOR

enclosure: Solid Waste Management Plan Guidelines

cc: SWD
WWD

11510A

William P. Kenoi
Mayor

Lono A. Tyson
Director

Ivan Torigoe
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

February 12, 2009

SOLID WASTE MANAGEMENT PLAN
Guidelines

INTENT AND PURPOSE

This is to establish guidelines for reviewing solid waste management plans, for which special conditions are placed on developments. The solid waste management plan will be used to: (1) promotes and implement recycling and recycling programs, (2) predict the waste generated by the proposed development to anticipate the loading on County solid waste management facilities, and (3) predict the additional vehicular traffic being generated because of waste and recycling transfers. A qualified consultant shall prepare a suitable solid waste management plan for review by the Department of Environmental Management.

REPORT

The Solid Waste Management Plan will contain the following:

1. Description of the project and the potential waste it may be generating: i.e. analysis of anticipated waste volume and composition. This includes waste generated during the construction and operational or maintenance phases. Waste types shall include (but not be limited to):
   A. Organics (including food waste and green wastes);
   B. Construction and Demolition;
   C. Paper (including cardboard);
   D. Metal (including ferrous and non-ferrous metals);
   E. Plastic;
   F. Special (including ash, sludge, treated medical, bulky items, tires);
   G. Household Hazardous (including paint, vehicle fluids, oil, batteries); and
   H. Glass.

2. Indicate onsite source separation facilities by waste type; i.e. source separation bins of glass, metal, plastic, cardboard, aluminum, etc. Provide ample and equal space for rubbish and recycling.

3. Identification and location of the proposed waste reduction, waste re-use, recycling facility or disposal site and associated transportation methods for the various components of the development's waste management system, including the number of

vehicle movements and associated routes that will be used to transport the waste and recycled materials.

4. The report will include identification of any impacts to County-operated waste management facilities, and the appropriate mitigation measures that will be implemented by the development to minimize these impacts.

5. Analysis will be based on the highest potential use or zoning of the development.

REQUIREMENTS AND CONDITIONS

1. A solid waste management plan will be prepared for all commercial developments, as defined under the policies of the Department of Environmental Management, Solid Waste Division.

2. The Department of Environmental Management will require the developer to provide or resolve all recommendations and mitigation measures as outlined in the solid waste management plan; besides any conditions placed on the applicant herein.

3. A State of Hawaii licensed engineer will draft and certify in writing the solid waste management plan as complying with applicable Federal, State and County of Hawai'i solid waste laws, regulations, and administrative rules.

Should you require additional information, please contact Michael Dworsky, P.E., Solid Waste Division Chief at 808-961-8515.

CONCUR:

Lono A. Tyson

Lono A. Tyson
DIRECTOR

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

March 18, 2009

Ms. Judy Mariant
Wil Chee – Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814

PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION
CONNECTIONS NEW CENTURY PUBLIC CHARTER SCHOOL
TAX MAP KEY 2-5-006:141

This is in response to your Februray 2, 2009 Pre-Environmental Consultation letter.

Water is available from an existing 8-inch waterline within Kaumana Drive and from an existing 8-inch waterline within Edita Street, both fronting the subject parcel.

Please be informed that the current water availability conditions in the area, which are subject to change, are limited to a maximum of seven (7) units of water per pre-existing lot of record. Each unit of water is equal to a maximum usage of 600 gallons per day (GPD); therefore, a maximum of 4,200 GPD is available for the proposed project.

The Department will request maximum daily water usage calculations, prepared by a professional engineer licensed in the State of Hawai'i, showing the estimated water demand for the proposed project. If the estimated maximum daily water usage for the proposed elementary, intermediate, and high schools exceeds 4,200 GPD, the Department's existing water system cannot support the project and extensive improvements would be required. The improvements may include, but not be limited to, additional source and storage facilities.

Further, any meter(s) serving the subject parcel shall have a reduced pressure type backflow prevention assembly installed within five (5) feet of the meter on private property before water service can be activated.

The existing 8-inch waterline within Edita Street is looped and therefore adequate to provide the required 2,000 gallons per minute fire flow, as per the Department's Water System Standards for schools.

Should there be any questions, you may 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

... Water brings progress...

William P. Kenoi
Mayor

Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

County of Hawai'i
FIRE DEPARTMENT
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

February 15, 2009

Ms. Judy Mariant
Will Chee-Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814

Dear Ms. Mariant,

SUBJECT: CONNECTIONS NEW CENTURY PUBLIC CHARTER SCHOOL
SOUTH HILO, HAWAII

In regards to the above-mentioned environmental assessment, the following shall be in accordance:

Fire apparatus access roads shall be in accordance with UFC Section 10.207:

"**Fire Apparatus Access Roads**

"**Sec. 10.207.** (a) **General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.

"(b) **Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.

"**EXCEPTIONS:** 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

"(c) **Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.

"(d) **Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

"**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.

"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.

"(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)

"(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)

"(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

"(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus.

"(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%)

"(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times.

"(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."

Water supply shall be in accordance with UFC Section 10.301(c):

"(c) **Water Supply.** An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county water requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow.

"Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

"The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207.

DARRYL OLIVEIRA
Fire Chief

JP:lk

William P. Kenoi
Mayor

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawaii
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2389

February 9, 2009

Ms. Judy Mariant
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, Hawaii 96814

Dear Ms. Mariant:

Subject: Connections New Century Public Charter School, South Hilo, HI

Staff, upon reviewing the limited information provided relative to this project, has recommended to me that the Hawaii Police Department declines comment regarding this project's potential impacts to traffic and/or other public safety concerns at this time.

Please provide us additional information at your earliest convenience so that we may meet your request for comment.

If you have any questions, please contact Captain Kenneth Vieira, Commander of the South Hilo Patrol Division, at (808) 961-2214.

Sincerely,

DEREK D. PACHECO
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

Appendix B
Original Draft EA Comment Letters and Responses

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

September 3, 2009

Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, Hawaii 96814

Attention: Ms. Celia Shen, Senior Planner

Ladies and Gentlemen:

Subject: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan

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 Division of Aquatic Resources, Division of Boating & Ocean Recreation, Land Division-Hawaii District, Engineering Division, Division of Forestry & Wildlife, Division of State Parks, 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,

Morris M. Atta
Administrator

Cc: OEQC

LINDA LINGLE
GOVERNOR OF HAWAII

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

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 3, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District
x Historic Preservation

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 3, 2009.

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

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

Signed: Paul J. Conry
Date: AUG 26 2009

PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Paul Conry, Administrator
Dept. of Land and Natural Resources, Division of Forestry & Wildlife
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Conry,

We have received your memorandum dated August 26, 2009 informing us that you have no objections to the project. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

53354

LINDA LINGLE
GOVERNOR OF HAWAII

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

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 3, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x ~~Engineering Division~~
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District
x Historic Preservation

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
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FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

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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: 8/7/09

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Dept. of Land and Natural Resources, Division of State Parks
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Sir/Madam,

We have received your memorandum dated August 7, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

LINDA LINGLE
GOVERNOR OF HAWAII

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

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DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 3, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x ~~Office of Conservation & Coastal~~ Lands
x Land Division –Hawaii District
x Historic Preservation

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

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Attachments

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

Signed:
Date: 8.13.09

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Dept. of Land and Natural Resources, Land Division Hawai'i District
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Sir/Madam,

We have received your memorandum dated August 13, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

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Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
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HONOLULU, HAWAII 96809

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2009 AUG -7 P 3:04
DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

August 3, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division – Hawaii District
x Historic Preservation

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

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Attachments

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

Signed:
Date: 8/4/09

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WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Dept. of Land and Natural Resources, Division of Boating & Ocean Recreation
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Sir/Madam,

We have received your memorandum dated August 8, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

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Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

LINDA LINGLE
GOVERNOR OF HAWAII

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

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HONOLULU, HAWAII 96809

August 3, 2009

MEMORANDUM

RECEIVED AUG 5 2009 AQUATIC RESOURCES

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District
x Historic Preservation

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

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Attachments

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

Signed:
Date: 11 Aug 2009

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DIV OF AQUATIC RESOURCES
HILO, HAWAII

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Dept. of Land and Natural Resources, Division of Aquatic Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Sir/Madam,

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Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

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

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HONOLULU, HAWAII 96809

August 3, 2009

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LAND DIVISION
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DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
09AUG05AM10:42 ENGINEERING

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District
x Historic Preservation

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan
LOCATION: Hilo, Hawaii, TMK: (3) 2-5-6:141
APPLICANT: Wil Chee-Planning & Environmental on behalf of Connections New Century Public Charter School

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 3, 2009.

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.
(X) Comments are attached.

Signed:
Date: 8/30/09

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorisAtta
Ref.: DEANewCenturyPublicCharterSchoolMasterPlan
Hawaii.443

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

(X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

_____

(X) Other: Our previous comments dated February 10, 2009, which is included in the Draft Environmental Assessment document, still apply.

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 8/30/09

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Eric T. Hirano, Chief Engineer
Dept. of Land and Natural Resources, Engineering Division
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Hirano,

Thank you for your comments dated August 3, 2009 concerning the subject Draft EA. We acknowledge that your February 10, 2009 Pre-Consultation comments, in which you confirm the project site's location in Zone X according to the Flood Insurance Rate Map, are still applicable. Water demands and calculations will be provided to the Engineering Division to be included in the State Water Projects Plan Update when they become available.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

September 24, 2009

Log No. 2009.3291
Doc No. 0909TD24

MEMORANDUM

TO: Morris M. Atta, Land Division
P.O. Box 621
Honolulu, Hawai`i 96809

FROM: Pua Aiu, Administrator

SUBJECT: **Chapter 6E-7 and 6E-8 Historic Preservation Review –**
Draft Environmental Assessment, Connections New Century Public Charter School
Ponahawai Ahupua`a, South Hilo District, Island of Hawai`i
TMK: (3) 2-2-06: 141

Thank you for requesting our comments regarding the subject DEA, which was received in our office August 17, 2009. The proposed project involves the construction of a new public charter school campus encompassing approximately 72 acres on state-owned land. The campus is divided into two sections (upper and lower) by the existing Edita Street.

Our office has previously commented on this project in a February 17, 2009 letter to Judy Mariant of Will Chee Planning (Log 2009.0099, Doc 0902MD23). In this correspondence, we indicated that there were no known historic properties within the project area, but that a branch of the Kaūmana lava tube complex runs beneath a portion of the project area and that, "…there is the potential of historic properties being located within the lava tube under this property." We recommended that care be taken when planning construction in the area overlying the lava tube. The plans presented in the EA indicate that several building may be directly over or very close to the cave. Information provided in Dr. Stone's testimony dated September 4, 2009, suggests that usage of the cave may have begun shortly after its formation *circa* 1881. If use occurred during the early twentieth century, we believe it is important to document the nature of that use, and to ensure that if significant historic sites are present, that they be afforded appropriate mitigation measures and/or preservation prior to the onset of construction activities that could cause collapses.

Attached to the DEA is a report entitled *Archaeological Assessment Survey of the Connections Charter School Kaūmana Property, South Hilo District, Island of Hawaii,* Reeve and Cleghorn 2008). The fieldwork described in this report found no evidence of historic properties within the project area; however, the study did not include an examination of the portion of the Kaūmana Cave that runs beneath the upper campus area. We did not have an opportunity to review this assessment report prior to its publication in the DEA.

We cannot make an accurate determination of project effects until after the archaeologists return to the project area and conduct a more thorough investigation of the Kaūmana Cave beneath the project area. We are sending a letter to the consulting firm requesting additional fieldwork and revisions to the assessment report. We also recommend that the EA be revised to include accurate information regarding the presence/absence of historic properties within the cave. Please contact Theresa Donham at (808) 933-7653 if you have any questions or comments.

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Pua Aiu, Administrator
Dept. of Land and Natural Resources, State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Ms. Aiu,

Thank you for your comments dated September 24, 2009 concerning the subject Draft EA. Due to the nature of other comments we received, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Development of major school facilities are now being proposed within the lower portion of the parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this segment was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety and other concerns, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave.

We have reviewed your request to conduct additional fieldwork, specifically to investigate the presence or absence of historic properties within Kaūmana Cave. CPCS and WCP currently are working with our consulting archaeologist to have this investigation completed.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion. Thank you for participating in the environmental review process with us.

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

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

HRD09/4592

September 2, 2009

Celia Shen
Wil Chee Planning and Environmental
1018 Palm Drive
Honolulu, Hi 96814

RE: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan, Hilo, Hawai'i Island, TMK: (3) 2-5-006:141.

Aloha e Celia Shen,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter requesting comments on the above-mentioned project. Connections New Century Public Charter School Master Plan proposes to construct a new campus on 72 acres of vacant, state-owned land in South Hilo, Hawai'i Island. About 12.5 acres of the site would be built-up to include roads, parking, fields, gardens, an administrative center, cafeteria, classrooms and dormitory. The school is expected to serve fewer than 300 students. OHA has reviewed the project and offers the following comments.

The applicant states that a previous Cultural Impact Assessment for a separate project concluded that there was no evidence that traditional cultural practices are conducted at the project site. However, this CIA was not included in the DEA's appendix. OHA requests the opportunity to review the CIA, which apparently was completed for the Puainako Street Extension and Widening project. We ask whether recent interviews of cultural practitioners have been conducted or is the applicant planning to completely rely on a CIA that appears to be more than 10 years old. We note that the pictures in the archaeological assessment appear to show trails going through the forest on the project site. These trails may be used by cultural practitioners.

OHA appreciates that an archaeological monitor will be called on site to inspect any previously undiscovered lava tubes encountered during construction activities. We recommend that if a lava tube is discovered, construction activities around the lava tube should be stopped until an archaeological monitor can inspect the tube. We agree with the archaeological assessment that such lava tubes have the potential to contain cultural deposits or Native

Hawaiian remains. If construction activities are allowed to continue around the lava tube before an archaeological monitor arrives to inspect it, the tube may collapse endangering whatever may be inside. 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 project, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

The applicant indicates that it will preserve much of the native forest found on the project site by incorporating the forest into the school design. We applaud this design concept and request further information regarding exactly how much of the forest will be impacted by the project. We recommend that the applicant consider replanting native plants removed from the site to other areas. While the native forests found on the project site are not endangered, they are still valuable, precious and becoming increasingly rare with the urbanization of our islands. OHA further suggests that any native plants that cannot be replanted be offered to cultural practitioners for use. In addition, we appreciate that the applicant plans to conduct reforestation efforts at the project site by planting koa and hāpu'u.

Further, OHA notes that the subject land is designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public. OHA requests that the Ceded Lands status of the project site be clearly indicated in the Final EA. Identifying and documenting Ceded Lands in such a manner will help with the creation of a comprehensive Ceded Lands inventory.

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

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Hilo CRC Office

Katherine Kealoha, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hi 96813

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Clyde W. Nāmu'o, Administrator
Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawai'i 96813

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Nāmu'o,

Thank you for your comments dated September 2, 2009 concerning the subject Draft EA. Due to the nature of other comments we received, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Development of major school facilities are now being proposed within the lower portion of the parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this segment was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety and other concerns, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

In response to your comments we offer the following:

Comment #1: *Concern about a more recent Cultural Impact Study (CIA) not being included for the site for this proposed project. We ask whether recent interviews of cultural practitioners have been conducted or is the applicant planning to completely rely on a CIA that appears to be more than 10 years old. The previous CIA is over 10 years old. Photographs of the site show trails on the project site, which may have been used by cultural practitioners.*

CPCS and WCP will attempt to update the findings of the CIA conducted for the Puainako Street Extension, the study area of which encompassed the subject property. Organizations and individuals are being contacted that may be able to assist in ascertaining if the project would impact any traditional cultural properties or practices. The trails which are shown in photographs were cut by CPCS personnel to facilitate conducting the archaeological and biological surveys of the property. They were not cut by cultural practitioners and did not exist prior to being cut by CPCS personnel.

Comment #2: *Appreciation expressed that an archaeological monitor will be called on site to inspect any previously undiscovered lava tubes that may be uncovered during construction.*

We acknowledge your comments regarding precautionary measures when conducting construction activities in the vicinity of caves and lava tubes. CPCS remains committed to developing this project in a responsible manner and the precautionary measures contained in the Draft EA will be carried over to the Revised Draft EA.

Comment #3: *Appreciation expressed at the efforts to preserve as much of the native forest as possible on the site, and to replant native plants on the project site. Request that information be provided regarding how much of the native forest would be impacted by the project and that any native plants to be removed be offered to cultural practitioners.*

Due to the reconfigured campus plan, it is expected that there would be little to no adverse impact on the native ʻōhiʻa forest on the property's upper parcel as development of the school's major facilities would be limited to lower parcel, below Edita Street. The lower parcel is characterized primarily by a variety of weeds and nonnative plant species. Potential impacts the reconfigured campus site plan may have on the native forest and native plants will be addressed in the forthcoming Revised Draft EA, including an estimate as to how much native forest would be impacted, if warranted. We acknowledge your comments that any native plant species removed during development should be replanted elsewhere or offered to cultural practitioners. Thank you for bringing this idea to our attention.

Comment #4: *OHA notes that the subject land is designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical, and legal significance for Native Hawaiians and OHA. Request that the Ceded Land status of the project site be clearly indicated in the Final EA, to assist in the creation of a comprehensive Ceded Land inventory.*

We acknowledge that the subject property is designated as Section 5(b) Ceded Lands. The Revised Draft EA will clearly indicate this property's Ceded Land status.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

LINDA LINGLE
GOVERNOR
STATE OF HAWAI'I

MICAH A. KĀNE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

KAULANA H. PARK
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAI'I 96805

August 19, 2009

Will Chee - Planning & Evironnmental
Attn: Celia Shen, Senior Planning
1018 Palm Drive
Honolulu, Hawaii 96814

Ms. Shen:

Subject: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan

Thank you for the opportunity to review the subject proposal.

The Department of Hawaiian Home Lands has no comment to offer at this time. If you have any questions, please contact our Planning Office at (808) 620-9480.

Aloha and mahalo,

for Kaulana Park, Chairman(Designated)
Hawaiian Homes Commission

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Kaulana Park, Chairperson (Designated)
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Park,

We have received your letter dated August 19, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

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Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

William P. Kenoi
Mayor

Lono A. Tyson
Director

Ivan M. Torigoe
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

August 24, 2009

Department of Land and Natural Resources
Land Division
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

Attention: Morris Atta

Subject: Draft Environmental Assessment for Connections New Century Public Charter School Master Plan

Dear Mr. Atta,

Our department has no comments to offer on the subject project.

Thank you for allowing us to review and comment on the DEA.

With Regards and Aloha,

Lono A. Tyson
DIRECTOR

cc: Katherine Kealoha, OEQC
Celia Shen, Wil Chee Planning & Environmental

11988R

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Lono A. Tyson, Director
County of Hawai'i
Department of Environmental Management
25 Aupuni Street
Hilo, HI 96720

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Tyson,

We have received your letter dated August 24, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee - Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

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Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

William P. Kenoi
Mayor

Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

County of Hawai'i
HAWAII FIRE DEPARTMENT
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

August 11, 2009

Attention: Celia Shen
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, Hawai'i 96814

Dear Ms. Shen,

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
CONNECTIONS NEW CENTURY PUBLIC CHARTER SCHOOL MASTER PLAN

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced draft Environmental Assessment.

Thank you for the opportunity to comment.

Sincerely,

DARRYL OLIVEIRA
Fire Chief

GA:lk

Hawai'i County is an Equal Opportunity Provider and Employer.

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Chief Darryl Oliveira
County of Hawai'i
Hawaii Fire Department
25 Aupuni Street, Suite 103
Hilo, HI 96720

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Chief Oliveira,

We have received your letter dated August 11, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

William P. Kenoi
Mayor

COPY

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8865

August 11, 2009

Mr. Morris Atta, Land Agent
Department of Land & Natural Resources
Land Division
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

Dear Mr. Atta:

Subject: Draft Environmental Assessment for Connections New Century Public School Master Plan

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

Thank you for allowing us the opportunity to comment.

If you have any questions or concerns, please contact Captain Kenneth Vieira of our S. Hilo Patrol Division at 961-2214.

Sincerely,

DEREK D. PACHECO
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

KV:lli

xc: Office of Environmental Quality Control, Attn. Katherine Kealoha
Wil Chee Planning & Environmental, Attn. Celia Shen

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Derek D. Pacheco
Assistant Police Chief, Area I Operations
County of Hawai'i
Police Department
349 Kapiolani Street
Hilo, HI 96720

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Asst. Chief Pacheco,

We have received your letter dated August 11, 2009 informing us that you have no comments at this time concerning the subject Draft EA. Thank you for participating in the environmental review process with us.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

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

August 18, 2009

Mr. Morris Atta
State of Hawai'i
Department of Land and Natural Resources, Land Division
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

DRAFT ENVIRONMENTAL ASSESSMENT
CONNECTIONS NEW CENTURY PUBLIC CHARTER SCHOOL
TAX MAP KEY 2-5-006:141

We have reviewed the subject Draft Environmental Assessment (DEA) and have no further comments at this time. We have no objection to the proposed project, subject to the applicant understanding that we can only provide a maximum of 4,200 gallons per day.

Our comments from our March 18, 2009 Pre-Environmental Assessment Consultation letter, which was included in the DEA, still stand.

Should there be any questions, you may 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
Ms. Celia Shen, Wil Chee Planning and Environmental

... Water brings progress...

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Milton D. Pavao, P.E., Manager
County of Hawai'i
Department of Water Supply
345 Kekūanaō'a Street, Suite 20
Hilo, HI 96720

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Mr. Pavao,

We have received your letter dated August 18, 2009 informing us that you have no comments at this time concerning the subject Draft EA. We acknowledge that the comments in your March 18, 2009 Pre-Consultation letter are still applicable and that your department can provide no more than 4,200 gallons per day of water for the project.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

William P. Kenoi
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BJ Leithead Todd
Director

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County of Hawai'i
PLANNING DEPARTMENT
Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawai'i 96720
Phone (808) 961-8288 • Fax (808) 961-8742

August 12, 2009

Mr. Morris Atta
Land Division
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

Dear Mr. Atta:

Subject: **Comments on Draft Environmental Assessment**
Project: **Connections New Century Public Charter School Master Plan**
TMK: **(3) 2-5-006:141; Ponahawai and Kūkūau 2nd, South Hilo, Hawaii**

This letter is prepared in response to correspondence dated July 27, 2009, providing this office with a copy of a Draft Environmental Assessment (DEA) prepared pursuant to Hawai'i Revised Statutes, Chapter 343 and Administrative Rules, Title 11, Chapter 200.

The Connections New Century Public Charter School is proposing to open a new campus to include the pre-k, elementary, intermediate, and high school campuses on one parcel. Connections is pursuing a land lease with the current property owner, the State of Hawai'i.

The subject property is zoned AG-1a (Agricultural-minimum 1 acre lot size) and is situated within the State Land Use Agricultural District. In addition, according to the County of Hawai'i General Plan 2005 (amended December 2006); the subject property is designated as Low Density Urban by the Land Use Pattern Allocation Guide. The parcel is not located in the Special Management Area.

The DEA for Connections New Century Public Charter School Master Plan has been reviewed by this office and we offer the following comments:

The DEA incorrectly states that the County of Hawai'i General Plan LUPAG designation for the subject parcel is Urban Expansion. Please note that the correct designation is Low

Density Urban, which allows for residential, with ancillary community and public uses, and neighborhood and convenience-type commercial uses; overall residential density may be up to six units per acre.

We have no further comments to offer, at this time. If you have any questions or if you need any assistance, please feel free to contact Bethany Morrison of this office at 961-8138.

Sincerely,

BJ LEITHEAD TODD
Planning Director

BJM:cs
P:\wpwin60\Bethany\General Zoning Inquiries\consultdrafteaConnections.doc

cc: Ms. Katherine P. Kealoha, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813-2419

Ms. Celia Shen
Wil Chee Plannign & Environmental
1018 Palm Drive
Honolulu, HI 96814

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

B.J. Leithead Todd, Director
County of Hawai'i Planning Department
Aupuni Center
101 Pauahi Street, Suite 3
Hilo, HI 96720

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Ms. Leithead Todd,

We have received your comments dated August 12, 2009 concerning the subject Draft EA. Thank you for providing us with updated information regarding the subject property. We have noted the change in the EA that the subject property is designated as Low Density Urban, not Urban Expansion.

Due to the nature of other comments we received on the Draft EA, Connections Public Charter School (CPCS) and Wil Chee – Planning & Environmental (WCP) have decided to reconfigure the site plan for this project. Concern was expressed from speleologists, members of the scientific community, and other interested persons that the Draft EA did not adequately address potential environmental impacts on Kaūmana Cave resulting from the proposed project. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent.

Therefore, CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted. We will provide your agency with a copy of the Revised Draft EA upon its completion.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Sept. 4, 2009

To: Wil Chee – Planning and Environmental
Attn: Celia Shen or Richard Stook
1018 Palm Drive
Honolulu, Hawaii 96814

From: Fred D. Stone, Ph.D.
P.O. Box 1430
Kurtistown, HI 96760
Tel: 808-966-7361

Dear Mr. Chee,

I am enclosing my comments on the Draft EA for Connections Charter School in Kaumana. The intent of creating a "green" and environmentally sound plan for the new school is commendable. However, I was astonished to find that the major and important cave that underlies the upper property, Kaumana Cave, was left out of the draft EA. It is certainly impossible to carry out the plan without seriously impacting the cave, which does not fit the stated intention. There is no way to have a "green" and environmentally sound plan while ignoring a major and integral feature of the property.

The current plan has a strong potential of causing significant and irreversible environmental impacts on the cave and its specially adapted ecosystem. To recommend a Finding of No Significant Impact while ignoring a major part of the environment is simply untenable. I believe it is necessary to recommend an Environmental Impact Statement be carried out.

Please feel free to contact me if you have questions about my comments. I look forward to seeing your Final EA.

Sincerely,

Fred D. Stone

Cc.
John Thatcher, Coordinator
Connections Public Charter School
174 Kamehameha Ave
Hilo, Hawaii 96720

Laura Thielen
Office of the Chairperson
1151 Punchbowl St.
Room 110
Honolulu, HI 96813

Comments on the Draft E.A. for Connections Charter School in Kaumana

Fred D. Stone, Ph.D
P.O.Box 1430
Kurtistown HI 96760
Phone 808-966-7361

Sept. 2, 2009

SUMMARY

I am requesting that an Environmental Impact Statement be completed on the plan for Connections Charter School in Kaumana. The reasons are:

The Draft EA has not adequately assessed the potential significant impact of the proposed development on Kaumana Cave, which underlies a major part of the project area beneath the former TMK 2-5-06-4, the mauka lot currently combined with TMK 2-5-06-141 (see Figures 1,2,3 below). Hawaiian land law includes in property ownership not only the surface but the subsurface , including caves. It is therefore highly improper to leave out of the Draft EA a large and well known cave that underlies, and is part of the proposed parcel.

1. The survey showing the location of Kaumana Cave under the development was omitted from the Draft EA. This is a significant omission, given that the cave was surveyed by Island Survey as part of the Puainako Extension EIS (1993, p34). Although the Draft EA sites the Puainako Extension EIS, the map showing the cave location was inexpicably left out. An accurate map of the cave is crucial for designing surface structures to avoid safety issues during construction and to prevent damage or pollution to the cave. (see Figure 1 below)
2. The Draft EA does not include the relevant parts of the Hawaii State Cave Protection Law (SH2898), which should be included in the Final EA and EIS.
3. Hazards relating to construction over Kaumana Cave have not been addressed adequately: the depth of the cave and the thickness of lava overlying the cave have not been adequately measured, with related liability and safety issues for surface development and for roof collapse within the cave. Clearing and grading over the cave could also have significant impacts on the cave ecosystem and hydrology.
4. The issues regarding the placement of the school on an area with recent lava flows has not been adequately addressed: the entire development is on the 128 year old 1880-81 lava flow in the Mauna Kea/Mauna Loa Saddle zone, that regularly channels lava flows from Mauna Loa's upper northeast rift zone.
5. The hydrology of the area is inadequately analyzed. A thorough hydrological survey needs to be included in the Final EA and EIS, as was done for the Puainako Extension EIS (Appendix F, Drainage). The 1880-81 lava flow followed an intermittent stream channel from above Kaumana Village to below the planned development. The entire length of Kaumana Cave beneath the development is a flood water channel on a perched aquifer. Runoff water from Kaumana Drive is channeled into the cave, and contributes to major flooding of the cave downslope.
6. Alternative sites are not adequately addressed, except to state that there aren't any. Given the serious potential environmental impacts of the development, other sites should be presented and reasons for their acceptance or rejection should be detailed.
7. The cave biology was not included in the Draft EA (Appendix B), although it has been thoroughly studied and is well known (Puainako EIS, Appendix D).
8. Alternative uses of Kaumana Cave and the State land overlying it have not been adequately assessed.
    - Science: geology, vulcanology, biology, microbiology
    - Tourism, recreation
    - Education
    - Religious and spiritual use
    - Historical values

Detailed Comments

Kaumana Cave is an important feature with many values that deserve to be protected. These include its natural resources (geology, vulcanology, hydrology, biology, microbiology) and its uses for education, tourism, recreation, religion and science. Over 2300 feet of Kaumana Cave lies within TMK 2-5-06-4, directly beneath the proposed Connections Charter School. However, the Draft EA for the planned school development contains no detailed assessment of the potential hazards of building the school over the cave, or the possible significant impacts of school construction on the cave and its resources. For this reason, it is essential that an Environmental Impact Study be conducted that will include an assessment of potential significant environmental impacts Kaumana Cave and its relation to the planned development.

1. Lack of a survey of Kaumana Cave is a serious fault of the Draft EA. The location of the cave was clearly known to the planners who wrote the Draft EA as shown by their statement:

Draft EA p. 10: "Just west of the property, on the far side of Kaumana Drive, is the main entrance to the Kaumana lava tube complex, which has been designated as Kaumana Caves County Park."

Draft EA p. 29: "Portions of the project site are underlain by lava tubes that make up Kaumana Cave system. The entrance to Kaumana Caves is located at a small county park near the western-most tip of the property, across Kaumana Drive (Hazlett & Hyndman, 1996)."

Since the planners knew that Kaumana Cave existed within the project site, it is imperative that they include the cave location in the plan with an assessment of potential impacts. A map showing the cave location was included in the 1993 Puainako Street Extension EIS, copied here as Figure 1. Comparison of this with the planned Charter School shows that most of the school buildings, roads and septic systems were placed over or close to Kaumana Cave. Figure 2 shows the school plan from the Draft EA with red arrows showing the approximate location of the cave.

The necessity for the planner to include an accurate survey of the cave should be quite evident.

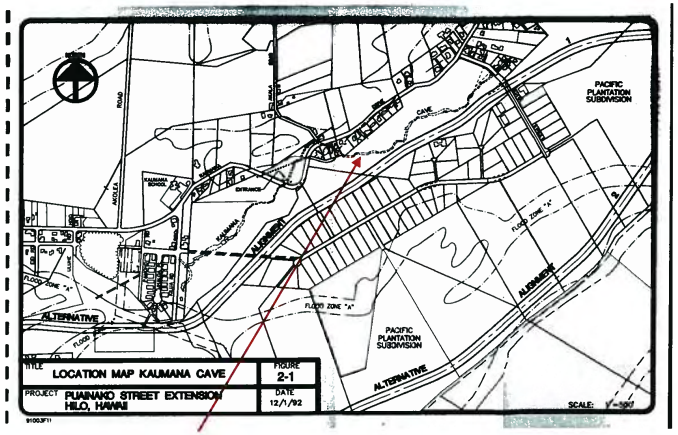

Figure 1: Location of Kaumana Cave within TMK 2-5-06-4, surveyed by Island Survey for the Puainako Extension & Widening EIS, 1993, p34 (omitted from the current draft EA)

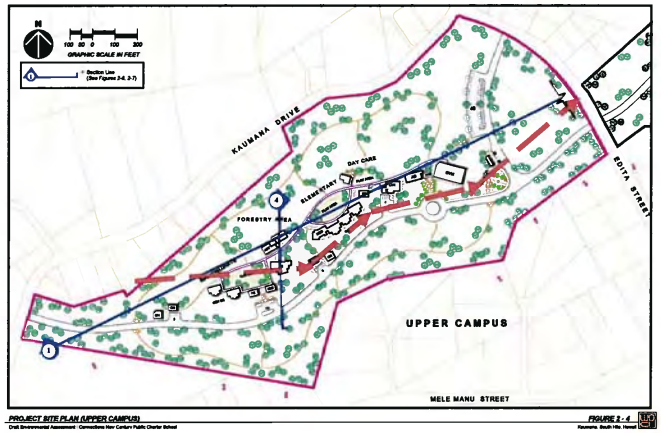

Figure 2: Planned site of Connections Charter School on TMK 2-5-06-4: Dashed red arrows added to show approximate location of Kaumana Cave

2. Hawaii Cave Protection Act, SB2898. In 2002 the State Legislature passed a Cave Protection Act to prevent damage to caves from vandalism and developments such as the planned Connections Charter School. It is critical that the planner include the Cave Protection Act in the Final EA and Environmental Impact Study, specifically including, in the design, a discussion of how potential significant impacts to the cave and its resources will be avoided or mitigated. Mitigation should include: no grading of the lava surface over the cave, no construction over the cave, prevention of sewage or other pollutants (such as pesticides) from entering the cave from septic drainage fields and code mandated pest control, avoiding cutting native trees or other vegetation over the cave to prevent loss of the major tree root food source for the cave ecosystem. The Cave Protection Act also requires that landowners give written consent to people entering caves under their land. The Draft EA does not include an analysis of how this would be accomplished, or whether the State as the Owner or the Lessee would be responsible for giving written permission to visitors to Kaumana Cave.

3. Hazards of construction over the lava tube roof. The draft EA states, p 29: "The lava tubes were formed in the core of the lava flow that covered the area in 1881-1882 with the roofs of the tubes being 20 to 25 feet thick in most places (McDonald et al, 1983)."
This statement is totally inadequate as a guideline for avoiding hazards to construction equipment working over the cave, and as a protection from damage to the cave from roof collapse and from removal of the native 'ohi'a trees over the cave. The 1880-81 Kaumana lava flow occurred over a period of a few months. There was not time either for the cave roof to be thickened and strengthened by surface flows, or for the lava flow to erode deeply into the subsurface. It is more likely that the surface over the cave is not much more than 5 to 10 feet thick. However, the only way to determine the roof thickness is to conduct a survey through the cave, measuring the floor and ceiling elevations, and then over the surface above the cave to measure the surface elevation. Without this critical information, it is dangerous and irresponsible to permit construction over the cave. The vertical measurements should be done by professional surveyors as part of an Environmental Impact Study.

   A possible mitigation measure is shown in Figure 3 showing approximate 100 foot safety borders that could be used to prevent significant environmental impacts to the cave and hazards to construction equipment. This design would exempt the area over and adjacent to the cave from any alteration, and place the school buildings, roads, septic systems, etc. on the outer portions of the lot.

   A more desirable alternative would be to remove the entire mauka parcel (the former TMK 2-5-06-4) from any development, and restrict the project to the makai parcel (the original TMK 2-5-06-141)

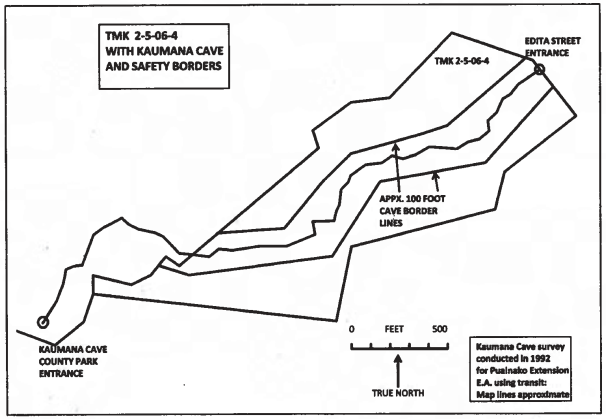

Figure 3: TMK 2-5-06-4 showing the approximate location of Kaumana Cave with 100 foot suggested mitigation boundaries to avoid significant environmental impact to the cave and hazard to construction equipment

4. The draft EA cites the USGS Lava Flow Hazard Map:

> "… much of South Hilo, including the entire project site, is contained in Lava Flow Hazard Zone 3 which are areas that have had 15-75% of their surface covered by lava in the last 750 years, and 1-5% of their surface covered by lava since 1800."

Although this is technically a correct citation from the Lava Flow Hazard Map, it ignores the actual lava flow geology of the planned site. Rather than "…1-5% of [its] surface covered by lava since 1800", the proposed site has 100% of its surface covered by lava since 1881, 128 years ago. It is located in the Mauna Kea/Mauna Loa Saddle, which is the path followed by numerous lava flows from Mauna Loa. Additional historic lava flows that followed this pathway (with distance from the flow end to the proposed development) include: 1852 (6 miles), 1855 (3 miles), 1942 (6 miles), 1984 (7 miles). (Wolfe & Morris, 1996. Geologic Map of the Island of Hawaii).

It would make more sense in terms of project design to use the actual flow lava activity in an assessment of lava hazards for the area, rather than the broad generalization given in the USGS Lava Hazard Map.

5. The draft EA quotes the FEMA flood potential map as follows (p32):

"The island is geologically very young and has not had a chance for the formation of defined watercourses in many areas. These poorly defined watercourses often flow and

overflow during rain storm events South Hilo district is particularly impacted by this problem due to high amounts of rainfall. The Federal Emergency Management Agency (FEMA) has classified the lands within the project site as Zone X, lands with no recognized flood potential that are located outside both the 100-year and 500-year floodplain (Figure 3-2)."

Based on this, the draft EA states that the project area is not in a flood zone. This ignores the actual situation, that Kaumana Lava Flow followed an intermittent stream bed from above Kaumana Village to below the proposed development. This makes Kaumana Cave an underground flood channel. Figure 4 below shows the FEMA flood map with the approximate course of Kaumana Cave shown as red dashed arrows. During extended or heavy rainfall, which occurs several times each year, water runs into Kaumana Cave from intermittent streams and from a runoff channel that diverts Kaumana Road drainage into the cave in Kaumana Village. Water partially floods the cave, and some of this flood water exits from the Edita Street entrance, and floods the area downslope, including the lower TMK (2-5-06-141). Placing buildings, roads, parking areas, and septic drainage systems over this flood channel has a major potential for significant environmental impact.

The reason for this flooding is that the 1880-81 lava flowed over older soil layers that had formed incipient stream channels, and an actual stream bed that the lava tube followed. The stream still exists beneath the lava tube, and rises to partially fill it during flood periods.

It is important that, rather than citing a FEMA flood map that ignores the underground drainage, a hydrological study be done as part of an EIS, to determine the actual flood hazards. Interviews with residents below the Edita Street exit of Kaumana Cave will show that the cave has flooded that area several times in the past few decades.

The 1993 Puainako Extension EIS, Appendix F, Drainage gives a detailed hydrological analysis of the area which should be used as the basis for the flood hazard assessment in the Final EA and EIS.

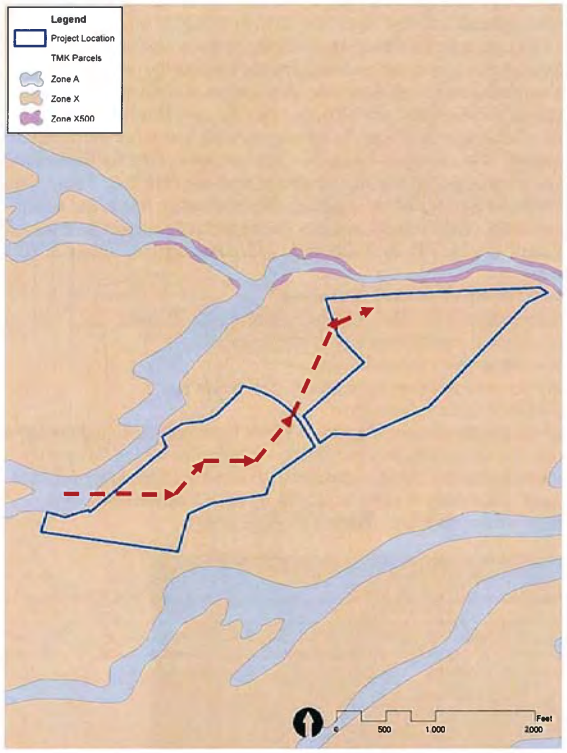

Figure 4: Flood zone map with dashed lines showing approximate location of Kaumana Cave (section below Edita Street based on survey by the Hilo Lions Club, in Hilo Tribune Herald, Mar. 21, 1954): The cave forms an underground flood conduit during heavy rains.

6. Alternite sites. It is not adequate to simply state that no other sites exist. Given the hazards to construction on the proposed site, other sites should be identified and assessed. A more thorough assessment of other potential sites needs to be included in the final EI and in an EIS.

7. Biology of Kaumana Cave. Kaumana Cave was not included in the invertebrate survey for the proposed development area(Draft EA, Appendix B) even though it was included in the Puainako Extension EIS(Appendix D) which was available to the consultants. This is a serious omission, since a major part of the cave lies directly beneath the project area, and therefore should not have been excluded. Since the cave species depend directly on roots of 'ohi'a trees (*Metrosideros polymorpha*), any activities over the cave that remove the 'ohi'a trees will remove one of the major food sources for cave species, which has the potential of causing significant impact. The survey of Kaumana Cave species in 1992 for the Puainako Extension EIS showed several species that were excluded from the draft EA. These species are endemic to lava tubes on Hawai'i Island, meaning they evolved on this Island and are found nowhere else on earth. The Final EA and EIS should include a current inventory of this important ecosystem. (Stone, F.D. et al Lava tube tree communities. Culver & White. Encyclopedia of Caves.)

Some of the species left out of the draft EA include:

Orthoptera: two cave adapted species: *Caconemobius varius, C. uuku*

Homoptera: cave adapted plant hoppers: *Oliarus polyphemus*

Hemiptera: cave water strider: *Speovelia aaa*

Lepidoptera: cave entrance and deep cave moths: *Schrankia* sp.

Millipede: cave adapted species: *Nannolene*

Microbiology: Bacterial and fungal mats occur on the walls of Kaumana Cave, and are termed "cave slime". A group of cave microbiologists is currently including Kaumana Cave in an ongoing study of cave microorganisms. Most of the species haven't yet been described, and have potential medical uses. This study is partly supported by NASA to determine how organisms might exist in lava tubes on Mars. (Garica, M. et al. 1990)

Figure 5: An endemic Hawaiian cave adapted cricket, *Caconemobius uuku*, occurring in Kaumana Cave; showing tree root habitat. (photo by Frank Howarth, Kazumura Cave, Hawaii)

8. Other uses for the project area. Kaumana Cave is an important natural resource with several important uses. These should be included in a thorough EIS assessment, which includes Kaumana Cave as an integral part of the lavaflow that overlies it. Currently, only the County Park around the cave entrance is protected. DLNR should give serious consideration to alternative land management that would protect the cave resources.

   Scientific values: A great value of Kaumana Cave is that it occurs in Hilo and has easy access for scientific research. This allows scientists to use the cave as a field laboratory. Over the past several years, I have participated in research on cave crickets, cave planthoppers and cave microbiology. Currently, Kaumana Cave crickets are being used in a Moore Foundation grant to UH Hilo on use of bar-coding to characterize Hawaiian species. Dozens of scientists who attended national and international meetings in Hilo have gone on field trips to Kaumana Cave. Meetings included the Evolution Society, the International Orthopterists Society, and the Wildlife Society.

   Education: Kaumana Cave is ideally situated to use for class field trips, youth groups, and club outings. Since I began teaching at UH Hilo and Hawai'i Community College in the mid 1980's, I have taken several classes to the cave each year with 15 to 20 students per class. Although I am now retired, I still conduct field trips for college classes. The total number of students I have taken to the cave over the past 25 years numbers well over 1000.

   Tourism and recreation: Thousands of tourists and local residents visit Kaumana Cave every year. Apart from Thurston Lava Tube in Hawaii Volcanoes National Park, Kaumana is the only cave that is easily accessible for visits that is still in its natural state. When I moved to Hawai'i in 1984, the cave was strewn with litter and the walls were covered with graffiti. I enlisted my students and youth groups to help in picking up trash and scrubbing graffiti from the cave walls. Other cavers and community residents worked to clean a large accumulation of trash from the entrance on Kilua Street in Kaumana Village. This trash had been washing throughout the cave during flooding. As a result of the clean-ups, the cave is currently a desirable place for tourists, and is being visited regularly. At almost any time on any day, one or several cars are parked in the Kaumana parking lot, and people are viewing the cave entrances. A few people go deeper into the cave. This is an enormous value for tourism and as recreation for local residents. It should not be excluded from a thorough EIS of the project properties. Recreational cave explorers regularly visit and explore the far recesses of Kaumana Cave. Many of these cavers are members of the Hawai'i Speleological Survey, a part of the National Speleological Society. Detailed cave surveys have been done by experienced cave mappers, and these are available for use in a detailed EIS.

   Religious and spiritual uses: Although Kaumana Cave formed fairly recently, and does not contain Hawaiian burials or evidence of other use, ti wrapped offerings are regularly left just

   inside the entrances. Some of these contain pieces of coral, and the coral bits can be found around the Kaumana entrances. This indicates that religious use of the cave is still important to some people. Apart from traditional uses, many people find spiritual values by entering the deep cave.

   Historical use: Kaumana Cave has an interesting history. The flows were observed by many Hilo residents, and were reported in the Hilo newspapers. Observers even reported lava flowing through the tube below the Kaumana County Park entrance. The story of Princess Ruth Ke'elikolani who came from Maui and spent a night chanting in front of the lava flow, after which the flow stopped in spite of the dire predictions of the vulcanologists, is well known in Hilo. Early visitors to the cave chipped their names and dates into the glassy lava tube lining, and this is now part of the cave history. Electrical insulators attached to the cave wall indicate that at some past date, the cave had been wired for visitors. More recently, in the 1940's and '50's the cave was designated a fall out shelter. This history, although recent, deserves to be included in an EIS.

Description of Kaumana Cave beneath TMK 2-5-06-4, mauka of the Edita Street Entrance

This brief description is excerpted from the Puainako Extension EIS, App. D. It should not be substituted for a thorough cave survey and inventory which should be included in a Final EA and EIS.

0-40 feet: 2.5 ft. high, 35-40 ft. wide. Contains large boulders washed through the cave and jammed against the roof.
40-450 feet: 4-8 ft. high, 10-30 ft. wide. Cave splits into two passages at 400 ft., for 50 ft.
450-800 feet: 5-8 ft. high, 10-20 ft. wide. Many 'ohi'a roots and cave species
800-925 feet: 4-6 ft. high, 45 ft. wide. The passage splits into two. Ceiling collapses occur at the two intersections.
925-1300 feet: 5-8 ft. high, 10-20 ft. wide. Abundant 'ohi'a roots and cave species occur throughout.
1300-1700 feet: 4-8 ft. high, 20-60 ft. wide. Passage splits into two, and at 1500 feet, both passages split again, making 4 passages until 1700 feet. From 1500 to 1700 feet there are massive ceiling collapses.
1700-1850 feet: 7-12 ft. high, 10-18 ft. wide. Abundant 'ohi'a roots and cave species. Occasional ceiling breakdown.
1850-2350: 6-15 ft. high, 10-25 ft. wide. Roots and cave species occur throughout. Occasional ceiling breakdown.

References:

Wolf, E.W. & Jean Morris. 1996. Geologic Map of the Island of Hawaii. U.S. Department of the Interior, U.S. Geological Survey. Map 1 I-2524-A, Map 2 of 3.

Dept. of Public Works, County of Hawaii. Aug. 1993. Final Environmental Impact Statement, Puainako Street Extension and Widening. State of Hawaii, OEQC
p. 34: Map showing Kaumana Cave with TMK and road alignments

Stone, F.D. Appendix D. Kaumana Cave Impacts
Appendix F. Drainage

SB2898, Hawaii State Cave Protection Law, July 2002

Stone, F.D., F.G.Howarth, H. Hoch, and M. Asche. 2005. Root Communities in Lava Tubes. In. D.C. Culver and W.B. White (eds.). Encyclopedia of Caves. Elsevier Press.

Matthew G. Garica, Monica Moya, Michael N. Spilde, Fred D. Stone & Diana E. Northup. 2009. Discovering New Diversity Hawaiian Lava Tube Microbial Mats. Proceedings of International Congress of Speleology.

FREDERICK D. STONE: RESUME

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B.S., 1962; Cornell Univ.; Agronomy, Agricultural Engineering
M.S., 1969; Cornell Univ.; Entomology, Insect Ecology
Ph.D., 1983; Univ. Hawaii; Biogeography, Agricultural Geography, Ecosystem Management

RECENT EXPERIENCE:
Retired from Hawai'I Community College, 2008

Prof., Math & Natural Sciences Div.; Hawai`i Community College; Forest Ecosystem Management
Biology, Environmental Science, Geography, 1997-present
Instructor & Asst. Prof., Geography, Biology; Univ. of Hawai`i at Hilo, 1984-1990
Research Associate, Entomology; B.P. Bishop Museum, Honolulu, HI, 1981-present
Field research on systematics and evolution of cave species in Hawai`i, SoutheastAsia and Australia, Environmental Impact Studies, Natural Resource Inventories

RECENT PUBLICATIONS AND PRESENTATIONS

Stone, F.D., H. Croom, F.G. Howarth and S. James. 2008. Evolution of Hawaiian Surface and Cave Adapted Caconemobius Crickets. Presentation. International Society of Speleobiology. Fremantle, Australia.

Stone, F.D., F.G.Howarth, H. Hoch, and M. Asche. 2005. Root Communities in Lava Tubes. In. D.C. Culver and W.B. White (eds.). Encyclopedia of Caves. Elsevier Press.

Stone, F.D. 2004. Ecology and Evolution of Blattidae in the genus Nocticola. Presentation at the International Congress of Entomology, August, 2004, Brisbane, Australia.

Stone, F.D., D. Ward and A. Clarke. 2004. Report on Limestone Coast 2004 Post Conference Field Trip to Tasmania. ACKMA Journal.

Stone, F.D. 2004. Ecology and Evolution of Terrestrial Cave Communities: Management

Implications. LIMESTONE COAST 2004: IGCP448—Global Karst Correlation and The First International Workshop on Ramsar Subterranean Wetlands Naracoorte, South Australia.

Stone, F.D. & Sharon Ziegler-Chong. 2002. Building a Conservation Workforce for Hawai`i. Hawai`I Conservation Conference, Honolulu, HI, Poster session.

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Sept. 18, 2009

Dear Mr. Chee,

The Draft EA for Connections Charter School on p. 29 states:
"The lava tubes were formed in the core of the lava flow that covered the area in 1881-1882 with the roofs of the tubes being 20 to 25 feet thick in most places (McDonald et al,1983)."

I have been searching McDonald et al, 1983, Volcanoes in the Sea (as listed in the Draft EA references) to find the source of this citation. Unfortunately, the Draft EA omits the page of McDonald et al from which the statement is taken. I strongly urge you to include the exact reference in the Final EA, and to document it with scientific studies in an EIS.

In searching McDonald I have been unable to locate the "1881-1882" lava flow. Lava tubes are listed in McDonald on p. 23,26,27 and 29. Kaumana Cave in the 1881 flow is mentioned on p. 27. Table 3.1 on p. 64 lists the Mauna Loa flow that started on Nov. 1, 1880. On p. 179, Fig. 7.9 the 1881 flow is shown. Comparing this map with the Wolfe & Morris 1996 Geologic Map, the same flow is labeled the 1880-81 lava flow, and it is clearly the Kaumana flow. I do not believe McDonald et al made an error of one year for the Kaumana lava flow in their book.

Could the "20 to 25 feet thick" lava tube roof for the Kaumana lava flow, attributed to McDonald et al, also be a mistake? In the book, meters are used exclusively, so the reference to feet is clearly not taken directly from McDonald et al. The only reference I can find to a lava tube roof is on p. 27 (in the paragraph prior to the mention of Kaumana Cave). McDonald et al state: "Recently, a bulldozer clearing land on the slope of Kilauea volcano broke through the roof of a lava tube and dropped about 10 meters." This certainly does not give the impression of thick lava tube roofs that could be ignored in planning development over a lava tube. In fact, bulldozers breach lava tube roofs regularly on the Big Island. Recently, bulldozers clearing land over Kaumana lava tube for a Hawaiian Homes development just mauka of Kaumana Village broke through the roof of the tube. Fortunately the bulldozer didn't fall into the tube, and further development over the cave was stopped.

McDonald et al also discussed the 1881 lava flow on p. 170, in the chapter on Types of Eruption and Associated Hazards. "In 1881 a flow actually entered what is now Hilo, and only the end of the eruption prevented it from entering and eventually filling Hilo Harbor. The volume of the 1881 lava flow was about 182,000,000 cubic meters. If it had had a volume equal to that of the 1859 flow on the northwest slope of Mauna Loa—close to 450,000,000 cubic meters—there is little question that the harbor and the town would have been destroyed."

I sincerely hope that in the Final EA you will fully document, or correct, the statements attributed to McDonald et al.

In my initial comments, I included a description of Kaumana Cave beneath the proposed Charter School development, in order to give you a better idea of the actual size, potential collapse areas, and biological resources of the cave. I am now attaching a map showing the areas of concern.

Fred D. Stone, Ph.D. Fred Stone

Cc. Laura Thielen, Chairperson, DLNR
John Thatcher, Director, Connections Charter School

Description of Kaumana Cave beneath TMK 2-5-06-4, mauka of the Edita Street Entrance

This brief description is excerpted from the Puainako Extension EIS, App. D. It should not be substituted for a thorough cave survey and inventory which should be included in a Final EA and EIS. (See Figure 6)

0-40 feet: 2.5 ft. high, 35-40 ft. wide. Contains large boulders washed through the cave and jammed against the roof.
40-450 feet: 4-8 ft. high, 10-30 ft. wide. Cave splits into two passages at 400 ft., for 50 ft.
450-800 feet: 5-8 ft. high, 10-20 ft. wide. Many 'ohi'a roots and cave species
800-925 feet: 4-6 ft. high, 45 ft. wide. The passage splits into two. Ceiling collapses occur at the two intersections.
925-1300 feet: 5-8 ft. high, 10-20 ft. wide. Abundant 'ohi'a roots and cave species occur throughout.
1300-1700 feet: 4-8 ft. high, 20-60 ft. wide. Passage splits into two, and at 1500 feet, both passages split again, making 4 passages until 1700 feet. From 1500 to 1700 feet there are massive ceiling collapses.
1700-1850 feet: 7-12 ft. high, 10-18 ft. wide. Abundant 'ohi'a roots and cave species. Occasional ceiling breakdown.
1850-2350: 6-15 ft. high, 10-25 ft. wide. Roots and cave species occur throughout. Occasional ceiling breakdown.

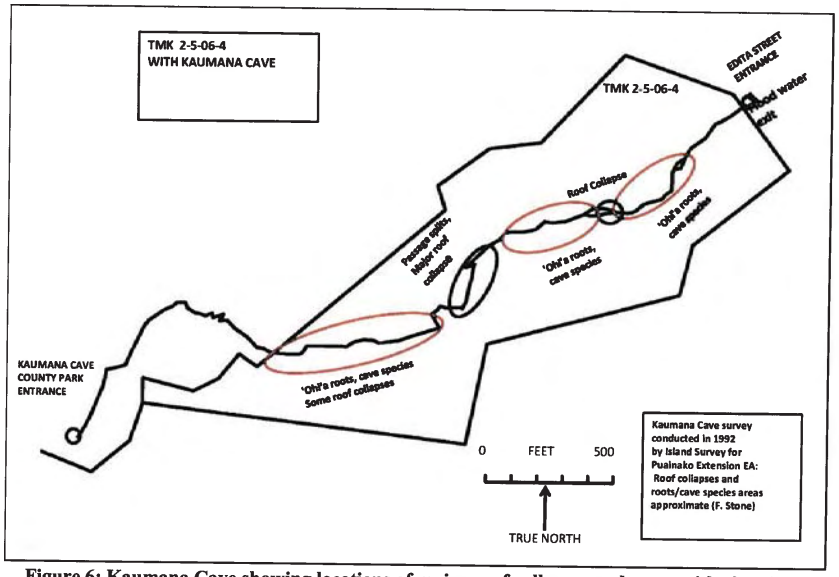

Figure 6: Kaumana Cave showing locations of major roof collapses and areas with abundant 'ohi'a roots and cave adapted invertebrate species.

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Fred D. Stone, Ph.D
P.O. Box 1430
Kurtistown, HI 96760

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Dr. Stone,

We have received your letters dated September 4 and September 18, 2009 concerning the Draft Environmental Assessment for the Connections Public Charter School (CPCS) Master Plan. Wil Chee - Planning & Environmental (WCP) and CPCS greatly appreciate the time and effort you committed to providing information regarding Kaūmana Cave. A detailed discussion of Kaūmana Cave and any impacts potentially resulting from the project was not omitted intentionally, and we are grateful for your efforts to make us aware of the cave system's sensitive nature.

One of the primary visions for the new campus is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this portion of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan. If you have any comments or suggestions regarding the reconfigured plan, please convey them to WCP and Mr. John Thatcher, CEO of CPCS, by May 28, 2010.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the reconfigured campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

Providing Services Since 1976
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Please find below our responses to your comments on the Draft EA for the Connections Public Charter School Master Plan.

Comment #1 – *The current plan has a strong potential of causing significant and irreversible environmental impacts on the cave and its specially adapted ecosystem.*

The campus plan has been changed to avoid any conflict with Kaūmana Cave and to avoid significant adverse impacts. With the exception of the walkway, no development is being proposed for the upper portion of the property, under which the accessible segment of Kaūmana Cave is located. A minimum 100-foot protective buffer surrounding the cave will be observed on both the upper and lower portions of the property.

Comment #2 – *The survey showing the location of Kaūmana Cave under the development was omitted from the Draft EA. This is a significant omission, given that the cave was surveyed by Island Survey as part of the Puainako Extension EIS (1993, p34).*

Now that you and others have so kindly provided us with copies of cave maps and references that document the cave's exact location, we will incorporate that information into the Revised Draft EA. With this new information, we have, as stated above, reconfigured the campus plan to avoid impacting Kaūmana Cave.

Comment #3 – *The Draft EA does not include the relevant parts of the Hawaii State Cave Protection Law (SH2898), which should be included in the Final EA and EIS.*

A section of the Revised Draft EA will include a discussion of the Hawaii Cave Protection Law, first passed in 2002, then amended in 2008 as HRS § 6D.

Comment #4 – *Hazards relating to construction over Kaūmana Cave have not been addressed adequately: the depth of the cave and the thickness of lava overlying the cave have not been adequately measured, with related liability and safety issues for surface development and for roof collapse within the cave. Clearing and grading over the cave could also have significant impacts on the cave ecosystem and hydrology.*

The reconfigured campus plan no longer proposes development over any portion of Kaūmana Cave, thereby eliminating the risk of complications related to cave depth and roof thickness. Nonetheless, available documentation will be reviewed and the thickness of the lava overlying the cave and the depth of the cave will be discussed in the Revised Draft EA. Development of major campus facilities will be limited to the lower parcel, maintaining a minimum 100-foot buffer between any school facility and the cave. No clearing or grading will occur over the cave.

Comment #5 – *The issues regarding the placement of the school on an area with recent lava flows has not been adequately addressed: the entire development is on the 128 year old 1880-1881 lava flow in the Mauna Kea/Mauna Loa Saddle zone, that regularly channels lava flows from Mauna Loa's upper northeast rift zone.*

The volcanic hazards section in the Revised Draft EA will be expanded to include a more thorough discussion of the proposed action's risk to exposure from volcanic hazards.

Comment #6 – *The hydrology of the area is inadequately analyzed. A thorough hydrological survey needs to be included in the Final EA and EIS, as was done for the Puainako Extension EIS (Appendix F, Drainage). The 1880-1881 lava flow followed an intermittent stream channel from above Kaūmana Village to below the planned development. The entire length of Kaūmana Cave beneath the development is a flood water channel on a perched aquifer. Runoff water from Kaūmana Drive is channeled into the cave, and contributes to major flooding of the cave down slope.*

The discussion of hydrology and groundwater resources will be expanded in the Revised Draft EA. How Kaūmana Cave functions within the hydrologic cycle at the project site will be included in the hydrology discussion as well.

The project would not increase the occurrence or severity of flooding from water discharge events from Kaūmana Cave. Unfortunately however, a drainage problem does already exist on Edita Street. The Revised Draft EA will discuss the problem of runoff channeled into the cave at higher elevations along Kaūmana Drive and how it impacts the drainage on Edita Street. However, solving the problem of flooding of Kaūmana Cave and the periodic overflow onto Edita Street is beyond the scope of the project. This is a watershed-wide issue that should be addressed by the responsible government agencies (e.g., County of Hawaii Department of Public Works).

Please note that at this stage of the planning process only conceptual plans are being prepared. The EA, which addresses the campus master plan, is needed to secure the land lease from the State of Hawai'i. Once the lease is obtained and further funding becomes available, the school can conduct additional studies, as needed, to prepare more detailed architectural and engineering plans during the design development phase. Such additional studies would include investigating storm water runoff and drainage in order to develop adequate grading and drainage plans to mitigate any potential flood hazards posed by Edita Street on the lower portion of the subject property. Further, in conformance with applicable county regulations storm water runoff from the project would be contained within the property's boundary and site improvements would not alter the drainage patterns of surrounding properties.

Comment #7 – *Alternative sites are not adequately addressed, except to state that there aren't any. Given the serious potential environmental impacts of the development, other sites should be presented and reasons for their acceptance or rejection should be detailed.*

The campus has been reconfigured to avoid significant adverse environmental impacts. The discussion pertaining to why alternative sites were rejected will be expanded in the Revised Draft EA.

Comment #8– *The cave biology was not included in the Draft EA (Appendix B), although it has been thoroughly studied and is well known (Puainako EIS, Appendix D).*

Discussion of flora and fauna will be expanded in the Revised Draft EA to include cave biology.

Comment #9 – *Alternative uses of Kaūmana Cave and the State land overlying it have not been adequately assessed:*

- *Science: geology, vulcanology, biology, microbiology*
- *Tourism, recreation*
- *Education*
- *Religious and spiritual use*
- *Historic values*

The intent of the environmental assessment is not to discuss alternative uses for Kaūmana Cave, but to determine the possible environmental impacts resulting from the proposed campus master plan. Exploring alternative uses for this site is beyond the scope of this project and environmental assessment. However, the Revised Draft EA will expand the relevant discussions to address potential impacts to these resources and activities as they relate to Kaūmana Cave.

As you know, the entrance to Kaūmana Cave is from a county park, located across Kaūmana Drive. However, the portion of the cave underlying the subject property is under the jurisdiction of the State Department of Land and Natural Resources (DLNR). If CPCS is successful in obtaining a land lease from the state, access to the portion Kaūmana Cave that is located within the boundaries of the leased land would still need to be approved by DLNR, and possibly the Land Board. It is our understanding that DLNR would consult with CPCS on all requests for entry to the cave to ensure that the activities for which the request is being made, does not interfere with the school's programs.

If you have issues with the uses and access to Kaūmana Cave, possibly you and others could be the driving force behind the formation of a non-profit organization to manage the cave resources and provide educational interpretation of the lava tube geology, ecology, religious, spiritual and historic values to residents and visitors. You may wish to consider working with DLNR to proactively manage the cave, as well as with CPCS to incorporate management activities as part of their educational program.

Comment #10 - *The Draft EA for Connections includes a citation from McDonald, 1983 regarding the depth of Kaūmana Cave. In searching McDonald 1983 the reference was unable to be verified.*

Thank you for pointing out the citation error. The discussion references a description of the lava tube contained in Roadside Geology of Hawaii (Hazlett & Hyndman, 1996). Much of Hazlett & Hyndman's information on the lava tube was sourced from Adams & von Seggern, 1969, Electronic Mapping of Hawaiian Lava Tubes. The source material will be reviewed and the discussion and citation corrected, as needed, in the Revised Draft EA.

Comment #11 - *Unable to locate information about an 1881-1882 lava flow, no information linked to such dates in Macdonald. Could the preparer have made a mistake?*

The dates of 1881-1882 were from Hazlett & Hyndman (1996). We will review the available documentation on Kaūmana Cave and revise the discussion as needed.

Comment #12 - *The only reference to the thickness of the lava tube roof in McDonald states that a bulldozer clearing land for a development broke through the roof of the cave and dropped 10 feet. This does not give the impression of a thick lava roof, etc.*

The citation regarding the thickness of the lava tube roof should have been attributed to Hazlett & Hyndman (1996), in which it is stated that in most places, the roof of Kaūmana Cave ranges from 20 feet to 25 feet. The available literature on Kaūmana Cave will be reviewed again and the relevant sections of the Revised Draft EA will be corrected and clarified, as needed.

We greatly appreciate the time and effort you put forth in your comments to the draft EA for this project. Your comments and contributions will help us to produce a better document. Again, if you have any suggestions on the enclosed reconfigured campus master plan, please let me know by May 28, 2010. I can be contacted by mail, email, or telephone.

Celia Shen
Wil Chee – Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814
808-596-4688
cshen@wcphawaii.com

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosure

New Mexico Tech
SCIENCE · ENGINEERING · RESEARCH · UNIVERSITY

September 6, 2009

Will Chee – Planning and Environmental
1018 Palm Drive
Honolulu, Hawaii 96814-1929

Dear Mr. Chee,

It has been brought to my attention that there is an application to create a school on property adjacent to, and partly overlying, the Kaumana Cave system, a notable lavatube complex in which I and my scientific colleagues have been conducting research. The prospect of construction close to this geologically and biologically significant feature is a matter of great concern to us for a series of reasons: 1) the scientific value of this site as we are revealing it through our research, 2) the danger to structures that are built above cavities, 3) the dreadful precedent that such a situation would create, contrary to my federal institute's efforts to alert the public that human structures should not be built above ANY type of cavity, whether lavatube or some other rock type common elsewhere in the United States, and 4) Kaumana Cave represents the natural wealth that is the rightful heritage of the Hawaiian people and this treasure should be protected for them and the rest of our species to appreciate and potentially use. Briefly, I will address these in order.

1) The scientific research we are conducting, in my capacity as professor and scientist at New Mexico Institute of Mining and Technology, centers around the unique microorganisms that are growing on the walls of this cave. I have enclosed an image of one example of these organisms courtesy of Dr. Kenneth Ingham, the cave photographer who works on our team. These organisms are spectacularly beautiful, even at the naked eye scale, but more importantly they are adapted to unique lavatube conditions. Many of them are new species to science as is being revealed by my colleague, Dr. Diana Northup at the University of New Mexico. These tiny creatures can use a large number of unusual materials, possibly even materials within the basalt, to make their living. I am investigating how they perform these chemical transformations and the compounds they produce as a byproduct. The microbial communities represent a wealth of potentially significant compounds that can be of enormous future value in medicine and industry. Different colonies have different appearances. The pink patches shown in the accompanying image produce an unusual pink water soluble pigment, yellow patches produce yellow pigments, and tan colonies produce an orange pigment. In preliminary trials, I have found that these pigments appear to inhibit the activity of surrounding bacteria, indicating that they are probably antibiotics. The unique minerals that are being produced by these organisms are another area of vigorous research by our mineralogist colleague Michael Spilde, Manager of the Scanning Electron Microscopy and Electron Microprobe Laboratories at the University of New Mexico.

2) Cavities are well known potential geohazards subject to shifting or collapse. This is as true of lavatubes as it is of limestone caves or other subsurface cavities. Such a situation can present near-term and long-term hazards to construction. Microfractures and larger cracks that occur,

even as the original system cools, gradually shift and weather over time and structural soundness is notoriously difficult to assess in such situations. Secondly, human activities produce fluid byproducts, e.g. grey water, sewage, landscaping run-off, that can infiltrate through fractures and enter the cavities below. These can present a potential human health hazard and repository for fecal coliforms and other disease agents. In addition, they present a dire danger to native microorganisms that can be out-competed for nutrients by these contaminant microbes from the surface. And obviously, such contamination is also a threat to larger animals including invertebrates of all types that may inhabit the tube system.

3) The National Cave and Karst Research Institute, of which I am Associate Director for Academics, is a federally mandated and supported institution devoted to educating the public, planners, and other stakeholders about issues to do with caves, karst landforms, associated water quality issues, and pollution and remediation issues in these types of environments. We are trying to get out the message that building above cavities is a very unwise policy, whether those cavities are lavatubes in Hawaii , or limestone or gypsum caves elsewhere. Sinkhole or tube collapse and pollution of subsurface environments, are all issues that have arisen when inappropriate siting decisions are made for residential, governmental, industrial, and other private uses. These poor decisions and their resulting consequences can extensively damage or destroy property and put human lives at risk. We are available to inform and offer advice to any that seek guidance from our technical expertise and resources in helping stakeholders make better decisions about living with cave and karst resources.

4) Hawaii is a unique place, as is well appreciated by those who live there, as well as those of us privileged to conduct research and visit the islands from time to time. The special relationship of the landscape to the native Hawaiian population, and those that have come after, cannot be over-emphasized. The lavatubes and their biological, mineralogical, and human artifactual contents are a magnificent and unusual part of that natural heritage. It is our ethical obligation and a wise practical policy to protect those resources from any unnecessary damage or other compromise.

I urge you to consider these vital issues as you go forth with the process of siting the school and to turn to other, more suitable locations. Please let us know, if we can assist you in any way.

Sincerely,

Dr. Penelope J. Boston

Penelope J. Boston, PhD
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WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Penelope J. Boston, Ph.D.
Director, Cave and Karst Studies Program
Associate Professor, Earth and Environmental Sciences Department
New Mexico Tech (NM Institute of Mining and Technology)
801 Leroy Place
Socorro, NM 87801

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Dr. Boston,

Thank you for your comments dated September 6, 2009 concerning the Draft Environmental Assessment for Connections Public Charter School (CPCS) Master Plan. Wil Chee - Planning & Environmental (WCP) and CPCS greatly appreciate the time and effort you committed to providing information regarding Kaūmana Cave. A detailed discussion of Kaūmana Cave and any impacts potentially resulting from the project was not omitted intentionally, and we are grateful for your efforts to make us aware of the cave system's sensitive nature.

One of the primary visions for the new campus design is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this segment of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the reconfigured campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

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In response to your comments on the Draft EA, we offer the following:

Comment #1 – *The scientific value of this site is important and invaluable.*

The revised campus master plan no longer proposes to build any structures on top of Kaūmana Cave. A minimum 100-foot protective buffer surrounding the cave will be observed on the both the upper and lower portions of the property. The buffer should be adequate to protect the cave's ecological system and the organisms that have adapted to the lava tube's uniquely specialized environment. Part of CPCS's vision is to establish an environmentally-sensitive center for education, and the school would not deliberately diminish the educational opportunities for others.

Comment #2 – *It is dangerous to build on top of caves and other cavities. This action would create a precedent, which has the potential to expose other development projects to the dangerous risks of developing over caves and cavities.*

There will no longer be any structures overlying any part of Kaūmana Cave. The 100-foot protective buffer should allay concerns regarding the structural integrity of the cave and the potential risks associated with developing over caves.

Comment #3 – *Kaumana Cave is a precious part of native Hawaiian heritage and should be protected.*

Kaūmana Cave was formed during the 1881 Mauna Loa flow. Given its relatively recent origins, the cave is unlikely to contain human burials or native Hawaiian historic/cultural material. However, there are known historic elements within the cave, such as pectoglyphs and electrical insulators attached to the cave wall. Because these elements date back more than 50 years, they do impart historic significance to the cave. We are conducting ongoing consultation with the State Historic Preservation Division to ensure that any historic and cultural resources would not be adversely affected by the project. Further, changes that have been made to campus plan should ensure that Kaūmana Cave will be protected.

We appreciate the time and effort you put forth in your comments on the draft. Thank you for participating in the environmental review process with us.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosure

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and Geology
270-745-4555
FAX: 270-745-6410

WESTERN KENTUCKY UNIVERSITY

Western Kentucky University
1 Big Red Way
Bowling Green, KY 42101-3576

September 3, 2009

Wil Chee – Planning and Environmental
Attn: Celia Shen or Richard Stook
1018 Palm Drive
Honolulu, Hawaii 96814

Subject: Comments regarding 2009-08-08 HA DEA Connections New Century Public Charter School of Kaumana

I am an environmental researcher who has conducted speleological, hydrological and resource inventory work in the Kaumana Cave System since 1996. According to the DEA for Connections New Century Public Charter School, the effects of the proposed development project will not have significantly adverse effects on the environment and as such is recommending that a FONSI be issued. However, a significant oversight in the DEA is the omission of Kaumana Cave System as an important environmental consideration. Though the relationship of Kaumana Cave to the project area is mentioned several times in the DEA, a location map of the cave is not included in the DEA. Sections of the cave have been mapped by Island Survey as part of another EIS (Puainako Extension) so it is surprising that such map is not included in the document. A topographic overlay with cave location included is critical for safe and environmentally responsible development and sustainability – two very important objectives that are noted in the DEA. In order to meet those objectives, a full Environmental Impact Study needs to be completed for the Connections Charter School development project.

There are several specific items in the DEA that need to be re-addressed:

Section 3.1.1 Topography, Geology and Soils

This section states that the lava tubes in the 1881-1882 flow have roof thicknesses that range between 20-25 feet in most places (McDonald et al, 1983). However, speleological surveys that have been conducted in the cave document roof thicknesses of 5 to 10 feet and even less in some places. Development work is at risk of causing cave roof collapse which should hold serious safety and liability concerns. A full assessment of roof thickness of the cave in the project area should be a priority. This can be accomplished by conducting and georeferencing an integrated cave/surface survey.

Section 3.1.2: Hydrology and Surface Water.

This section only takes into account the surface hydrology of the area and there is no mention whatsoever of groundwater. In fact a perennial underground stream, which is perched on layers of Pahala Ash, flows in the lower levels of Kaumana Cave. The recharge area for that stream is in and around Kaumana Town. The stream flows through the lower levels of the cave system, and discharges in the lower reaches of a storm drainage culvert on Edita Street. The stream continues to flow underground beyond the Edita Street culvert and it has been speculated that it recharges a major spring in Hilo. During storm events, the stream overflows its lower level confines and actually upwells into and flows through the main conduit of the cave system. Residents have reported that during major storm events, the Edita Street entrance discharges a heavy flow of water.

The groundwater hydrology of the cave system is vulnerable to surface pollution caused by faulty septic systems, contaminant transport from roadways, and from chemicals and sediment associated with urban and agricultural land use. Paving more surfaces for building and parking also increases the flood vulnerability of the area.

In order to responsibly manage the surface and groundwater hydrology associated with Kaumana Cave, a hydrologic study needs to be conducted to delineate the groundwater recharge area, identify underground flow routes, and to confirm points of discharge both during base level and storm flow conditions.

Section 3.1.4: Biological Resources

Though a biological survey of surface fauna and flora was conducted for the purpose of the DEA, there is no mention of the cave fauna of Kaumana Cave. This is a serious omission considering that these species exist ONLY in lava tubes on Hawai'i Island. A cave fauna survey was conducted in association with the EIS for the Puainako Extension so this information is available. Construction associated with development and land use activities that compromise the 'ohi'a trees above the cave system will have detrimental affects on the cave ecology since these are a major food source for the invertebrate fauna that live in the cave. Contaminant transport into the cave also poses a serious threat to its unique and significant underground ecosystem. The effects of development and land use on the underground ecosystem should be included an environmental impact study.

The intent of the EA was "to ensure that comprehensive and systematic consideration is given to potential impacts of the proposed action upon the natural and man-made environment." (Draft EA p. 7). However, omission of a map that shows the location and extent of the cave, along with no accurate assessment of the cave's relationship to surface topography, nor any assessment of the groundwater hydrology, or the cave's natural resources, indicates that comprehensive and systematic consideration has NOT be given to the impact of construction and development. These omissions not only potentially compromise Kaumana Cave System but also run contrary to Connections vision of "constructing a green school which would become a model of sustainable development and design" (Draft EA p. 13.)

Kaumana Cave System is important for its natural, historical and cultural resources. It is currently used for educational and research purposes, and is a popular touristic and recreational site. Any development in the area should address impacts within each of these contexts and as such a full environmental impact study is critically important.

If you have any questions about my comments, please don't hesitate to contact me.

Sincerely,

Patricia Kambesis

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Assistant Director
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WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Patricia Kambesis, Assistant Director
Hoffman Environmental Research Institute
Western Kentucky University
Bowling Green, Kentucky 42101

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Ms. Kambesis,

Thank you for your comments dated September 6, 2009 concerning the Draft Environmental Assessment for the Connections Public Charter School (CPCS) MasterPlan. Wil Chee - Planning & Environmental (WCP) and CPCS greatly appreciate the time and effort you committed to providing information regarding Kaūmana Cave.

One of the primary visions for the new campus is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this portion of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the modified campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

In response to your comments on the Draft EA, we offer the following:

Comment #1 –*The location of Kaūmana Cave and a discussion of the environmental impacts to the cave from the development has not been addressed in the DEA.*

Discussion of environmental impacts on Kaūmana Cave was not intentionally omitted, and we are grateful for your efforts to make us aware of the cave system's sensitive nature. The revised campus master plan no longer proposes to construct structures over any part of Kaūmana Cave. A minimum 100-foot protective buffer surrounding the cave will be observed on the both the upper and lower portions of the parcel to protect the cave system and to prevent risk of injury from collapse. The new campus master plan should ease concerns regarding impacts to the cave; however if any effects to Kaūmana Cave are anticipated to result from the revised campus plan, they will be discussed in the Revised Draft EA.

Comment #2 –*The cited thickness of the cave is in question, and speleological surveys have been conducted documenting the thickness to be 5 to 10 feet.*

We acknowledge your point that the Draft EA inaccurately discusses the roof thickness of the segment of Kaūmana Cave that traverses the subject property and we will correct this information in the Revised Draft EA. As part of CPCS's vision to create an environmentally sustainable and responsible campus, the master plan for the school has been modified to avoid impacting the cave. Structures are no longer proposed to overlie any part of Kaūmana Cave and a minimum 100-foot buffer surrounding the cave will be observed in which no clearing or grading will occur. This buffer should be adequate to protect the cave roof from accidental collapse.

Comment #3 –*There is no mention of groundwater hydrology in section 3.1.2. A hydrologic study needs to be conducted to understand groundwater hydrology.*

The discussion of hydrology and groundwater resources has been expanded in the Revised Draft EA. How Kaumana Cave functions within the hydrologic cycle at the project site is now included in the hydrology discussion as well. However, we believe that a hydrological study of the scope you indicate is not warranted for this project. While a watershed-wide hydrological study would be beneficial to better understand flooding conditions and to develop long-term flood prevention and protection measures throughout the watershed, CPCS should not bear that responsibility. A study of that magnitude should involve other stakeholders, such as the County of Hawaii Department of Public Works, as was done for the Wailuku-Alenaio Watershed.

The project would not increase the occurrence or severity of flooding from water discharge events from Kaūmana Cave. Unfortunately however, a drainage problem does already exist on Edita Street. The Revised Draft EA will discuss the problem of runoff channeled into the cave at higher elevations along Kaūmana Drive and how it impacts the drainage on Edita Street.

Please note that at this stage of the planning process only conceptual plans are being prepared. The EA addresses the campus master plan, which is needed to secure the land lease from the State of Hawai'i. Once the lease is obtained and further funding becomes

available, additional studies can be conducted as needed, to prepare more detailed architectural and engineering plans during the design development phase. Such additional studies would include investigating storm water runoff and drainage in order to develop adequate drainage plans to mitigate any flood hazards posed by Edita Street on the subject property.

Comment #4 –*A discussion of the flora and fauna of Kaumana Cave was omitted from the section discussing biologic resources. Disrupting the ohia trees will have a detrimental effect on the cave ecosystem.*

A new section is being added to the Revised Draft EA which discusses features and attributes of Kaūmana Cave, including biological resources. We acknowledge your point and concur that disturbing the ohia trees would have a detrimental effect on the ecosystem of Kaūmana Cave. As stated above, the revised campus master plan will maintain a minimum 100-foot buffer surrounding the cave in which no grading or clearing would occur. While an elevated walkway is being proposed for the upper parcel, this too would be located beyond the 100-foot cave buffer. This walkway would be a lightweight structure that would require shallow footings and posts to support and minimal clearing of trees.

We appreciate the time and effort you put forth in your comments to the draft EA for this project. Thank you for participating in the environmental review process with us.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosure

4 September 2009

Wil Chee – Planning and Environmental
Attn: Celia Shen or Richard Stook
1018 Palm Drive
Honolulu, Hawaii 96814

RE: Comments on 2009-08-08 HA, Draft E.A. for Connections New Century Public Charter School of Kaumana

To whom it may concern:

I am a research entomologist, who has been studying Hawaiian insects for nearly 40 years. My specialties include evolution and ecology of cave and mountain-top faunas, as well as the impacts of invasive non-native species in Hawai'i. I have been studying the ecology of Kaumana Cave since 1971. My comments on the draft environmental assessment are based on my research and are my personal views. They do not represent testimony from my employer, Bishop Museum.

I hereby strongly recommend that a full Environmental Impact Study be prepared for the Connections New Century Public Charter School of Kaumana. The draft EA is not an adequate disclosure document. There are significant gaps in the draft regarding both risks to public safety and impacts on natural resources posed by the proposed development. Mitigation of these risks and impacts may be possible, but only if they are identified and addressed in a full disclosure document that includes public input. There is a precedent in 1993, an EIS was prepared for the Puainako extension and widening project. That EIS addressed many concerns that have been minimized or omitted from the current draft EA for the Connections New Century Public Charter School development. A critical omission is a discussion of environmental concerns posed by the relationship of Kaumana Cave to the proposed project.

There are significant risks to the project posed by the potential for collapse of the cave roof during and subsequent to construction. A catastrophic roof collapse would represent serious safety and liability issues. The roof is much thinner than is claimed in the DEA as can be seen, for example, at the downslope overhang of the main county park entrance on Kaumana Drive. An accurate map of Kaumana Cave showing its relationship to the development should be included for planning and mitigation purposes. Even though the main risk of collapse would be associated with the lava tube, large cave-like voids may occur anywhere within the cavernous 1881 lava flow and may represent similar hazards.

The portion of Kaumana Cave that lies beneath the project area contains significant natural resources, including geological formations that are prime examples of volcanic processes and a unique underground ecosystem inhabited by blind obligate cave species, as well as cultural, religious and aesthetic values. The cave is easily accessible and extensively used for education, scientific research, religion, spiritual renewal, recreation and tourism. The cave and its resources fall under the Hawaii Cave Protection Law (2002) and, therefore deserve to be included in the EIS.

The rich natural resources of the cave along with its unique aesthetic qualities have been featured in many films and TV documentaries including productions shown on NOVA, Discovery Channel, BBC Natural History Programs, Open University, the JASON Project and NATURE. These films have not only educated and entertained millions of viewers worldwide; they have also helped advertise Hawai'i and its natural wonders to the tourism industry. If Kaumana Cave and its resources are seriously impacted, this use will end, denying the educational community of a valuable resource and the favorable international publicity given the Hawaiian natural environment.

Although surveys of the surface fauna and flora were included in the DEA, no mention is made of the significant subterranean fauna that lives in the cave. This is especially surprising since the entomologist conducting the surface survey should have known of the cave fauna. The omission is a serious lacuna that should be filled. We have over 35 years of data on the distribution, population trends and ecology for many of the species present within the cave.

The discovery of a specialized cave fauna within the 90-year old Kaumana Cave in 1971 presented quite a shock to conventional wisdom on the origin of cave faunas (Howarth, 1972, SCIENCE 75:325). Surprisingly, four obligate cave species had already colonized the cave by 1971 – a mere 90 years after formation. Significantly, three additional obligate cave species have colonized the cave during the past two decades. They arrived by dispersing through underground spaces from neighboring flows. At least another five species are known from older caves on eastern Mauna Loa and Kilauea and are expected to colonize the cave eventually. Two of the species in Kaumana Cave have been listed as "species of concern" by the U.S. FWS (**Table 1**). Kaumana Lava Tube is currently the best site anywhere in the world to witness and study succession and community development in cave ecosystems.

Table 1. Some interesting cave species known from Kaumana
**Sinella yosiia* Bellinger & Christiansen, 1974 (Hawai'i Cave Springtail)
**Nannolene* species [new to science] (Kaumana cave millipede). Distinct population is endemic to Kaumana!
**Cavaticovelia aaa* (Hawai'i cave water treader) [listed by USFWS as "species of concern"].
**Tachys* species [new to science] (Hawai'i cave ground beetle)
**Caconemobius varius* (Hawai'i cave rock cricket) [listed by USFWS as "species of concern"].
**Caconemobius uuku* (Hawai'i cave rock cricket)
Forcipomyia pholeter (Hawai'i cave midge)
**Oliarus polyphemus* (Kaumana cave planthopper). Distinct population is endemic to Kaumana!
Schrankia howarthi (Hawai'i Cave Moth)

* = Pale blind species obligately restricted to caves and cave-like habitats.

Adding to the cave's significance is the 38 years of historical data. More than 40 papers have been published that included results of biological studies conducted in the cave (see attached reference list). In addition, research that was part of at least four theses for advanced degrees was conducted in the cave. The foundation grants that funded many of these studies represent a significant infusion of education and science funding into the state's economy.

Breaches of the cave through collapse, increases in pollution, changes in hydrology and destruction of the surface environment resulting from the development will seriously impact the biological and other resources within the cave, and likely end the scientific studies that are on-going in the cave. The main food resource supporting the underground community is ohia tree roots (**Figure 1**). Destruction of the vegetation and paving the surface as proposed will permanently damage the cave ecosystem and its specialized inhabitants. The effects of the proposed development along with mitigation procedures should be described in detail in an environmental impact study.

Figure 1. Ohia roots in Kaumana Cave
(Photo by FGHowarth)

In conclusion, Kaumana Cave System contains highly significant natural resources, which could be critically impacted by development over or adjacent to the cave. A thorough environmental impact study is warranted.

Thank you for your attention.

Francis G. Howarth, Ph.D.
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Theses generated from research in Kaumana

Fritzler, C.: UH-Manoa (cave millipedes)
Wessel, A., Humboldt Univ., Berlin (Hawaiian *Oliarus*)
Medeiros, M., UC Berkeley – (Hawaiian *Schrankia)*
Williamson, K.: Washington University (cave *Oliarus)*

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Francis G. Howarth, Ph.D.
1558 Monte Street
Honolulu, HI 96819

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Dr. Howarth,

Thank you for your comments dated September 4, 2009 concerning the Draft Environmental Assessment for the Connections Public Charter School (CPCS) Master Plan. Wil Chee-Planning and Environmental (WCP) and CPCS greatly appreciate the time and effort you committed to providing information regarding Kaūmana Cave. A detailed discussion of Kaūmana Cave and any impacts potentially resulting from the project was not omitted intentionally, and we are grateful for your efforts to make us aware of the cave system's sensitive nature. We also thank your for providing a bibliography of your publications over the years related to Kaūmana Cave. During preparation of the Draft EA, we did conduct a literature search for information on the Kaūmana cave and only found very generalized information. The sources you provide are very specialized and appear to be found primarily in professional or very specialized journals that are not readily available to the public.

One of the primary visions for the new campus is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this segment of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect the Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the reconfigured campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

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1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@wcphawaii.com

Please find below our responses to your comments on the Draft EA for the Connections Public Charter School Master Plan.

Comment #1 – *Strong recommendation of a full environmental impact statement based on significant gaps in the discussion of environmental impacts and mitigation measures.*

Given the changes that are being made to the campus master plan to avoid the Kaūmana Cave and associated impacts, we believe that a full environmental impact statement for the project is not warranted. As stated above, a Revised Draft EA that addresses the reconfigured campus plan, its potential effects, and mitigation measures, as warranted, will be issued and made available for public review.

Comment #2 – *There are concerns with the thickness of the lava tube roof, and collapse poses a significant risk that needs to be addressed.*

The revised campus master plan no longer proposes to build any structures on top of Kaūmana Cave. A minimum 100-foot protective buffer surrounding the cave will be observed on the both the upper and lower portions of the property. No clearing, grading or construction work will be conducted within this 100-foot buffer. The buffer should be adequate to protect the cave roof from accidental collapse.

Comment #3 – *The resources of Kaumana Cave, the Hawaii Cave Protection Law, and impacts to the cave from the proposed development need to be discussed in the document.*

A new section will be added to the Revised Draft EA, which discusses the unique resources of Kaūmana Cave and the Hawai'i Cave Protection Law. With the revised campus plan, we do not anticipate any significant adverse impacts to Kaūmana Cave; however if any potential effects are identified, they will be discussed.

Comment #4 – *A discussion of the flora and fauna of Kaumana Cave was omitted from the section discussing biological resources of the site.*

The flora and fauna discussion will be expanded in the Revised Draft EA to include the biological resources of Kaūmana Cave.

Comment #5 – *Destruction of the ohia trees at the surface creates a significant negative impact to the cave ecosystem.*

A new section is being added to the Revised Draft EA which discusses features and attributes of Kaūmana Cave, including its biological resources. We acknowledge your point and concur that disturbing the ohia trees would have a detrimental effect on the ecosystem of Kaūmana Cave. As stated above, the revised campus master plan will maintain a minimum 100-foot buffer surrounding the cave in which no grading or clearing would occur. While an elevated walkway is being proposed for the upper parcel, this too would be located beyond the 100-foot cave buffer. This walkway would be a lightweight structure that would require shallow footings and posts for support and minimal clearing of trees.

We appreciate the time and effort you put forth in your comments to the draft EA for this project. Thank you for participating in the environmental review process with us.

Sincerely,

Celia Shen,
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosure

Sierra Club Moku Loa Group
P. O. Box 1137
Hilo HI 96721

September 5, 2009

Wil Chee—Planning and Environmental
Celia Shen / Richard Stook
1018 Palm Drive
Honolulu HI 96814

Aloha,

Moku Loa Group of the Sierra Club Hawaii Chapter represents a membership of over 1000 residents of Hawaii Island. Our review of the Draft Environmental Assessment for the Connections New Century Public Charter School, proposed for TMK (3) 2-5-006:141 leads us to find that there are significant potential environmental impacts not disclosed in this study.

The stated purpose of the EA is to ensure that comprehensive and systematic consideration is given to potential impacts of the proposed action on the natural environment. While 1.5 Determination states the effects will not have a significant adverse effect on the environment, we do not believe that all potential impacts have been described or evaluated. A Finding of No Significant Impact should not be recommended for this project, and a full EIS is requested.

Kaumana Cave is a treasure, both for its scientific value, and for the recreational opportunities it offers to people all over the world. The subject property overlies this resource, and the proposed project has the potential to alter the cave environment to its detriment.

The cave channel is wide, high and full of interesting features throughout the upper portion of the property. During my work at the University of Hawaii I have taken part in numerous field trips and excursions for groups of students, visiting scientists, conference participants and Hilo residents. The proximity of the cave to the University and the recreational value for tourism should lead to an analysis of the socioeconomic impacts of the proposed project

The scientific studies conducted in this cave led to discoveries of cave invertebrates with unusual adaptations for living in the moist dark 'ohi'a root zone, such as mating songs specific to species living in particular parts of the cave environment. An expert working with NASA on microbiologic habitats in Kaumana Cave has recently discovered new and undescribed forms of life which utilize the rock substrate as a nutrient source. Scientists working on the root environment in the lava tube have published papers on the important contributions these microhabitats have on the forest environment above.

For this reason, a full examination of the project for the potential impact on the natural resources must include the impact of forest clearing, grading, terrain alteration, collapse, septic wastewater contamination, pesticide application on the subterranean invertebrate communities, agricultural nutrient enrichment of the thin soil substrate, and more, on the scientific value of the Kaumana cave.

We are mystified that although the project consultants are aware of the cave, only consideration of the terrestrial flora and fauna were included in the studies. Likewise, a map of the cave was not included although the document refers to the selection of an alternate site for the Puainako Extension road due, in large part, to concerns regarding the cave feature.

A cursory reference to the thickness of the lava substrate in the upper portion of the proposed project is not substantiated by any survey in the appendices. The collapse of a cave is a common occurrence when bulldozing takes place over a large cavern, and presents a danger both to the construction crew and to the project outcome. For this reason, a characterization of the cave and its relation to the surface should be included.

Kaumana Cave is listed in virtually every tourist publication printed or published about the Big Island. How would a person who visits the cave feel if they knew that multiple septic multiple systems (built to manage the human waste of 300 people) were seeping to the permeable rock above their heads? The project, as described, would do just this.

While it is clear to us that ground alteration and tree removal would adversely affect the known Kaumana cave section of the upper lot, we are not currently aware of the subterranean characteristics of the lower lot. It may be that school construction on the lower lot could be accomplished without significant environmental impact, and we request that this alternative be evaluated.

We request a full disclosure and discussion of these issues in the final Environmental Assessment. Further, we request that an Environmental Impact Study be conducted, and that it include a thorough examination of the potential significant adverse and substantial environmental impacts on this highly prized resource. I would further request that Sierra Club Moku Loa Group be included in the scoping for the EIS.

Please note and correct the following errata:
Numerous misspellings of Gerrish (Garish, Garrish) references in AECOS Appendix

Ua mau ke ea o ka 'aina I ka pono

Sincerely,

Deborah Ward
Conservation Committee, Sierra Club Moku Loa Group
Please send responses to both addresses:

Deborah Ward
P.O. Box 918
Kurtistown HI 96760

Sierra Club Moku Loa Group
P. O. Box 1137
Hilo HI 96721

Cc:
John L. Thatcher LL CEO
Connections Public Charter School
174 Kamehameha Ave
Hilo HI 96720

Laura Theilen, Chair, BLNR
Kalanimoku Bldg
Punchbowl St
Honolulu HI 96813

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Deborah Ward
Conservation Committee
Sierra Club Moku Loa Group
P.O. Box 1137
Hilo, HI 96721

Deborah Ward
P.O. Box 918
Kurtistown, HI 96760

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Ms. Ward,

Thank you for your comments dated September 5, 2009 concerning the Draft Environmental Assessment for the Connections Public Charter School (CPCS) Master Plan. Wil Chee – Planning & Environmental (WCP) and CPCS appreciate the time and effort you committed to providing information regarding Kaūmana Cave. A detailed discussion of Kaūmana Cave and any impacts potentially resulting from the project was not omitted intentionally, and we are grateful for your efforts to make us aware of the cave system's sensitive nature.

One of the primary visions for the new campus is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. After further research and review, it was determined that reconfiguring the campus layout to avoid the cave and any potential conflicts was prudent. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel, indications are that this portion of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the reconfigured campus layout, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

In response to your comments on the Draft EA, we offer the following:

Comment #1 – *A full disclosure of environmental impacts was not performed in this document. A discussion of the many impacts to Kaumana Cave was not included. Therefore a Finding of No Significant Impact should not be recommended and a full EIS is requested.*

Impacts to Kaūmana Cave were inadvertently overlooked. As mentioned previously, the campus layout is being reconfigured to avoid Kaūmana cave. School buildings would not be developed on the upper parcel (above Edita Street) under which the accessible portion of the cave is located. Campus buildings would be developed exclusively on the lower parcel, and a minimum 100-foot protective buffer around the small segment of the cave system known to exist near the northern edge of the property would be observed.

Comment #2 – *A discussion of the flora and fauna of Kaumana Cave was omitted.*

A discussion of the cave's biological resources will be included Revised Draft EA.

Comment #3 – *Concern expressed about the thickness of the lava tube roof.*

Existing information that addresses the estimated thickness of the lava tube roof will be investigated and information included in the Revised Draft EA. However, since no development is being planned directly over the alignment of Kaūmana Cave, or within 100-feet of the cave, risk of collapse resulting from the proposed project should no longer be an issue for CPCS.

Comment #4 – *Concern expressed about use of a septic system at the project site in relation to location of Kaumana Cave.*

Because the reconfigured campus layout limits major development to the property's lower parcel, there will be no septic system within close proximity to Kaūmana Cave. Please note that the EA addresses the proposed master plan for the campus. Detailed design and engineering have yet to be undertaken for the project. Other more environmentally-friendly methods to treat wastewater on site are being explored.

Comment #5 – *Request that an alternative be developed to limit construction to the lower portion of the parcel, as well as information about the subterranean character of this portion of the parcel.*

As state above, a reconfigured campus plan is being developed that limits construction of major school facilities to the lower portion of the property. Please note that at this stage of the planning process only conceptual plans are being prepared. The EA addresses the campus master plan, which is needed to secure the land lease from the State of Hawai'i. Once the lease is obtained and further funding becomes available, additional studies can be

conducted as needed, to prepare more detailed architectural and engineering plans during the design development phase. Such additional studies would likely include a geotechnical survey of the areas to be built upon in order to develop adequate structural designs needed safely support school facilities.

We appreciate the time and effort you put forth in your comments to the draft EA for this project. Thank you for participating in the environmental review process with us.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosure

September 4,2009

Will Chee Planning and Development
1018 Palm Drive
Honolulu, HI 96814

Dear Mr. Chee,

I am commenting on the proposal to build a school campus for Connections Charter School over the Kaumana Cave in Hilo.

The stability of this (or any) lava tube is in question, particularly on the seismically active island of Hawai'i. Despite what is stated in the proposal, no scientific survey of the cave's roof or its stability has been performed. The safety of students and school staff would be in jeopardy, as would the safety of heavy equipment operators working on construction.

Earthquakes, including major ones, are common on the Island of Hawai'i. Heavy rains commonly send tremendous amounts of water down from both Mauna Loa and Mauna Kea into the watershed/lavashed that this area includes. Both floods and earthquakes can destabilize large lava tubes.

Kaumana Cave is a natural resource used by many visitors and students to learn about the features and wonders of lava tubes. Proposing to build on top of it will likely include damage to the cave, accidentally or purposely (attempting to stabilize structures on top). There are many poor ways to try to stabilize lava tubes and few good ones.

Lava tubes and other caves are commonly included in Hawaiian sacred places. Many include burials and other religious sites. Damage to Kaumana Cave in the course of this construction would show a lack of respect for Hawaiian culture.

Due to the presence of Kaumana Cave, I do not believe that the Connections Charter School project should be approved at this site.

Sincerely,

Ruth Levin
P.O. Box 1118
Volcano, HI 96785

WIL CHEE – PLANNING & ENVIRONMENTAL

May 7, 2010

Ruth Levin
P.O. Box 1118
Volcano, HI 96785

Subject: Draft Environmental Assessment for Connections Public Charter School Master Plan, South Hilo, Hawai'i, TMK (3) 2-5-006:141

Dear Ms. Levin,

Thank you for your comments dated September 4, 2009 concerning the Draft Environmental Assessment for the Connections Public Charter School (CPCS) Master Plan. Wil Chee – Planning & Environmental (WCP) and CPCS greatly appreciate the time and effort you committed to providing information regarding Kaūmana Cave. A detailed discussion of Kaūmana Cave and any impacts potentially resulting from the project was not omitted intentionally, and we are grateful for your efforts to make us aware of the cave system's sensitive nature.

One of the primary visions for the new campus is to develop the property in an environmentally friendly and responsible way, with particular effort to leave as much of the natural environment intact as possible. Due to the comments that we received regarding Kaūmana Cave, CPCS and WCP have decided to reconfigure the site plan for this project in order to avoid the cave and any potential conflicts. Development of major school facilities are now being proposed within the property's lower parcel, below Edita Street. While a small segment of Kaūmana Cave may underlie a portion of the lower parcel's northern corner, indications are that this segment of the cave was closed off when Edita Street was constructed in the 1950s, and is likely inaccessible. Due to safety concerns and to protect the Kaūmana Cave, the revised campus plan will maintain a minimum 100-foot buffer between any school facility and the cave. Enclosed for your information is a brief description and conceptual drawings of the reconfigured campus plan.

CPCS and WCP are preparing a Revised Draft EA for this project, which will address the reconfigured campus plan, any potential effects on Kaūmana Cave and mitigation measures, as warranted.

In response to your comments on the Draft EA, we offer the following:

Comment #1 – *The stability of the lava tube is in question. The safety of the students, staff, and construction workers would be in jeopardy.*

There will no longer be any structures built overlying any part of Kaūmana Cave. A 100-foot protective buffer surrounding the cave will be observed on the both the upper and lower

portions of the property to protect the cave system and to prevent risk of injury from collapse.

Comment #2 – *Risk of damage to Kaumana Cave from the proposed project is a concern.*

The condition of Kaūmana Cave is also a concern to CPCS and WCP. The campus plan has been revised to avoid damaging the cave. As state above, a minimum 100-foot buffer will be maintained between any school facility and the cave. Thus, no grading or clearing of land above or near the cave will occur.

Comment #3 – *Damaging Kaumana Cave would show a lack of respect for Hawaiian culture.*

Kaūmana Cave was formed during the 1881 Mauna Loa flow. Given its relatively recent origins, the cave is unlikely to contain human burials or native Hawaiian historic/cultural material. However, there are known historic elements within the cave, such as pectoglyphs (names and dates pecked into cave walls) and electrical insulators attached to the cave wall. Because these elements date back more than 50 years, they do impart historic significance to the cave. We are conducting ongoing consultation with the State Historic Preservation Division to ensure that any historic and cultural resources would not be adversely affected by the project. The revised campus plan should alleviate any concerns regarding the cave's structural integrity or impacts to the historic, cultural and natural resources associated with the cave.

We appreciate the time and effort you put forth in your comments to the draft EA for this project. Thank you for participating in the environmental review process with us.

Sincerely,

Celia Shen
Planner

cc. John L. Thatcher II, CEO Connections Public Charter School

Enclosures

Appendix C
Revised Draft EA Comment Letters and Responses

LINDA LINGLE
GOVERNOR OF HAWAII

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

Wat. Section

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 24, 2010

RECEIVED
LAND DIVISION
2010 SEP -7 P 3:11
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
- x Div. of Aquatic Resources
- Div. of ~~Boating & Ocean~~ Recreation
- x Engineering Division
- x Div. of Forestry & Wildlife
- ~~Div. of State Parks~~
- x Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- x Land Division –Hawaii
- Historic Preservation

Charlene

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Revised Draft Environmental Assessment for Connections Public Charter School Campus Master Plan
LOCATION: Island of Hawaii
APPLICANT: Wil Chee Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 20, 2010.

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

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

Signed: Paul J. Conry
Date: SEP - 3 2010

PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Paul J. Conry
Administrator
Dept. of Land and Natural Resources, Division of Forestry and Wildlife
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Conry,

We have received your memorandum dated September 3, 2010 informing us that you have no objections to the project referenced above.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

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

August 24, 2010

RECEIVED
LAND DIVISION
2010 SEP -1 A 10:39
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
__Div. of State Parks
x Commission on Water Resource Management
__Office of Conservation & Coastal Lands
x Land Division –Hawaii
__Historic Preservation

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Revised Draft Environmental Assessment for Connections Public Charter School Campus Master Plan
LOCATION: Island of Hawaii
APPLICANT: Wil Chee Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 20, 2010.

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: 8.31.10

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Dept. of Land and Natural Resources, Land Division Hawai'i District
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Sir/Madam,

We have received your memorandum dated August 31, 2010 informing us that you have no comments on the project at this time.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

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Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

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

August 24, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
~~Div. of Boating & Ocean Recreation~~
x Engineering Division
x ~~Div. of Forestry & Wildlife~~
Div. of State Parks
x Commission on Water Resource Management
Office of Conservation & Coastal Lands
x Land Division –Hawaii
Historic Preservation

RECEIVED
LAND DIVISION
2010 SEP 10 A 8:57
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
AUG 24 PM 4:38 ENGINEERING

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Revised Draft Environmental Assessment for Connections Public Charter School Campus Master Plan
LOCATION: Island of Hawaii
APPLICANT: Wil Chee Planning & Environmental

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 20, 2010.

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: 9/2/10

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Charlene Unoki
REF: RevisedDEAforConnectionsPublicCharterSchoolCampusMasterPlan Hawaii.012

COMMENTS

(X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.

( ) Please take note that the remainder of the project site according to the Flood Insurance Rate Map (FIRM), is located in Zones ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

() Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

(X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, ACTING CHIEF ENGINEER
Date: 9/2/10

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Carty S. Chang
Acting Chief Engineer
Dept. of Land and Natural Resources, Engineering Division
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Chang,

We have received your comments dated September 8, 2010 concerning the above referenced Revised Draft EA. We acknowledge your confirmation that the project site is located in Flood Zone X, according to the Flood Insurance Rate Map. Water demands and calculations will be provided to the Engineering Division to be included in the State's Water Projects Plan when they become available.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

RECEIVED
LAND DIVISION
2010 SEP 21 A 7:59
DEPT. OF & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

September 15, 2010

REF: Connections New Century School.Revised-DEA.doc

TO: Morris Atta, Administrator
Land Division

FROM: Lenore N. Ohye, Acting Deputy Director
Commission on Water Resource Management

SUBJECT: Revised Draft Environmental Assessment for Connections Public Charter School Campus Master Plan

FILE NO.: NA
TMK NO.: (3) 2-5-006:141

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwrm.

Our comments related to water resources are checked off below.

☒ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☒ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/pp/index.htm.

☒ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

☒ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/resources_permits.htm.

☐ 8. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water.

☒ 9. A Well Construction Permit(s) is (are) required before any well construction work begins.

☒ 10. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 11. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 12. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 13. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.

☐ 14. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.

☐ 15. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 16. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER:
The water demand for this project based on a total of 435 students (@ 60 gallons/student) is 26,100 gpd. This demand is well above the stated 4,200 gpd currently available from Hawaii DWS. While the planned use of harvested rainwater for non-potable uses may reduce the actual potable demand, there should be analyses to estimate what the acutal demand for potable water would be. If new well construction is required, CWRM permits are required and further analysis should be done to determine if the well/pump capacity would adversely impact the underlying aquifer system or any existing wells in the area. We recommend that any new permits for well construction or pump installation be thoroughly discussed in the final version of the enviornmental assessment.

If there are any questions, please contact Lenore Ohye at 587-0216.

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Lenore N. Ohye
Acting Deputy Director
Dept. of Land and Natural Resources, Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Ms. Ohye,

We have received your memorandum dated September 15, 2010 concerning the above referenced Revised Draft EA. In response to your comments, we offer the following:

1. *We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan.*

During design development, the County of Hawai'i DWS would be provided with maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i. Calculations would quantify the estimated water demand for the proposed project, so that it can be included in the county's water plan.

2. *We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources.*

The use of water efficient fixtures is already being planned for the new campus. The specific types of fixtures will be determined during the design phase of the project. As it is the school's intent to develop a sustainable campus, water efficient practices would also be implemented once the school is in operation.

3. *We recommend the use of best management practices (BMPs) for stormwater management to minimize the impact of he project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events.*

In the short-term, appropriate BMPs would be implemented during construction to minimize the potential for stormwater impacts. In the long-term, the campus would be designed using Low Impact Development strategies to reduce and manage stormwater runoff from the site.

4. We recommend the use of alternative water sources, wherever practicable.

Because of the limited amount of water to be provided by DWS, Connections already plans to utilize alternative water sources (rainwater catchment and recycled water) to the maximum extent possible. Alternative water sources would be used for all non-potable uses, including toilet flushing, landscape irrigation and for the agricultural program.

5. While the planned use of harvested rainwater for non-potable uses may reduce the actual potable demand, there should be analyses to estimate what the actual demand for potable water would be. If new well construction is required, CWRM permits are required and further analysis should be done to determine if the well/pump capacity would adversely impact the underlying aquifer system or any existing wells in the area. We recommend that any new permits for well construction or pump installation be thoroughly discussed in the final version of the environmental assessment.

It is Connections intention to develop an environmentally sustainable campus, which includes minimizing its use of fresh potable water. Every effort would be made to meet the school's water needs with alternative water sources (i.e., rainwater and recycled water), which would be given priority consideration above potable well development. Use of rainwater and recycled water would be utilized to the maximum extent possible, not only to reduce their demand on the municipal water supply, but to demonstrate their commitment to sustainability.

During the project's design phase, detailed analysis would be conducted to generate a more accurate estimate of potable water demand. Analysis would take into account, among other things, the number and type of fixtures to be used in the facility (e.g., waterless urinals, high efficiency, dual-flush toilets, etc.), to what extent rainwater and recycled water can be utilized in place of potable water, and if needed, where development plans could be scaled back to contain potable water demands within the DWS allocation. For example, Connections could choose to retain certain functions at the Kress building in downtown Hilo (e.g., kitchen), which would further reduce the potable water usage at the project site.

However, if during design development, it becomes evident that developing a potable may be needed, additional detailed analyses would be conducted to determine any potential adverse effects associated with this alternative, including impacts on other wells and the underlying aquifer. If warranted, a Supplemental EA could be prepared specifically to address this issue if its implementation emerges as a viable option.

An expanded discussion related to the project's water supply, including permits and requirements related to potable well development, is included in the Final EA.

6. Requirement for a Well Construction Permit and a Pump Installation Permit.

Discussion related to these permits has been added to the Final EA.

Thank you for your comments and for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
DOH/CWB

09064PSS.10

September 27, 2010

Mr. John L. Thatcher II, CEO
Connections Public Charter School
174 Kamehameha Avenue
Hilo, Hawaii 96720

Subject: Comments on the Revised Draft Environmental Assessment (DEA) for the Connections Public Charter School Master Plan
South Hilo, Island of Hawaii, Hawaii
TMK: (3) 2-5-006:141

Dear Mr. Thatcher:

The Department of Health (DOH), Clean Water Branch (CWB) has reviewed the subject document and offers these comments on the project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting the applicable Notice of Intent (NOI) forms:

   a. Storm water associated with construction activities, including excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the start of the construction activities.

   b. Discharges of hydrotesting water.

   c. Discharges of construction activity dewatering.

   You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

3. For types of wastewater discharges not covered by an NPDES general permit or discharges to Class AA or Class 1 State waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage is required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

SS:ml

c: Ms. Celia Shen, Wil Chee - Planning & Environmental
[via e-mail cshen@wcphawaii.com only]
DOH-EPO I-3312 [via e-mail only]

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Alec Wong, P.E., Chief
State Department of Health, Clean Water Branch
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Wong,

We have received your comments dated September 27, 2010 concerning the above referenced Revised Draft EA. We acknowledge your comment that if the proposed project has the potential to impact State waters it must meet the Antidegradation policy, Designated uses, and water quality criteria. We also note that a general or an individual National Pollution Discharge Elimination System (NPDES) permit may be required for the project and that the project must comply with the State's Water Quality Standards, regardless of whether or not NPDES permit coverage is required. Notation of these applicable regulations will be made in the Final EA.

Thank you for providing this information and for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O.BOX 3378
HONOLULU, HAWAII 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EMD/SDWB

September 30, 2010

Mr. John L. Thatcher II, CEO
Connections Public Charter School
174 Kamehameha Avenue
Hilo, Hawaii 96720

Dear Mr. Thatcher:

SUBJECT: CONNECTIONS PUBLIC CHARTER SCHOOL MASTER PLAN
REVISED DRAFT ENVIRONMENTAL ASSESSMENT
SOUTH HILO, HAWAII; TMK (3) 2-5-006:141

The Safe Drinking Water Branch has reviewed the subject document and offers the following comments:

1. The subject document indicates that potable water will be provided through a connection with the existing County of Hawaii, Department of Water Supply infrastructure up to 4,200 gpd and non-potable water supply will be provided through an on-site rain catchment system.

   a. All projects, which propose the use of dual water systems or the use of a non-potable water system in proximity to an existing potable water system to meet irrigation or other needs, must be carefully designed and operated these systems to prevent the cross-connection of these systems and prevent the possibility of backflow of water from the non-potable system to the potable system. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the potable water supply. In addition, backflow devices must be tested periodically to assure their proper operation. Further, all non-potable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption of non-potable water. Compliance with Hawaii Administrative Rules, Title 11, Chapter 11-21, titled "Cross-Connection and Backflow Control" is also required.

2. Additionally, the draft EA indicates that if it is determined that the estimated potable water demands cannot be contained below the allowable maximum of 4,200 gpd, the project will be scaled back or other sources of potable water could be investigated (e.g., wells).

   a. A well developed for this project will qualify as a source that serves a regulated public water system. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, entitled "Rules Relating to Potable Water Systems."

   b. All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial and financial capacity to enable the system to comply with safe drinking water standards and requirements.

   c. Projects that propose development of new sources of potable water serving or proposed to serve a public water system must comply with the terms of HAR 11-20-29. This section requires that all new public water system sources be approved by the Director of Health prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report, which addresses the requirements set in HAR Section 11-20-29, entitled "Use of new sources of raw water for public water systems."

   d. The engineering report must identify all potential sources of contamination and evaluate alternative control measures, which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the State Laboratories Division of the state of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.

e. All public water system sources must undergo a source water assessment, which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the drinking water source.

f. All public water systems must be operated by certified distribution system and water treatment plant operators as defined by HAR Chapter 11-25, entitled "Rules Pertaining to Certification of Public Water System Operators."

g. For further information concerning the application of capacity, new source approval, operator certification, source water assessment, backflow/cross-connection prevention or other regulated public water system programs, please contact the Safe Drinking Water Branch Engineering Section at (808)586-4258.

If there are any questions, please call Jennifer Nikaido at (808)586-4258.

Sincerely,

STUART YAMADA, P.E., CHIEF
Safe Drinking Water Branch
Environmental Management Division

JN:cb

c: Wil Chee - Planning & Environmental
Attention: Celia Shen
1018 Palm Drive
Honolulu, Hawaii 96814

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Stuart Yamada, P.E.
Branch Chief
Dept. of Health, Safe Drinking Water Branch
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Yamada,

We have received your letter dated September 30, 2010 concerning the above referenced Revised Draft EA. Thank you for providing information on the applicable requirements and regulations pertaining to the use of a dual water system.

It is the intention of Connections Charter School to develop a sustainable campus, thus the use of rainwater and recycled water would be utilized to the maximum extent possible, not only to reduce their demand on the municipal potable water supply, but to demonstrate their commitment to sustainability. Development of a potable water well would be an option of last resort. We acknowledge your comment that if a well is developed for potable water, it would be categorized as a public water system. As a public water system, it would be subject to compliance with HAR 11-20 "Rules Relating to Potable Water Systems," which includes the demonstrated ability to meet minimum capacity requirements, approval by the Director of Health of the public water system source(s), submission of a satisfactory engineering report, and a source water assessment. We further note that the public water system must be operated by a certified distribution system and water treatment plant operator as defined in HAR 11-25 "Rules Pertaining to Certification of Public Water System Operators." An expanded discussion related to the project's water supply, including requirements related to potable well development, is included in the Final EA.

Again, thank you for providing the applicable regulatory information to us and thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

LINDA LINGLE
GOVERNOR

KATHRYN S. MATAYOSHI
INTERIM SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

August 30, 2010

Mr. John L. Thatcher II, CEO
Connections Public Charter School
174 Kamehameha Avenue
Hilo, Hawai`i 96720

Dear Mr. Thatcher:

Subject: Revised Draft Environmental Assessment for the
Connections Public Charter School Campus

The Department of Education has reviewed the Revised Draft Environment Assessment for the proposed new campus for the Connections Public Charter School. We have no comment or concern about the school's new campus.

If you have any questions, please call Heidi Meeker of the Facilities Development Branch at (808) 377-8301.

Sincerely yours,

Duane Y. Kashiwai
Public Works Administrator
Facilities Development Branch

DYK:jmb

c: ✓Celia Shen, Wil Chee – Planning & Environmental

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Duane Y. Kashiwai
Public Works Administrator
State of Hawai'i, Dept. of Education
P.O. Box 2360
Honolulu, Hawai'i 96804

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Kashiwai,

We have received your letter dated August 30, 2010 informing us that you have no comments or concerns regarding the project.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

William P. Kenoi
Mayor

BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

County of Hawai'i
PLANNING DEPARTMENT
Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawai'i 96720
Phone (808) 961-8288 • Fax (808) 961-8742

September 16, 2010

Mr. John L. Thatcher II, CEO
Connections Public Charter School
174 Kamehameha Avenue
Hilo, Hawai'i 96720

Dear Mr. Thatcher:

SUBJECT: Comments on Revised Draft Environmental Assessment
Project: Connections Public Charter School Master Plan
TMK: (3) 2-5-006:141; Ponahawai and Kūkūau 2nd, South Hilo, Hawai'i

This letter is prepared in response to correspondence dated August 17, 2010, providing this office with a copy of a Revised Draft Environmental Assessment (DEA) prepared pursuant to Hawai'i Revised Statutes, Chapter 343 and Administrative Rules, Title 11, Chapter 200.

The Connections Public Charter School is proposing to open a new campus to consolidate the existing academic programs at a single location, plus provide land area and facilities to expand their academic offerings. Facilities included would accommodate the pre-k, elementary, intermediate, and high school programs and supporting services, an agricultural program, and a small dormitory facility. Connections is pursuing a long-term land lease agreement with the current property owner, the State of Hawai'i.

The subject property is zoned A-1a (Agricultural-minimum 1 acre lot size) and is situated within the State Land Use Agricultural District. In addition, according to the County of Hawai'i General Plan 2005 (amended December 2006), the subject property is designated as Low Density Urban by the Land Use Pattern Allocation Guide. The parcel is not located in the Special Management Area.

The Revised DEA for Connections Public Charter School Master Plan has been reviewed by this office and we offer the following comments:

1. *Section 1.5 Project Profile* incorrectly states that the County of Hawai'i General Plan LUPAG designation for the subject parcel is Urban Expansion. Please note that the correct designation is Low Density Urban, which allows for residential, with ancillary community and public uses, and neighborhood and convenience-type commercial uses; overall residential density may be up to six units per acre.
2. *Section 4.3 Hawai'i State Plan* references the wrong citation for the Hawai'i Revised Statute (HRS) pertaining to the Hawai'i State Plan. The correct chapter is HRS Chapter 226.

We have no further comments to offer, at this time. If you have any questions or if you need any assistance, please feel free to contact Bethany Morrison of this office at 961-8138.

Sincerely,

BJ LEITHEAD TODD
Planning Director

BJM:cs
P:\wpwin60\Bethany\EA-EIS Review\reviseddrafteaConnections.doc

cc: Ms. Celia Shen
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

B.J. Leithead Todd
Planning Director
County of Hawai'i, Planning Department
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Ms. Leithead Todd,

We have received your comments dated September 16, 2010 concerning the above referenced Revised Draft EA. We note that the County of Hawai'i General Plan LUPAG designation for the subject parcel is Low Density Urban and not Urban Expansion as stated in Section 1.5 of the EA. This designation is corrected in the Final EA. We also note that the EA references an incorrect chapter of the HRS relating to the Hawai'i State Plan. This too is corrected in the Final EA.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

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

September 21, 2010

Mr. John L. Thatcher, CEO
Connections Public Charter School
174 Kamehameha Avenue
Hilo, HI 96720

***REVISED* DRAFT ENVIRONMENTAL ASSESSMENT**
CONNECTIONS PUBLIC CHARTER SCHOOL MASTER PLAN
TAX MAP KEY 2-5-006:141

We have reviewed the subject Revised Draft Environmental Assessment (RDEA) and have the following comments.

1. We can confirm that the current water availability conditions in the area, which are subject to change without notice, can provide up to seven (7) units of water per pre-existing lot of record. Each unit of water is limited to a maximum daily usage of 600 gallons; therefore, our existing water system can only provide a maximum of 4,200 gallons per day for the subject parcel.

2. As stated in the subject RDEA, the Department will require that water usage calculations be provided by a professional engineer, licensed in the State of Hawai'i, showing the estimated potable water demand for the project.

3. The Department has no objection to the proposed use of a private rainwater catchment system to supplement the water needs of the proposed project. However, the water system plumbing between the potable water system and proposed catchment water system shall not be interconnected.

4. A reduced pressure type backflow prevention assembly must be installed within five (5) feet of the meter serving the project. The installation of the backflow prevention assembly must be inspected and approved by our Department before water service can be activated.

5. As the Department's Water System Standards do not cover catchment water systems, plan review by our Department will be limited to the service lateral, water meter, and backflow prevention assembly installation only.

Should there be any questions, you may 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 - Ms. Celia Shen, Wil Chee Planning & Environmental

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Milton D. Pavao, P.E.
Manager
County of Hawai'i, Department of Water Supply
345 Kekūanaō'a Street, Suite 20
Hilo, Hawai'i 96720

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Pavao,

We have received your comments dated September 21, 2010 concerning the above referenced Revised Draft EA. We acknowledge your confirmation that the existing water system in the project area can only provide a maximum of 4,200 gallons per day to the subject parcel. We also acknowledge that the Department has no objection to the use of a private rainwater catchment system to supplement the project's water needs. Further, we note that the Department's Water System Standards do not cover catchment systems and that your plan review will be limited to the service lateral, water meter, and backflow prevention assembly installation.

Lastly, we reaffirm the statement made in the Revised Draft EA that water usage calculations that estimate the project's potable water demand will be provided to the Department.

Thank you for providing this information and for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

William P. Kenoi
Mayor

William T. Takaba
Managing Director

Ivan M. Torigoe
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

August 30, 2010

Wil Chee – Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814
Attention: Celia Shen or Richard McGerrow

Connections Public Charter School
174 Kamehameha Avenue
Hilo, HI 96720
Attention: John L. Thatcher, II, CEO

RE: Revised Draft Environmental Assessment
Connections Public Charter School Master Plan
TMK: 2-5-006:141

We have no comments to offer on this project.

Thank you for allowing us to review and comment on this project.

Sincerely,

Ivan M. Torigoe
DEPUTY DIRECTOR

12692R

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Ivan M. Torigoe
Deputy Director
County of Hawai'i, Dept. of Environmental Management
25 Aupuni Street
Hilo, Hawai'i 96720

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Mr. Torigoe,

We have received your letter dated August 30, 2010 informing us that you have no comments on this project.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Providing Services Since 1976
Land Use Planners and Environmental Consultants
1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

William P. Kenoi
Mayor

Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Suite 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

August 30, 2010

Attention: Celia Shen
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, Hawai'i 96814

Dear Ms. Shen,

SUBJECT: REVISED DRAFT ENVIRONMENTAL ASSESSMENT
CONNECTIONS NEW CENTURY PUBLIC CHARTER SCHOOL MASTER PLAN

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced draft Environmental Assessment.

Thank you for the opportunity to comment.

Sincerely,

DARRYL OLIVEIRA
Fire Chief

GA:lk

CC: Connections Public Charter School, John Thatcher II

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Chief Darryl Oliveira
County of Hawai'i Fire Department
25 Aupuni Street, Suite 2501
Hilo, Hawai'i 96720

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Chief Oliveira,

We have received your letter dated August 30, 2010 informing us that you have no comments on the project at this time.

Thank you for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Sept. 14, 2010

To: Wil Chee – Planning and Environmental
Attn: Celia Shen or Richard Stook
1018 Palm Drive
Honolulu, Hawaii 96814

From: Fred D. Stone, Ph.D.
P.O. Box 1430
Kurtistown, HI 96760
Tel: 808-966-7361

Dear Mr. Chee,

I have reviewed the amended draft EA for the proposed Connections Charter School. I am pleased that you have included my comments and materials in the current draft EA. I believe the plan to move the school to the lower parcel is an acceptable solution. However, I am strongly opposed to alternatives 1, 2 and 3, in which buildings are placed over or directly adjacent to Kaumana Cave on the upper property. These should not be presented as acceptable alternatives.

I do have a concern about the proposed nature trail boardwalk on the upper parcel. The idea of the nature trail is excellent, but it should not be necessary to remove 'ohi'a trees in order to build the trail. I have walked on many such boardwalks in other places, and the more common solution is to either make the trail zig-zag around the tree, or make a puka in the trail surrounding the tree. This integrates the natural feature as part of the experience of walking the trail.

I suggest that the plan to outplant native plants be extended to landscaping for the lower parcel.

The idea of making Kaumana Cave part of the educational experience is also excellent, and I am willing to volunteer to help the Connections Charter School develop a sound plan to make this part of their curriculum.

Sincerely,

Fred D. Stone

Cc.
John Thatcher, Coordinator
Connections Public Charter School
174 Kamehameha Ave
Hilo, Hawaii 96720
Laura Thielen
Office of the Chairperson
1151 Punchbowl St.
Room 110
Honolulu, HI 96813

WIL CHEE – PLANNING & ENVIRONMENTAL

October 15, 2010

Fred D. Stone, Ph.D.
P.O. Box 1430
Kurtistown, Hawai'i 96760

Subject: **Revised Draft Environmental Assessment for the Connections Public Charter School Master Plan, TMK (3) 2-5-006:141**

Dear Dr. Stone,

We have received your comment letter dated September 14, 2010 concerning the above referenced Revised Draft EA. We are pleased that you find the reconfigured campus plan acceptable.

Your opposition to the presentation of alternatives 1, 2 and 3 in the EA as acceptable alternatives is noted. While these alternatives could be less preferable from an environmental standpoint, we believe that they could potentially be feasible and will remain in the EA as alternatives considered. Further, we believe that inclusion of these alternatives documents the evaluation and decision-making process undertaken to identify and develop the most environmentally preferred alternative—the Proposed Action, particularly in light of the new information that was brought to our attention later in the planning process.

In constructing the elevated walkway on the upper parcel, it is the intent to leave as many of the ʻōhiʻa trees in place as possible. However, it cannot be guaranteed that no trees would be removed. Topographical limitations and the need to meet ADA requirements may preclude the desire to leave all ohia trees intact. Be assured that every attempt would be made to minimize any removal of ʻōhiʻa trees when laying out the alignment and constructing the elevated walkway. As well, opportunities to outplant native species within the lower parcel's landscaping will be identified and implemented wherever possible.

Lastly, we appreciate your generous offer to assist Connections Charter School with incorporating management and protection of Kaumana Cave into their educational curriculum. We will keep this in mind as we move forward with the project.

Thank you for your input and for participating in the environmental review process.

Sincerely,

Celia Shen
Planner

cc. John Thatcher II, CEO Connections Public Charter School

Appendix D
Biological Report

Biological surveys for the Kaūmana Charter School Parcel, Hilo, Hawai'ì

February 23, 2009

E. Guinther, S. Montgomery[1], and R. David[2]
AECOS Consultants
45-309 Akimala Pl.
Kāne'ohe, Hawai'i 96744

INTRODUCTION

This report summarizes the findings of the botanical, invertebrate, avian and mammalian surveys conducted within the proposed project property. The primary purpose of the surveys was to determine if there were any botanical, invertebrate, avian or mammalian species currently listed as endangered, threatened, or proposed for listing under either the federal or the State of Hawai'i's endangered species programs on, or within in the immediate vicinity of the site. We were also asked to evaluate the potential impacts that the development of the Kaūmana School campus might pose to any sensitive or protected native botanical, invertebrate, avian or mammalian species, and to propose appropriate minimization and or mitigative measures that could be implemented to reduce or eliminate any such impacts. Federal and State of Hawai'i listed species status follows species identified in the following referenced documents (Division of Land and Natural Resources (DLNR) 1998, Federal Register 2005, U. S. Fish & Wildlife Service (USFWS) 2005, 2008a). Fieldwork was conducted in December 2008.

The subject parcel is actually two parcels divided by Edita Road (Fig. 1). Most or all of the property lies between the 920 m and 600 m elevation, on a Mauna Loa *pahoehoe* lava flow dated 1881. Consequently, the long term history of disturbances to the natural environment begins in 1881 when lava destroyed a relatively narrow swath (varies, but on the order of 500 m or 1600 ft) of native forest, and does not include clearing for agricultural uses as typifies surrounding lands. Soils on the relatively recent lava flow are too thin to support pasturing of animals or sugar cane cultivation.

[1] Montane Matters, Waipahu
[2] Rana Productions Ltd., Kailua-Kona

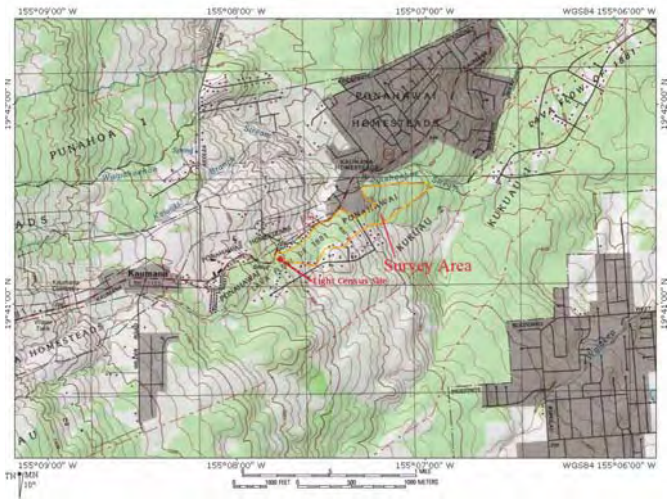

Figure 1. Kaūmana Charter School property and survey location (outlined in orange).

METHODS

Place names follow *Place Names of Hawaii* (Pukui et al. 1974). Although the team spent one day together on site, each member followed up with additional survey effort as appropriate to complete the individual responsibilities.

Botanical Survey Methods

The botanical survey was undertaken on December 10-11, 2008 by Eric Guinther. The survey methodology utilized a wandering transect, whereby the botanist walked around the property visiting representative areas of the vegetation, and noting the occurrence of all species of ferns and flowering plants encountered. Relative abundance (for this location) of each species was recorded. This method (as opposed to say, utilizing fixed transects) provides better cover and likelihood of recording uncommon and rare species, but is less precise with respect to actual abundance of each species. Species requiring additional identification were photographed and specimens taken for workup in the laboratory.

Conditions during the survey were ideal. Although the site is located in a wet area and the survey undertaken during the wet season, the weather was generally sunny and mild. Plant names follow *Hawai'i's Ferns and Fern Allies* (Palmer, 2003) for ferns, *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1990, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for crop and ornamental plants.

Invertebrate Survey Methods

Invertebrates are certainly the numerically dominant fauna in natural Hawaiian environments. The primary emphasis of this survey conducted by Dr. Steven Montgomery was on terrestrial invertebrates, particularly those that are endemic, indigenous, or listed species (having legal status under either, or both federal and state endangered species statutes [DLNR. 1996, 1997; USFWS, 2005a, 2006]).

Field surveys were conducted November 2008-January 2009 at the Kaūmana site. A general assessment of the terrain and habitats was conducted at the start of the survey. Surveying efforts were conducted at various times of day and night, a technique which is vital for a thorough survey of invertebrates, many of which are crepuscular or nocturnal. The native floral resources were an important focus of searches for native insects.

Dr. Montgomery has taken part in field projects at other locations in similar environments on Hawai'i and throughout the island chain since 1969. Those

experiences and the results of those surveys provide the basis for the study design and analysis of results used here. The following survey methods for terrestrial invertebrates were used as appropriate to the terrain, botanical resources, and target species. Species names follow Hawaii Biological Survey (2002), Nishida (2002), Zimmerman (1948-80), and Zimmerman (2001).

Invertebrates fieldwork schedule

Nov 7, 2008	Site examination, general orientation; day survey
Dec 10-11, 2008	Day survey
Jan 18, 2009	Day survey; night survey with light

Host plant searches — Potential host plants, both native and introduced, were searched for arthropods that feed or rest on plants. The Kaūmana School property was traversed in a wandering manner, crisscrossing areas to access potential host plants.

Figure 2. Light attracts arthropods

Light survey — A survey of insects active at night is vital to a complete record of the arthropod fauna. Many insects are only active at night to evade birds, avoid desiccation and high temperatures, or to use night food sources, such as night blooming flowers. Light sampling uses a bright light source in front of a white cloth sheet (Figure 3). Nocturnal insects seem to mistake the collecting light for the light of the moon, which they use to orient themselves. In attempting to navigate by the scientist's light, confused insects are drawn around the light and land on the cloth in confusion. This type of survey is most successful during the dark phase of the moon or under clouds blocking starlight. Vegetation usually blocks light from being seen over long distances, and most moths and other night fliers are not capable of very distant flight. Consequently, light surveying does not call in many insects from outside the survey area.

The monitoring location was chosen based on experience, host plant proximity, and terrain (Figure 1). The light source was an ultra violet (UV) or black light bulb, a light wave length known to be attractive to night active insects. Light surveying began on Jan 18, 2009, at dark (approximately 6:30 p.m.) and was conducted throughout the night. Although the moon was a waning crescent with 42% of the visible disk illuminated, it did not rise until 1:41 a.m. on Jan 19, 2009, leaving many moon-free hours for monitoring (USNO). Additionally, some arthropods were attracted to the light even after moon-rise.

Sweep nets — This method assists in surveying many flying and perching insects. A fine mesh net is swept across plants, leaf litter, rocks, etc. to census any flying, perching or crawling insects.

Visual observation — vigilance is maintained for visual or aural evidence of arthropods. Visual observations provide valuable information and are a cross check that extends the reach of survey techniques. Visual observation also includes turning over rocks, dead wood, and other debris.

Survey limitations/conditions — The survey schedule and duration were adequate to assess potential impacts of the proposed project on invertebrate resources. The survey was representative and targeted to locate and examine host plants which might be utilized by native invertebrates. Nevertheless, my ability to form advisory opinions regarding the invertebrates present is limited by several factors.

1. **Common alien species**: No attempt was made to document the many common alien arthropod species present in the area. With introduced plants dominating much of the property, the number of alien invertebrates encountered was high.

2. **Physical limitations**: The size of the project area allowed a fairly comprehensive survey. *Uluhe* fern mats made chasing arthropods in flight difficult. Nevertheless, in most situations, it was possible to obtain access to host plants of interest. The light survey compensated well for some reduced access.

3. **Survey conditions**: Monitoring at a different time of the year, or for a longer period of time, might produce a longer or different arthropod list. Weather and seasonal vegetation play an especially important role in any survey of invertebrates. Many arthropods habitually emerge and breed to overlap or follow seasonal weather or to coincide with growth spurts or fruiting of an important plant food. The absence of host plants, however, was a stronger factor affecting the invertebrate species noted than seasonal changes, weather, or other causes.

Weather was favorable for surveying during each day of fieldwork. This study was conducted during the winter season, ensuring that the few native host plants were in a stage adequate for surveying. As the survey was conducted over several months, varying conditions were encountered. Thanks are extended to Roland Reeve for arranging first transects, and to Eric Guinther for maps and assistance with access to the site. Anita Manning contributed to preparation of this report. Steven Lee Montgomery conducted all surveying and is responsible for all conclusions.

Avian Survey Methods

Eight bird count stations were sited along a linear transect running the length of the property. Count stations were placed at approximately 200-meter intervals equally spaced along the transect. Eight-minute point counts were made at each of the eight count stations. Each station was counted once. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated in the early morning hours, traditionally the peak of daily bird activity. Time not spent counting was used to search the remainder of the project site for species and habitats that were not detected during count sessions.

The avian phylogenetic order and nomenclature used in this report follows *The American Ornithologists' Union Checklist of North American Birds 7th Edition* (American Ornithologists' Union, 1998), and the 42nd through the 49th supplements to *Check-list of North American Birds* (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008).

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *'ōpe'ape'a* as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species. Most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed, heard or detected by other means within the project area. Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986).

RESULTS

Botanical Survey Results

The results of the botanical survey include a listing of the plants encountered (the flora) and a description of the vegetation. Scientific and common names of the plants observed on the project site are given in Table 1, grouped by higher taxa. The total number of vascular plants (ferns, fern allies, conifers, and flowering plants) encountered was 65. The "Status" column indicates whether a species is non-native ("nat" for naturalized) or native ("ind" for indigenous and "end" for endemic; see notes at end of Table 1). Of the 65 species identified on the Kaūmana Charter School property, 11 are native (indigenous or endemic) to the Hawaiian Islands. The total number of species is not very high considering the size of the parcels, however, the nature of the assemblage (that is, mostly undisturbed and dominated by a few native species) accounts for this result. Abundance estimates in the listing are averaged approximations for the project area.

Table 1. Flora listing for the Kaūmana Charter School Parcel, December 2008.

Species listed by family	*Common name*	*Status*	*Abundance*	*Notes*
FERNS and FERN ALLIES				
GLEICHENIACEAE				
Dicranopteris linearis (Burm. f.) Underw.	*uluhe*	**Ind**	AA	
LYCOPODIACEAE				
Lycopodiella cernua (L.) Pic. Serm.	*wāwae'iole*	**Ind**	U	
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F.M. Jarrette ex C. V. Morton	---	Nat	O3	
POLYPODIACEAE				
Lepisorus thunbergianus (Kaulf.) Ching	*pākahakaha*	**Ind**	R	
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	R1	
PSILOTACEAE				
Psilotum nudum (L.) P. Beauv.	*moa*	**Ind**	U	
PTERIDACEAE				
Pityrogramma calomelanos (L.) Link	silver fern	Nat	R	(1)
FLOWERING PLANTS				
Dicotyledons				
ACANTHACEAE				
unidentified, ?*Asystasia* sp.		Nat	R	

Table 1 (continued).

Species listed by family	*Common name*	*Status*	*Abundance*	*Notes*
ANACARDIACEAE				
Rhus sandwicensis A. Gray	*neleau*	**End**	U	
APIACEAE				
Centella asiatica (L.) Urb.	Asiatic pennywort	Nat	R	
APOCYNACEAE				
Allamanda cathartica L.	allamanda	Orn	O	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	R	
Conyza sp.	horseweed	Nat	R	(1,2)
Crassocephalum crepidioides (Benth.) S. Moore	---	Nat	R	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	R	(1)
Erichtites valerianifolia (Wolf) DC	fireweed	Nat	R	
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat	U	(1)
Sphagneticola trilobata (L.) Pruski	wedelia	Nat	R2	(1)
BUDDLEJACEAE				
Buddleja asiatica Lour.	dog tail	Nat	R	(1)
CLUSIACEAE				
Clusia rosea Jacq.	autograph tree	Nat	U	
ERICACEAE				
Leptecophylla tameiamaeia (Cham. & Schlechtend.) Weiller	pūkiawe	**Ind**	R1	
FABACEAE				
Acaia koa	*koa*	**End**	R	
Chamaecrista nictitans (L.) Moench	partridge pea	Nat	R	
Crotalaria pallida Aiton	smooth rattlepod	Nat	U	(1)
Desmodium incanum DC	Spanish clover	Nat	U	
Desmodium triflorum (L.) DC	---	Nat	R	(1)
Falcataria moluccana (Miq.) Barneby & Grimes	albizia (juv)	Nat	U	
Mimosa pudica L.	sensitive plant	Nat	R	(1)
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat	U	(1)
MALVACEAE				
Hibiscus rosa-sinensis L.	Chinese hibiscus	Orn	R	
MELASTOMATACEAE				
Arthrostemma ciliatum Pav. ex D. Don	---	Nat	U	(1)
Clidemia hirta (L.) D. Don	Koster's curse	Nat	U	
Heterocentron subtriplinervium (Link & Otto) A. Braun & C. Bouché	---	Nat	R	
Melastomia candidum D. Don	---	Nat	C	

Table 1 (continued).

Species listed by family	*Common name*	*Status*	*Abundance*	*Notes*
MELASTOMATACEAE (continued)				
Tibouchina herbacea (DC) Cogn.	---	Nat	R	(1)
MYRSINACEAE				
Ardisia elliptica Thunb.	shoebutton ardisia	Nat	O	
MYRTACEAE				
Eucalyptus robusta Sm.	swamp mahogany	Nat	R	
Metrosideros polymorpha Gaud.	*'ōhi'a*	**End**	A	
Psidium cattleianum Sabine	strawberry guava	Nat	C	
Syzygium jambos (L.) Alston	rose apple	Nat	R2	
POLYGALACEAE				
Polygala paniculata L.	---	Nat	U	
RUBIACEAE				
Spermacoce assurgens Ruiz & Pav.	buttonweed	Nat	U	
STERCULIACEAE				
Melochia umbellata (Houtt.) Stapf	---	Nat	O	
ULMACEAE				
Trema orientalis (L.) Blume	gunpowder tree	Nat	R	
VERBENACEAE				
Stachytarpheta australis Moldenke	---	Nat	R	(1)
FLOWERING PLANTS				
Monocotyledons				
AGAVACEAE				
Cordyline fruticosa (L.) A. Chev..	ti, *ki*	Pol	U	
Dracaena fragrans (L.) Ker-Gawl.	fragrant dracaena	Orn	R1	
ARACEAE				
Anthurium x *ferrierense* Masters & Moore	anthurium	Orn	R	
ARECACEAE				
Archontophoenix alaxandrae (F. v. Mueller) Wendl. & Drude	Alexandria palm	Nat	R	
Philodendron cf. *scandens* Koch & Sello	heart-leaf philodendron	Orn	R2	
CYPERACEAE				
Cyperus halpan L.	sharp-edge sedge	Nat		
Cyperus polystachyos	---	**Ind**	U	(1)
Fimbristylis dichotoma (L.) Vahl	---	**Ind**	R	(1)
Machaerina mariscoides (Gaud.) J. Kern	*'ahanui*	**Ind**	C	
Rhynchospora caduca Elliott	anglestem beakrush	Nat.	O	(1)
ORCHIDACEAE				
Arundina graminifolia (D. Don) Hochr.	bamboo orchid	Nat	O	
Phaius tankarvilleae (Banks ex L'Her) Bl.	Chinese ground orchid	Nat	R	

Table 1 (continued).

Species listed by family	*Common name*	*Status*	*Abundance*	*Notes*
ORCHIDACEAE (continued)				
unidentified	orchid	Orn	R	(2)
POACEAE				
Andropogon virginicus L.	broomsedge	Nat	C	
Digitaria sp.	---	Nat	R	
Melinus minutiflora P. Beauv.	molasses grass	Nat	O2	(1)
Paspalum cf. dilatatum Poir.	Dallis grass	Nat	R	
Pennisetum purpureum Schumach.	elephant grass	Nat	U2	
Sacciolepis indica (L.) Chase	Glenwood grass	Nat	O	
Schizostachyum glaucifoilium (Rupr.) Munro	*'ohe*	Pol	R	
ZINGIBERACEAE				
Hedychium flavescens N. Carey ex Roscoe	yellow ginger	Nat	U	

Legend to Table 1.

STATUS = distributional status for the Hawaiian Islands:
- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- orn. = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
- **pol.** = Polynesian introduction before 1778.

ABUNDANCE = occurrence ratings for plants by area:
- R – Rare — seen in only one or perhaps two locations.
- U - Uncommon- — seen at most in several locations
- O - Occasional — seen with some regularity
- C - Common — observed numerous times during the survey
- A - Abundant — found in large numbers; may be locally dominant.
- AA - Very abundant — abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area. The ratings above provide an estimate of the likelihood of encountering a species within the survey area; numbers modify this if abundance, where encountered, tends to be greater than the occurrence rating:
- 1 – several plants present
- 2 - many plants present
- 3 – abundant over a localized area

NOTES:
- (1) – Species mostly or entirely associated with recently disturbed areas on the property.
- (2) – Observed plant lacking fruit or flowers.

A common lichen in the survey area is British soldier lichen (*Cladonia* sp.). At least two species of mosses (unidentified) are present as well.

Vegetation — All or nearly all of the property is located on the Mauna Loa lava flow of 1881. Thus, we know the vegetation at this site "started over" as it were after 1881. The site has been disturbed more recently, but the majority of the land remains undisturbed and the vegetation reflects the largely native plant community that developed after 1881,

gradually reclaiming the bare lava flow. In the 128 intervening years, a native forest dominated by *ʻōhiʻa* (*Metrosideros polymorpha*) trees with a dense understory of *uluhe* (*Dicranopteris linearis*) fern came to be established here; this is a Lowland Wet Forest (Gagne and Cuddihy, 1990) of type termed: *ʻŌhiʻa/Uluhe* (*Metroisideros/Dicranopteris*). The dense *uluhe* fern is effective at keeping most other species out and the density of the *ʻōhiʻa* trees varies considerably from place to place, but typically approaches a closed canopy where undisturbed. Soils are thin on the recent *pahoehoe* lava flow (Sato, et al., 1973).

As the surrounding properties came to be developed and the saddle road built, opportunities opened for non-native species to invade the native plant community. This process has been slow, but has been accelerated where the native community is disturbed, either by clearing, grubbing, or, in the case of Road, cutting the property into two parcels with complete removal of a swath of the native plants.

It is interesting to note that during the plant survey, the southern end of the parcel was reached after a relatively long, meandering trek down slope. Lacking knowledge of exact location, a point was reached where there was seen to be a dramatic shift in the nature of the vegetation, with many species appearing that had not been previously recorded (the property was initially surveyed from southwest to northeast). A forest dominated by strawberry guava (*Psidium cattleianum*) and an absence of *ʻōhiʻa* and *uluhe* was entered, and many other non-native species were being recorded, including large albizia (*Falcateria moluccana*) trees. Finally, the transect reached the dry streambed of Waipahoehoe Stream and it then became evident that the survey track had left the the 1881 lava flow and the eastern end of the Kaūmana Charter School property. The species recorded in this area are not included in our report, but suffice it to say, the difference in vegetation between that associated with the 1881 lava flow, and that not on the lava flow is striking. At least two important factors are operating here: deeper soils and (as a consequence) a past history of agricultural land use after clearing of the native forest.

Invertebrate Survey Results

Native Hawaiian plant, vertebrate, and invertebrate populations are often interdependent. Certain insects are obligatorily attached to specific host plants, using only that plant as their food. These insect relationships with hosts are ancient and often intertwined. The health of native Hawaiian invertebrate populations depends upon habitat quality and absence or low levels of predators introduced from the continents. Sufficient food sources, host plant availability, and the absence or low levels of introduced, continental predators and parasites comprise a classic native, healthy ecosystem. Consequently, where appropriate in the survey discussion, host plants and some introduced arthropods are also noted.

The results of day and night invertebrate surveys are presented in Table 2. Native species observed on the property are discussed below and information is provided on several alien species frequently observed by the public that may be misidentified or confused with native species. Alien species that affect the survival of native species and species that impact human health also are discussed.

Table 2. List of Invertebrates, Kaūmana Charter School Property, Hilo, Hawai'i.

Species	Common name	Status	General abund.	Site of recovery
ARTHROPODA				
INSECTA				
COLLEMBOLA				
Entomobryidae				
Salina celebensis (Schaeffer, 1898)	leaf springtail	Adv	C	on leaves
DIPTERA	flies and mosquitoes			
Culicidae	mosquito			
Aedes albopictus (Skuse, 1894)		Adv	C	throughout
Culex quinquefasciatus Say, 1823		Adv	C	throughout
Ceratopogonidae	midge			
Forcipomyia hardyi Wirth & Howarth, 1982		End	C	throughout
Tipulidae	crane fly			
Limonia perkinsi (Grimshaw, 1901)		Adv	A	light
HOMOPTERA				
Psyllidae	jumping plant lice			
Trioza ohiacola Crawford, 1918		End	C	light, on leaves
HYMENOPTERA	wasps, bees, ants			
Apidae				
Apis mellifera Linnaeus, 1758	honey bee	Pur	O	in flight
Formicidae	ants			
Anoplolepis gracilipes	long-legged ant	Adv	U	on soil
Camponotus variegatus (F. Smith, 1858)	carpenter ant	Adv	U	at light
Pheidole megacephala	big-headed ant	Adv	C	on soil

Table 2 (continued).

Species	Common name	Status	General abund.	Site of recovery
Vespidae	wasps			
Polistes exclamans Viereck, 1906	common paper wasp	Adv	U	
LEPIDOPTERA				
Cosmopterigidae	case bearers			
Hyposmocoma sp.	broad case	End	R	on stones
Crambidae	micro-moths			
Eudonia sp.	moss moth	End	R	
Noctuidae	miller moths			
Ascalapha odorata (Linnaeus, 1758)	black witch moth	Adv	U	on host plant
Schrankia altivolans (Butler)		End	R	on ohia root
Nymphalidae				
Agraulis vanillae (Linnaeus, 1758)	passion vine butterfly	Adv	R	in flight
Sphingidae	hawk moths			
Agrius cingulata (Fabricius, 1775)	sweetpotato hornworm	Adv	R	on host plant
ODONATA	dragonflies and damselflies			
Aeshnidae				
Anax junius (Drury, 1770)	common green darner	Adv	R	in flight
Libellulidae	skimmers			
Pantala flavescens (Fabricius, 1798)	globe skimmer	Ind	R	in flight
ORTHOPTERA	praying mantis, grasshoppers, crickets, katydids			
Gryllidae				
Trigonidium sp.	cricket	End	R	green nymph on ferns
Tettigoniidae				
Euconocephalus nasutus (Thunberg), 1815	aggravating grasshopper	Adv		vocal

Status:
- End endemic to Hawaiian Islands
- Ind indigenous to Hawaiian Islands
- Adv adventive
- Pur purposefully introduced
- ? unknown

Table 2 (continued).

Abundance = occurrence ratings:
- R Rare: seen in only one or perhaps two locations
- U Uncommon: seen at most in several locations
- O Occasional: seen with some regularity
- C Common: observed numerous times during the survey
- A Abundant: found in large numbers
- AA Very abundant: abundant and dominant

Native Arthropods

INSECTA: LEPIDOPTERA

Cosmopterigidae: *Hyposmocoma*

One species of *Hyposmocoma*, as caterpillars, was found on the rocky surfaces. Properly called "case bearers," the caterpillars are sometimes misleadingly called "bagworms." Very young caterpillars of case bearers find safety in a hiding place like a leaf curl. When growth forces them out of that protection, they intricately weave a portable shell of their own silk from a lip spinneret. For camouflage, they add bits of their surroundings to the case using their silk: snips of dry grass or leaves, flakes of bark, maybe a little soil. The case is then easily mistaken by a predator as another part of the landscape. These bunkers are fitted with a hinged lid (operculum), pulled shut by mini-mandibles to defend them from enemies like beetles and micro wasps. Their relationship to the case is similar to that of a hermit crab to his shell. Although not physically connected to the case as a snail or turtle, they are dependent on it, and die if removed—even if protected from predators and given food. They don't move far, but feed while partly emerged from the case, dragging along their protective armor by their six true legs. (Manning/Montgomery in Liittschwager & Middleton 2001) With over 500 kinds, *Hyposmocoma* micromoths are the greatest assemblage of Hawaiian Island moths, showing astonishing diversity. After writing 630 pages on them, Dr. Elwood Zimmerman lamented the inadequacy of his study. He noted an enormous cluster of species with explosive speciation and diverging radiation (Zimmerman 1978). Much remains to be learned about the life ways of this interesting group of insects now under study by University of Hawaii's Dr. Daniel Rubinoff and colleagues (Rubinoff et al. 2008).

Crambidae: *Eudonia* sp.

This endemic, narrow winged, speckled moth is represented by more than 30 species known from Hawai'i Island of the 60 species in the island chain. One specimen came to the night light during the survey. A typical *Eudonia* feeds on mosses.

Noctuidae: *Schrankia altivolans*
The small native moth, *Schrankia altivolans*, is wide-spread throughout the Hawaiian Islands. The caterpillar of this endemic moth feeds on *'ōhi'a* aerial rootlets. The cocoon is protected by camouflage created with bits of root (Fig. 3).

Figure 3 (right). *Schrankia* habitat with inset showing cocoon (in front of shadow).

Libellulidae: *Pantala flavescens* Globe skimmer
The indigenous dragonfly *Pantala flavescens* (Fig. 4) is among the most easily observed of the native insects. They are large, easily approached by people, and graceful in flight. Any small amount of fresh water will attract them and they often colonize human maintained water sources such as golf course water hazards or home fish ponds. The adults lay eggs in the water where they develop into young called naiads. Mosquito larvae are among the foods of the naiads. The proposed habitat change may reduce their

numbers, but they are likely to recolonize almost any water source. The native dragonflies are widely distributed throughout the Hawaiian Islands, from Kure to Hawai'i Island (HBS, 2002; Nishida, 2002).

Alien Species: Arthropods

INSECTA: LEPIDOPTERA
Noctuidae: *Ascalapha odorata* ~ Black witch moth
The black witch moth has been widely distributed in the island chain since the 1920s. The classic food plant of the caterpillars, monkeypod (*Samanea saman*), was noted in the area. Near homes the moth is seen resting under the eaves of roofs during the day. In rural areas it rests under foliage and against tree trunks. It is most frequently seen a dawn or dusk. When seen in flight in such low light, this large moth is occasionally mistaken for a bat.

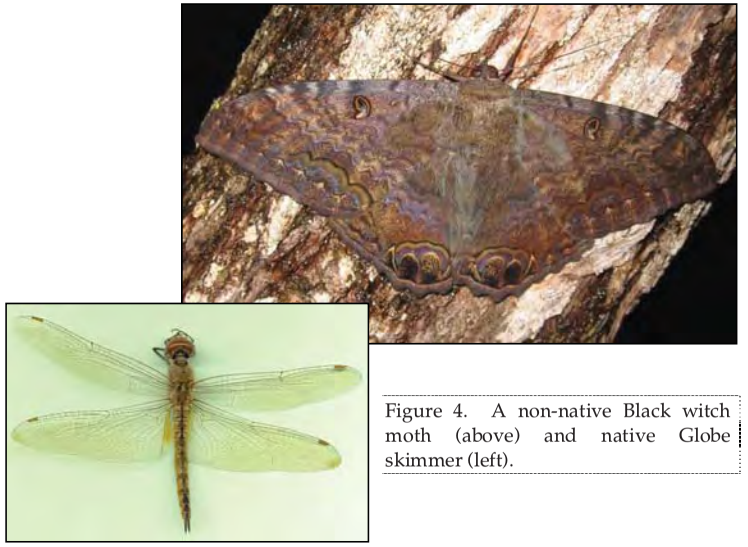

Figure 4. A non-native Black witch moth (above) and native Globe skimmer (left).

Nymphalidae: *Agraulis vanillae*
The passion vine butterfly (Fig. 5), with its bright orange wings, in quick flight might be mistaken by members of the public for the Kamehameha butterfly (*Vanessa tameamea*).

At rest, the silver markings on the underside of the wings easily distinguish it from the Kamehameha butterfly.

Figure 5 (left).

Sphingidae: *Agrius cingulata* ~ Sweet potato hornworm
This large and often seen moth is most easily confused by the public with the Blackburn's sphinx moth (*Manduca blackburni*) described below on page 22. The adult *A. cingulata* has pink markings (Fig. 6) along both sides, whereas *Manduca* has orange markings. When the moth is at rest with wings folded, these color markings are hidden. The caterpillars feed on sweet potato, morning glory, and related plants. The species is widely distributed around the Hawaiian Islands. (HBS 2002a, Nishida 2002).

Figure 6. Sweet potato hornworm (right) and Aggravating grasshopper (below).

ODONATA (Dragonflies and Damselflies)
Aeshnidae: *Anax junius* ~ Common green darner
The common green darner (*Anax junius* (Drury), 1770*)* also was seen. This non-native species is widely distributed, being known in North and South America, Europe and parts of Asia. It is sometimes confused with native species.

ORTHOPTERA (Praying Mantis, Grasshoppers, Crickets, Katydids)
Tettigoniidae: *Euconocephalus nasutus* ~ Aggravating grasshopper
The distinctive call of the aggravating grasshopper (Fig. 7, above), is heard at dusk and early dark. The sound, a bit like a transformer gone bad, is the call of the male. People often hear the sound, but cannot associate it with the creator.

Medically Important Arthropod Species

Invertebrate species likely to be found in the project area and having negative human health impacts include **centipedes,** and likely **brown widow spiders**. These species are often disturbed when dead brush or trash is cleared.

DIPTERA
Mosquitoes were observed during the survey and most likely breed where water is allowed to stand in discarded containers, and natural depressions. As winter rains intensify, mosquitoes will increase. In recent years, mosquito transmitted illnesses, such as dengue fever, have been a greater concern for the state's Department of Health. When work begins on the property and habitat is altered, the mosquito levels should abate.

HYMENOPTERA
The ants noted in the survey, long-legged ant (*Anoplolepis gracilipes*), carpenter ant (*Camponotus variegatus*) and the big-headed ant (*Pheidole megacephala*), are not known to bite or sting humans. Caution should be used, however, anywhere nests or large numbers of ants are found.

Honey bee (*Apis mellifera*) stings are known to cause **severe allergic reactions** in sensitive individuals. Unlike honey bees, wasps can sting repeatedly. Paper wasps (*Polistes exclamans*) were seen in several locations. Mud wasps were not seen, but they can be encountered anywhere in the islands. Not seeing them during the short term of this survey does not mean they are not on the property.

Avian Survey Results

Two hundred and fifteen individual birds of 14-different species, representing 13-separate families were recorded during station counts (Table 3). One additional species, Hawaiian Hawk (*Buteo solitarius*) was detected as an

incidental observation while transiting between count stations. Hawaiian Hawk is an endemic endangered species currently protected under both federal and state of Hawaii endangered species statutes. One species detected, Pacific Golden-Plover (*Pluvialis fulva*), is an indigenous migratory species. The remaining 14-species recorded are all considered to be alien to the Hawaiian Islands.

Avian diversity and densities were in keeping with the habitat present within the project area. Three species; Japanese White-eye (*Zosterops japonicus*), House Finch (*Carpodacus mexicanus*), and Nutmeg Mannikin (*Lonchura punctulata*), accounted for slightly more than 56% of the total number of all birds recorded during station counts. The most common avian species recorded was Japanese White-eye, which accounted for slightly more than 31.5% of the total number of individual birds recorded. An average of 27 individual birds were recorded per station count.

Table 3. Avian Species Detected, Kaūmana Charter School Site

Common Name	*Scientific Name*	*ST*	*RA*
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	D	1.50
	FALCONIFORMES		
	ACCIPITRIDAE - Hawks, Kites, Eagles & Allies		
	Accipitrinae - Kites, Eagles & Hawks		
Hawaiian Hawk	*Buteo solitarius*	**EE**	**I-1**
	CHARADRIIFORMES		
	CHARADRIIDAE - Lapwings & Plovers		
	Charadriinae - Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.13
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Rock Pigeon	*Columba livia*	A	0.63
Spotted Dove	*Streptopelia chinensis*	A	0.88
Zebra Dove	*Geopelia striata*	A	2.00

Table 3 (continued).

Common Name	*Scientific Name*	*ST*	*RA*
	PASSERIFORMES		
	SYLVIIDAE - Old World Warblers & Gnatcatchers		
	Sylviinae - Old World Warblers		
Japanese Bush-Warbler	*Cettia diphone*	A	0.25
	TIMALIIDAE - Babblers		
Hwamei	*Garrulax canorus*	A	0.25
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	8.50
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	1.50
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	0.88
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	3.50
	PASSERIDAE - Old World Sparrows		
House Sparrow	*Passer domesticus*	A	0.75
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Nutmeg Mannikin	*Lonchura punctulata*	A	3.13
Java Sparrow	*Padda oryzivora*	A	3.00

Key To Table 3

ST	Status
A	Alien Species
D	Domesticated species – not known to be established in the wild on Hawai'i
EE	Endangered Endemic Species – native and unique to the Island of Hawai'i and endangered
IM	Indigenous Migrant Species – native to Hawai'i but also found elsewhere naturally, migratory
RA	Relative Abundance - number of birds detected divided by the number of count stations (8)
I	Incidental observation – recorded while transiting the site, followed by the number seen

Mammalian Survey Results

One mammalian species was detected during the course of this survey. We encountered tracks, scat and sign of dog (*Canis f. familiaris*), and heard several dogs barking from within homelots adjacent to the subject property.

DISCUSSION

Botanical Resources

Other recent surveys of botanical resources on the 1881 lava flow in the Kaumana area include Gerrish (1995) and Palmer & Associates Consulting (1998). The Garrish survey encompassed that part of the 1881 flow in the Kaumana Homesteads between 1140 and 1500 ft (350 to 460 m). A total of 26 species were observed from a somewhat smaller area of the flow. The Palmer & Assoc. survey included only a very small part of the 1881 lava flow, around the 1500-ft (460-m) elevation. This flow was described as supporting a forest "in early successional stages with small, widely spaced trees…" The list of characteristic species, both native and non-native, agrees well with the results of our survey, with the exception that two native species, *'ama'u* (*Sadleria cyatheoides*) and *'ohelo la'au* (*Vaccinium calycium*), listed as characteristic were not seen on the Kaumana Charter School property.

Garish (1995) recorded three varieties of *'ōhi'a* in the lava flow forest: *M. p.* var. *incana*, var. *glaberrima*, and var. *macrophylla*. In addition, he found a number of other native plants to be present— *kopiko* (*Psychotria hawaiiense*), *pilo* (*Coprosma rhynchocarpa*), *hapu'u* (*Cibotium* spp.)—not recorded for the Kaumanmsa Charter School site. Further, ground cover was dominated by swordferns (*Nephrolepis* spp.) and kahili ginger (*Hedychium gardinerianum*), rather than *uluhe* fern. This fern dominated the area surveyed by Palmer & Assoc.

Although certainly not unique for the area, the property does support a largely native ecosystem with respect to the vegetation.

Invertebrate Resources

Plant and invertebrate populations are interdependent. Consequently, host plant presence is one way to describe the health of invertebrate populations. The youth of the area lava flow and native forest it supports, and consequently the very limited diversity of Hawaiian host plants, limited the number and diversity of native invertebrates. The dominance of *uluhe* fern, which is largely uninteresting to arthropods, also contributes to keeping the biomass and biodiversity low. Additionally, the low elevation means a higher number of introduced predators, such as ants, have easy access to the native fauna.

Alien predatory ants are a major cause for the scarcity of native arthropods. The long-legged ant (*Anoplolepis gracilipes*) and the big-headed ant (*Pheidole megacephala*), which prey on other insects (Zimmerman 1948-80) are present on the property. These ants are

well documented as a primary cause of low levels of native arthropods at elevations up to 2000 ft (610 m; Perkins, 1913).

Arthropods Not Present

Although lava tubes are known in the near vicinity, most notably at Kaūmana Cave, our survey revealed no caves on the project property. No native mollusks were noted during this survey.

ARTHROPODA: INSECTA
DIPTERA
Drosophilidae*: Drosophila*
No native *Drosophila* were observed on the property. The location does not provide appropriate host plants for any of the 12 native *Drosophila* species recently listed as endangered or threatened by USFWS (2006).

LEPIDOPTERA
Sphingidae: *Manduca blackburni*
Blackburn's sphinx moth (*Manduca blackburni*), an endangered species (Federal Register, 1999-2000) was not found in this survey. The *Final Rule* (USFWS, 2003) for this large sphinx moth designated Hawai'i Island habitat only at Pu'uwa'awa'a.

Neither the moth's solanaceous native host plant, 'aiea (*Nothocestrum* sp.), nor the best alien host, tree tobacco (*Nicotiana glauca*) were observed in our survey.

Figure 7 (right). Blackburn's sphinx moth (*Manduca blackburni*).

Recommendations Relative to Arthropods

Workers (surveyors, environmental assessment teams, construction crews) should be alert for all these species when working on the property as they may pose a serious risk to some individuals. Supervisors should be aware of any special allergy by employees. Some individuals can experience anaphylactic reactions to venom (e.g., bee stings). When moving trash, stones, or piled brush, the use of gloves and long sleeves in addition to covered shoes & long pants will greatly reduce the risk of accidental contact and bites or stings. Pulling socks up over (outside of) pant cuffs reduces the chance of a

stinging invertebrate crawling up a workers leg (e.g., centipede). See *What Bit Me?* for photos and discussion of Hawaii's long-standing pests (Nishida and Tenorio, 1993).

Avian Resources

Avian diversity and densities were in keeping with the habitat present within the project area, and with the results of at least two surveys conducted on properties close to the subject property in the recent past (David, 2007; David and Polhemus, 2008), and with the findings of numerous other surveys conducted in the South Hilo District during recent years (David, 2001, 2002a, 2002c, 2003a, 2005, 2006a, 2006b; David et al., 2004).

Of the 15-different avian species recorded during this survey all but two are alien to the Hawaiian Islands (Table 3, above). One species, Pacific Golden-Plover is a commonly occurring migratory shorebird species that nests in the High Arctic returning to Hawai'i and the Tropical Pacific during the late summer. They spend the fall and winter months in the central and southern Pacific, and return to the Arctic in late April and early May.

One species detected as an incidental observation while transiting between two count stations, Hawaiian Hawk is an endemic endangered species currently protected under both federal and state of Hawai'i endangered species statutes. This species was first listed as endangered in 1967 (Federal Register 1967), proposed for down listing from endangered to threatened in 1993 (Federal Register 1993), and has recently been proposed for delisting all together (Federal Register 2008).

One dark phase bird was seen soaring high over the canopy on the northern portion of the site. Hawaiian Hawks are currently found in nearly all habitats that still have some large tree components on the island. They are regularly seen foraging in the South Hilo area. Hawk densities are highest in mature, native species dominated forests, with grassy under-stories. This habitat, with high amounts of forest edge, supports large populations of game birds and the four species of introduced rodents known from the island, all of which are prey items for the hawk. Additionally, this type of habitat also provides numerous perches and nesting sites suitable for this species (Klavitter 2000).

The Hawaiian Hawk, or *'io*, is the only extant *falconiforme* in Hawai'i. It is currently endemic to the Island of Hawai'i. Sub-fossil remains indicate that it was also formerly found on Moloka'i and Kaua'i (Olson & James 1997). Several incidental unconfirmed sightings of this species exist from Kaua'i (Dole 1879, Beaglehole, 1967) and Maui (Banko 1980c). This species was first mentioned in the western literature by Cook and King in 1784 and was scientifically described by Peale in 1848 from a specimen collected in "Kealakekua" (Medway 1981, Peale 1848).

The most current population estimates based on John Klavitter's research extrapolates that there were 1,457 Hawaiian Hawks present on the island in 2000, and that, in his

estimation, represents a population that is equal to or higher than what was present in pre-contact times (Klavitter 2000). The Hawaiian Hawk breeding season starts in late March, chicks hatch in May, and begin fledge in July (Griffin et al. 1998). Although hawks use resources in most forest habitats they usually pick *'ōhi'a* trees (*Metrosideros polymorpha*) in which to nest. Of 112 nests found during the 1998 and 1999 nesting seasons, 82% of the nests were located in *'ōhi'a* trees (Klavitter 2000).

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), or *ua'u*, and the threatened Newell's Shearwater (*Puffinus auricularis newelli*), or *'a'o*, over-fly the project area between the months of May and November (Banko 1980a, 1980b, Day et al. 2003a, Harrison 1990).

Hawaiian Petrels were formerly common on the Island of Hawai'i (Wilson and Evans 1890–1899). This pelagic seabird reportedly nested in large numbers on the slopes of Mauna Loa and in the saddle area between Mauna Loa and Mauna Kea (Henshaw 1902), as well as at the mid-to-high elevations of Mount Hualālai. Within recent historic times, Hawaiian petrels have been reduced to relict breeding colonies located at high elevations on Mauna Loa, and possibly, Mount Hualālai (Banko 1980a, Banko et al. 2001, Cooper and David 1995, Cooper et al. 1995, Day et al. 2003a, Harrison 1990, Hue et al. 2001, Simons and Hodges 1998).

Newell's Shearwaters were formerly common on the Island of Hawai'i (Wilson and Evans 1890–1899). This species breeds on Kaua'i, Hawai'i, and Moloka'i in extremely small numbers. Newell's Shearwater populations have dropped precipitously since the 1880s (Banko 1980b, Day et al., 2003b). This pelagic species nests high in the mountains in burrows excavated under thick vegetation, especially *uluhe* (*Dicranopteris linearis*) fern.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983, Simons and Hodges 1998, Ainley et al. 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961, Telfer 1979, Sincock 1981, Reed et al. 1985, Telfer et al. 1987, Cooper and Day 1998, Podolsky et al. 1998, Ainley et al. 2001). There is no suitable nesting habitat within or close to the project area for either of these pelagic seabird species.

Mammalian Resources

The findings of the mammalian survey are in keeping with the habitat present within the project area, and with the results of at least two surveys conducted on properties close to the subject property in the recent past (David 2007, David and Polhemus 2008), and with the findings of numerous other surveys conducted in the South Hilo District during recent years (David 2001, 2002b, 2003a, 2003b, 2005, 2006a, 2006b, David et al. 2004).

Although, Hawaiian hoary bats were not recorded during this survey, bats have been recorded on numerous recent surveys conducted within the general Hilo area (Bonaccorso et al. 2005, 2007, David 2001, 2002b, 2003a, 2003b, 2005). It can be expected that Hawaiian hoary bats use resources within the general project area on a seasonal basis.

The Hawaiian hoary bat is a typical lasurine bat, and as such, they primarily lead a solitary existence, described as "over-dispersed". They generally roost cryptically in foliage, which makes them difficult to study (Findley and Tomich 1983, Jacobs 1994, Carter *et al*. 2000). Fundamental research into this species distribution and life cycle has just begun (Bonaccorso et al. 2005, 2007). Data gathered as part of a three year project to study this species, it distribution, densities and life history is just being prepared for publication. Key findings include the opinion that at least on the Island of Hawai'i, the bat is ubiquitous in areas that still have forest or dense cover. They have also concluded that the species is a human commensal species and has adapted to roost in, and prey upon alien species (Bonaccorso et al. 2005, 2007).

Potential Impacts to Protected Species

Flora

No protected plant species were recorded from the property. In areas further from development (see Palmer and Associates Consulting, 1998), several listed species occur in habitat which differs primarily in occurring on ancient lava flows rather than an historical lava flow.

Invertebrates

No federally or state listed endangered or threatened species (USFWS, 2006) were noted in this survey. No anticipated actions related to the proposed project activity in the surveyed locations are expected to threaten entire species or entire populations. There is no federally designated Critical Habitat for any invertebrate species on or adjacent to the subject property.

Vertebrates

There is a small potential that construction activities or habitat modification associated with this project may result in impacting the following four species, which are all protected under both federal and State of Hawai'i endangered species statutes.

Hawaiian Hoary Bat
Hawaiian hoary bats were not detected during this survey, but they have been recorded within the general project area on numerous occasions. With the current scientific information available, it is not known if bats ever roost within the project site. Whether the clearing and the modification of portions of the remaining vegetated areas within this site will result in deleterious impacts to this species is difficult to ascertain. The principal potential impact that clearing and grubbing of the vegetated portions of the site poses to bats is disturbance to roosting female bats during the pupping season, when the females are tending to their young, and are less likely to be able to rapidly vacate a roost tree or bush as it is being felled, or cleared.

Hawaiian Hawk
The principal potential impact that development of this project poses to Hawaiian Hawks is during the clearing and grubbing operations. There is also a small chance that noise associated with the actual construction of the project could disturb birds nesting in the general project area. If disturbed while sitting on eggs or caring for young, adult birds may abandon the nest putting their eggs, and or young, at grave risk of harm or mortality.

Hawaiian Petrel and Newell's Shearwater
The principal potential impact that developing this site poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by exterior lighting that may be required in conjunction with construction activities, and, or the servicing of construction equipment at night, and following build-out by street lights and building lights associated with the school facilities.

Potential Impacts to Critical Habitat

There is no federally delineated Critical Habitat within or close to the project site, thus the clearing, grubbing and construction of the proposed school and associated appurtenances will not result in any impacts to federally designated Critical Habitat.

Conclusions

There is nothing unique about the project site or it's vegetation. There is abundant like habitat in, and around Hilo. It is not expected that the construction or operation of the

proposed school will result in deleterious impacts to native avian or mammalian resources present within the general project area.

1. To reduce the potential for interactions between clearing grubbing and construction activity and Hawaiian hoary bats, it is recommended that clearing and grubbing not be undertaken during the period that bats are caring for young; namely between the months of May and late July (Menard 2001, Bonaccorso et al., 2005)

2. To avoid disturbance to nesting Hawaiian Hawks audio playback nesting activity surveys should be conducted by a qualified ornithologist on the site where large trees will need to be removed prior to the onset of clearing and grubbing activities. This is to ensure that the construction activities will not disturb nesting Hawaiian Hawks. If nesting activity is detected, consultation with the U. S. Fish & Wildlife Service will be required prior to conducting further clearing activity within 500 meters of the nest tree. The currently approved protocols for conducting such a survey are based on those developed by John Klavitter during his multi-year island wide survey of Hawaiian Hawks (Klavitter, 2000). This recommendation may be mute if the current petition to delist the Hawaiian Hawk is enacted.

3. To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting planned to be used during construction be shielded (Reed et al. 1985, Telfer et al. 1987). This mitigation would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Hawaii County Code § 14 – 50 *et seq.* which requires the shielding of exterior lights so as to lower the ambient glare caused by unshielded lighting to the astronomical observatories located on Mauna Kea.

GLOSSARY[3]

Adventive: organisms introduced to an area but not purposefully.

Alien: occurring in the locality it occupies ONLY with human assistance, accidental or purposeful; not native. Both Polynesian introductions (e.g., coconut) and post-1778 introductions (e.g., guava, goats, and sheep) are aliens.

Anaphylactic: hypersensitivity resulting in a sudden severe and potentially fatal allergic reaction, marked by a drop in blood pressure, difficulty in breathing, itching, and swelling

Arthropod: insects and related invertebrates (e.g., spiders) having an external skeleton and jointed legs.

Endemic: naturally occurring, without human transport, ONLY in the locality occupied. Hawaii has a high percentage of endemic plants and animals, some in very small microenvironments.

Entomology: the study of insects and other arthropods

Indigenous: naturally occurring without human assistance in the locality it occupies; may also occur elsewhere, including outside the Hawaiian Islands. (e.g., Naupaka kahakai (*Scaevola sericea*) is the same plant in Hawai'i and throughout the Pacific).

Insects: arthropods with six legs, and bodies in 3 sections

Invertebrates: animals without backbones (insects, spiders, snails / slugs, shrimp)

Larva/larval: an immature stage of development in offspring of many types of animals.

Mollusk: invertebrates in the phylum Mollusca. Common representatives are snails, slugs, mussels, clams, oysters, squids, and octopuses.

Native: organism that originated in area where it lives without human assistance. May be indigenous or endemic.

Nocturnal: active or most apparent at night.

Purposefully introduced: an organism brought into an area for a specific purpose, for example, as a biological control agent.

Rare: threatened by extinction and low numbers.

Species: all individuals and populations of a particular type of organism, maintained by biological mechanisms that result in their breeding mostly with their kind.

3 Glossary based largely on definitions in *Biological Science: An Ecological Approach*, 7th ed., Kendall/Hunt Publishing Co., Dubuque, a high school text; on the glossary in *Manual of Flowering Plants of Hawai'i*, Vol.2, Wagner, et al., 1999, Bishop Museum Press, and other sources.

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Appendix E
Archaeological Assessment Survey

Pacific Legacy

Incorporated

CULTURAL RESOURCES CONSULTANTS

Hawai'i Offices:
Kailua, O'ahu
Wailuku, Maui
Hilo, Hawai'i

California Offices
Santa Cruz
Berkeley
Cameron Park
Chico
Quartz Hill

ARCHAEOLOGICAL ASSESSMENT SURVEY
OF THE
CONNECTIONS CHARTER SCHOOL
KAŪMANA PROPERTY
SOUTH HILO DISTRICT
ISLAND OF HAWAI'I

Pacific Legacy: Exploring the past, informing the present, enriching the future.

ARCHAEOLOGICAL ASSESSMENT SURVEY
OF THE
CONNECTIONS CHARTER SCHOOL
KAŪMANA PROPERTY
SOUTH HILO DISTRICT
ISLAND OF HAWAI'I

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December 2008

ABSTRACT

At the request of Wil Chee-Planning and Environmental, Inc., Pacific Legacy Inc., conducted an archaeological assessment survey of a 72.34 acre property (TMK (3) 2-2-006:141) located within the *ahupua'a* of Ponahawai, District of South Hilo, on the island of Hawai'i. The property is intended to serve as the future campus of the Connections Charter School. No previous archaeological investigations had been conducted in this area. Prior to the field survey, an examination of geologic maps revealed that the project area rests completely within the land covered by the 1880-1881 Mauna Loa lava flow. This historic *pāhoehoe* flow would have destroyed any pre-existing archaeological structures which might have been located within the project area. For this reason, few archaeological remains were anticipated to be found. In order to determine whether any archaeological sites did exist on the property, Pacific Legacy archaeologists conducted a pedestrian survey of the project area. The dense nature of the area's vegetation made survey conditions difficult. In all, a total of 12 transects were walked. These transects were spaced throughout the project property, providing a representative sample of all areas. No archaeological sites were noted along any of the transects. This suggests that human activity within the area since the time of the 1880-1881 flow has been minimal, probably being limited to the passage of the occasional pig hunter. Given the relatively recent nature of the area's geology and the fact that no structural features were noted during the survey, it is felt that the development of the Kaūmana parcel will not impact any archaeological resources. Underground lava tubes are, however, known to exist within the area of the 1881 flow. The main entrance to the Kaūmana Cave complex is located just west of the property on the opposite side of the road. One lava tube, known to run beneath the western half of the property, and another located just outside the property boundary were investigated and found to be subject to periodic flooding during times of heavy rainfall. Such flooding would have washed away any cultural remains or human burials previously extant within the caves. Due to the dense nature of the vegetation presently covering the property, there exists the possibility that as of yet undiscovered lava tubes may exist within the project area. It is suggested therefore that an archaeological monitor be on call during construction activities in order to inspect any previously undiscovered lava tubes that may be encountered.

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Frontispiece: The dense vegetation encountered within the project area (View South).

1.0 INTRODUCTION

At the request of Wil Chee-Planning and Environmental, Inc., Pacific Legacy Inc., conducted an archaeological assessment survey of a 72.34 acre property (TMK (3) 2-2-006:141) located within the *ahupua'a* of Ponahawai, District of South Hilo, on the island of Hawai'i. The property is intended to serve as the future campus of the Connections Charter School.

1.1 PROJECT AREA

The project area is located on the lower slopes of the shield dome volcano of Mauna Loa, inland of the town of Hilo (Figure 1). While the bulk of the property is situated within the *ahupua'a* of Ponahawai, a very small sliver along its southern edge falls within the *ahupua'a* of Kukuau 2 (Figure 2). The project area is situated east of the settlement of Kaūmana and immediately south of Kaūmana Drive. The property is divided into almost equal halves by Edita Street, which runs southeast from Kaūmana Drive cutting down through the center of the project area (Figure 3). As can be seen in aerial photographs, the parcel is edged along much of its perimeter by residential homes (Figure 4). The majority of these houses are of relatively recent construction, having been built within the last 10 to 15 years. Just west of the property, on the far side of Kaūmana Drive, is the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park. A branch of this lava tube complex runs under the western half of the project area, ending at an opening along the western edge of Edita Street.

The property is situated between approximately 600 and 900 feet in elevation. Its western (upper) half extends from about the 750 to 900 foot contours, while its eastern (lower) half extends from about the 600 to 750 foot level. The terrain is gently sloping from west to east. The underlying geology of the project area is distinct from that of the lands lying immediately north and south of it, for it rests completely within the course of the 1880-1881 lava flow (Figure 5). This narrow tongue of *pāhoehoe* lava originated on the slopes of Mauna Loa and flowed down slope toward Hilo, halting just two miles short of the town. The lavas of the 1880-1881 flow are Kau Basalts and consist of relatively smooth surfaced *pāhoehoe* that has been distorted by uplifts and pressure fractures (Wolfe and Morris 1996:11-12). Very little soil has developed atop the flow, and the official soil designation for the area is simply "lava flows, *pāhoehoe*" (rLW) (Sato 1973:34).

The closest source of potable water is the Waipāhoehoe Stream, which flows north of the project area, passes close to its eastern corner, and eventually feeds into the Wailoa River. Wai-pāhoehoe can be translated as "*pāhoehoe* (smooth lava) water" (Pukui et al. 1974:227). The rainfall within the area is between 4000 millimeters (c. 160 inches) and 5000 millimeters (c. 200 inches) annually. Despite the lack of soil, this relatively high rainfall has resulted in the area being blanketed in dense vegetation.

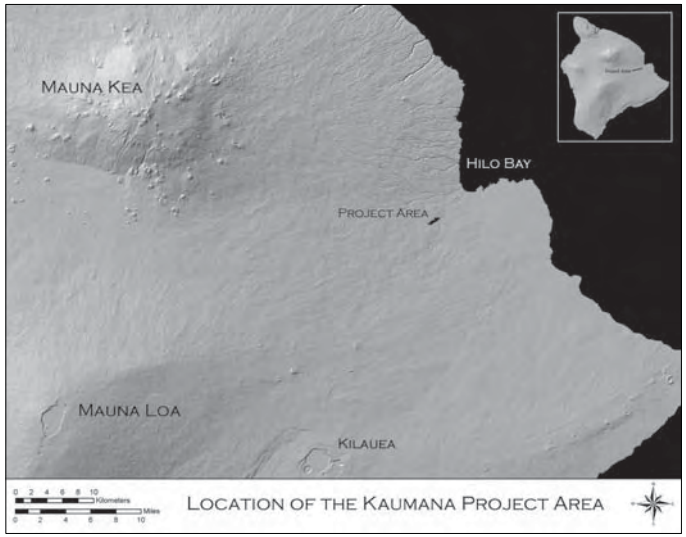

Figure 1. Location of the Kaūmana assessment survey area.

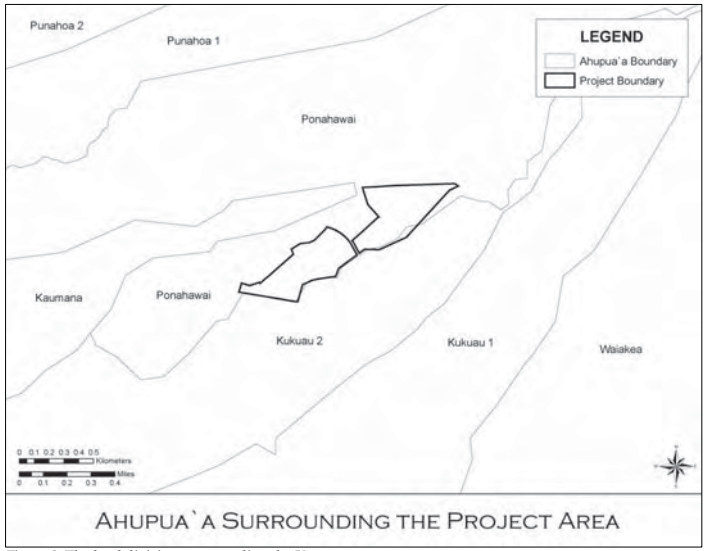

Figure 2. The land divisions surrounding the Kaūmana assessment survey area.

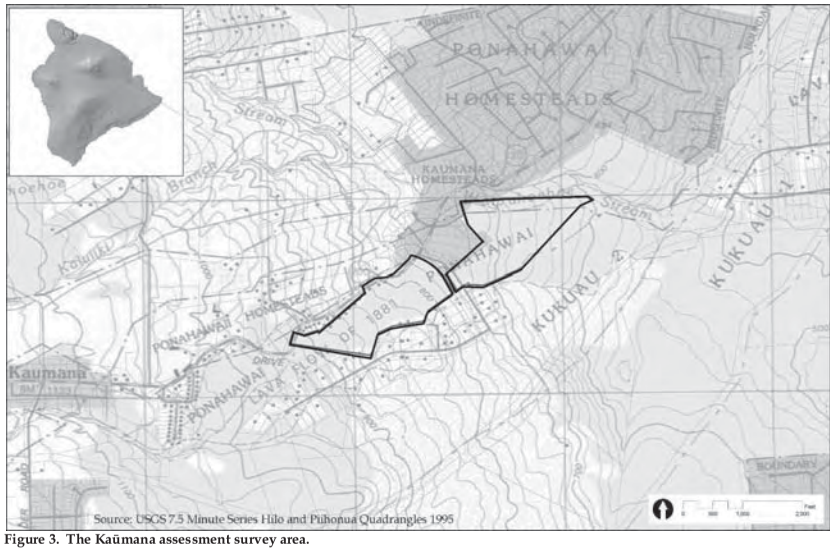

Figure 3. The Kaūmana assessment survey area.

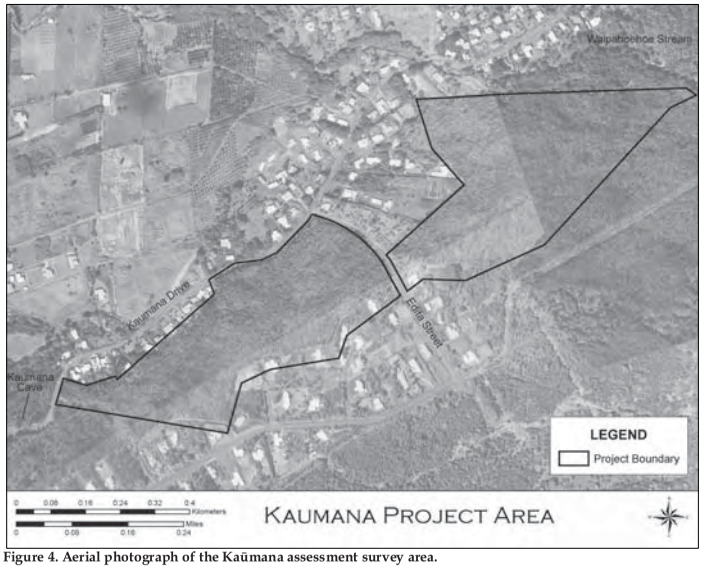

Figure 4. Aerial photograph of the Kaūmana assessment survey area.

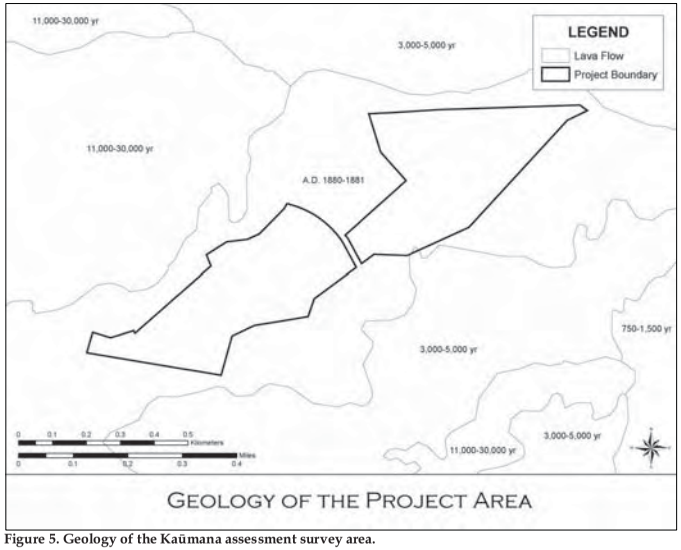

Figure 5. Geology of the Kaūmana assessment survey area.

The composition of the vegetation covering the project area, though relatively similar, differs slightly between the western and eastern halves of the property. The western (upland) half of the project area is covered almost exclusively in native vegetation. This consists of an open canopy forest of scattered *'ohia* (*Metrosideros sp.)* trees with an understory of *uluhe* (*Dicranopteris linearis*) fern (Figure 6). The *uluhe* ferns form a dense tangle of intertwining fronds. This mat of vegetation, which in places stands up to 8 or more feet in height, makes passage through the area difficult. It also makes it virtually impossible to examine the ground surface more than a meter on either side of the cut trail.

In the eastern (lower) half of the project area, the vegetation is slightly thinner in places, with a mix of native and non-native species. The non-natives are more common along the outer edges of the property. The dominant non-native species is strawberry guava (*Psidium cattleianum*), which grows in dense stands along the southern boundary of the project area.

Figure 6. Vegetation in the upper project area as seen from Edita Drive (View West).

2.0 HISTORIC BACKGROUND

2.1 PRE-CONTACT PERIOD

There is very little evidence for any human activity within the project area during the pre-Contact period. Boundary Commission testimony indicates that bird hunting was carried out in the forests further inland at a place known as Kalapalapanui ("the boundary between Waiakea and Kaūmana runs *mauka* to Kalapalapanui, an *oioina* and place where we used to catch birds" Boundary Commission Books 2:1). It is probable that the forested area around what is now Kaūmana settlement

2.2 HISTORIC PERIOD

At the time of the Māhele `Āina (land division, also known as the Great Māhele) in the 1840s, when the private ownership of land was first established in the Hawaiian Islands, two parcels adjacent to the project area were awarded to native claimants.

Land Court Award parcel 8521-B was awarded to George Hu`eu Davis, the son of Isaac Davis, an advisor to Kamehameha I. From his father, George Hu`eu Davis (sometimes referred to in land court and other early documents as G. D. Hu`eu or George Hu`eu) inherited claim to the *ahupua'a* of Kukuau 2 in the district of Hilo, Waikoloa in South Kohala and Ki'ilae in South Kona. Unlike many Land Court Award claims, which contain information on the use of the property at the time of the claim (what was grown on it, whether there was a house there, etc.) George Hu`eu Davis' claim covers such a wide area that the document contains no direct information on the Kukuau parcel.

The Land Court Award parcel (number 4983) is located immediately north the project area. It was claimed by an individual named Kukuleau, indicating that there was at least some human activity around the project area in the early historic period.

During the years 1880 and 1881, a lava flow that originated on the slopes of Mauna Loa passed down through the *ahupua'a* of Ponahawai burying everything in its path (Figure 5). As this flow approached and threatened Hilo, the people of the town called upon Princess Ruth Ke'elikōlani Keanolani Kanōhoahoa for help. Princess Ruth was well known and loved for her adherence to traditional Hawaiian ways. The residents of the threatened community requested that she intercede on their behalf with the volcano goddess Pele, whose fiery flow was threatening their homes. Hawaiian language newspapers of the time reported that Princess Ruth journeyed to the lower edge of the flow where she chanted and made offerings to the goddess. That evening she lay down to sleep in the path of the lava. The next morning the flow had stopped in front of the sleeping princess (Silva n.d.:3). Though it spared Hilo, the 1880-1881 flow did inundate the present project property. This lava would have destroyed any evidence of previous human activity in the area.

3.0 FIELD INVESTIGATIONS

3.1 FIELD METHODS

Since no previous archaeological investigations had been conducted within the project area, a pedestrian field survey of the property was performed. This survey was undertaken by Pacific Legacy archaeologists Rowland B. Reeve and Jenny Schabell over the two day period of November 6th and November 7th, 2008. Justin Thatcher, a resident of Kaūmana who is familiar with the subject property, graciously volunteered to act as guide during the survey. The field crew was also accompanied by biologist Steven Montgomery who was conducting an entomological survey of the project area. Paul Cleghorn, Ph.D. served as the Principle Investigator for the project.

Given the geologic history of the project area, few archaeological remains were anticipated to be encountered during the survey. On various pig hunting forays into the project area, Mr. Thatcher had noted the presence of what appeared to be badly disturbed historic walls near the course of Waipāhoehoe Stream, just outside the property, and had found historic bottles associated with these walls. As a result, it was felt that the greatest potential for encountering sites was in eastern (lower) half of the project area, at its eastern corner and along its northern edge where the property lies closest to Waipāhoehoe Stream. Field survey was therefore begun in the eastern half of the project area. The first transect line started at the property's eastern corner and ran along its northern boundary. It soon became apparent that the dense nature of the area's vegetation and the resulting lack of visibility (Figures 7 and 8) would make it impossible to run an expanded sweep line with team members spread out every 10 to 20 meters. For safety reasons the survey team was kept in close proximity as it moved along each transect line.

In all, a total of 12 transects were walked. These transects were spaced throughout the project property, providing a representative sample of all areas. Four relatively lengthy transects were run through the eastern (lower) half of the project area, while 1 long and 7 shorter transects were run through the property's western (upper) half (Figure 9). Fortunately, the Connections Charter School had previously cut a roughly 2 to 3 meter wide trail down the center of the western half of the project property and it was possible not only to use this trail as a transect, but to cut transects perpendicular to it extending out to the edges of the property (Figures 10 and 11).

Figure 7. Vegetation in lower project area (View South).

Figure 8. Survey team cutting transect through dense *uluhe* fern (View West).

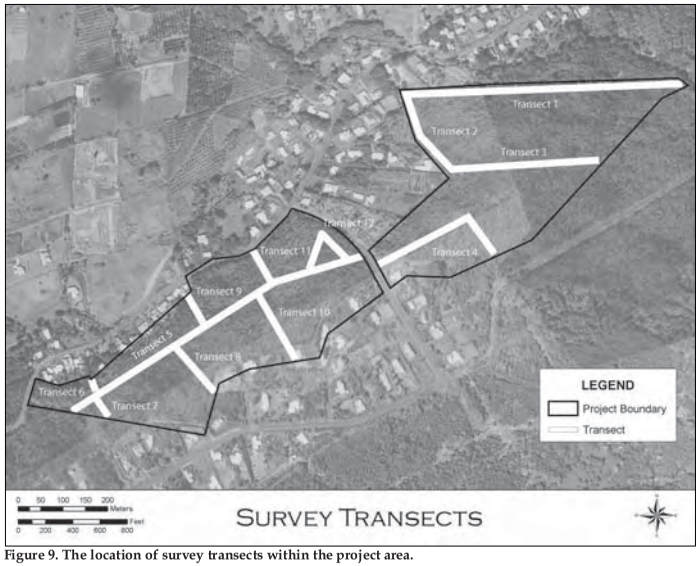

Figure 9. The location of survey transects within the project area.

Figure 10. Vegetation in upper project area (note figure in lower left).

Figure 11. Trail through upper project area (View East).

3.2 FINDINGS

No archaeological sites were encountered along any of the transects walked during the course of the survey. This was not surprising given the relatively recent nature of the area's geology. Even in those areas closest to Waipāhoehoe Stream there is not enough soil development to have encouraged agricultural activity within the area following the 1880-1881 lava flow. It appears that, following the flow, all permanent human use of the project area ceased. At present the area appears to be visited only by the occasional pig hunter.

It is impossible to tell what, if any, archaeological sites may have existed in the project area prior to 1880. Boundary commission records indicate that bird hunting was carried out in the forests further *mauka* (inland), and we know that the more *makai* (coastal) village of Hilo was a major pre-Contact settlement and agricultural area. As for Kaūmana itself, it may have held scattered homesteads, probably located along the course of Waipāhoehoe Stream. If such a homestead did exist within the project area, it would have been destroyed by the 1880-1881 lava flow.

Underground lava tubes are known to exist within the area of the 1880-1881 flow. The main entrance to the Kaūmana Cave complex rests just north of the property on the opposite side of the road. One lava tube runs beneath the western half of the property and the entrance to another is located just outside the property boundary. Both of these tubes were investigated during the present survey. They were found to be subject to periodic flooding during times of heavy rain. Such flooding would have washed away any cultural remains or human burials previously extant within the caves.

4.0 SUMMARY AND RECOMMENDATIONS

No archaeological surface features were encountered during the survey of the Kaūmana project parcel. Any sites that may have existed in the project area prior to the 1880-1881 lava flow would have been destroyed at that time. The absence of sites suggests that human activity within the property since 1880 has been minimal, probably being limited to the passage of an occasional pig hunter. Given this lack of observed structural features, and taking into consideration the relatively recent nature of the project area's geology, it is felt that the development of the Kaūmana parcel will not impact any archaeological resources.

Due to the dense nature of the vegetation presently covering the property, there exists the possibility that as of yet undiscovered lava tubes may exist within the project area. Such tubes have the potential to contain human remains. It is therefore suggested that an archaeological monitor be on call during any construction activities in order to inspect any previously undiscovered lava tubes that may be encountered.

5.0 REFERENCES

Boundary Commission Books
These five volumes of statements and testimony regarding land boundaries presented before the Board of Commissioners for Boundaries are preserved on microfilm in the Archives of the State of Hawaii.

Pukui, Mary Kawena, Samuel Elbert and Esther Mookini
1974 *Place Names of Hawaii*. University of Hawaii Press. Honolulu.

Sato, H. H., W. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr.
1973 *Soil Survey of the Island of Hawaii, State of Hawaii*. United States Department of Agriculture, Soil Conservation Service, Washington.

Silva, Kalena
n.d. "Princess Ruth Ke'elikōlani, Hawaiian Ali'i" in Biography Hawai'i: Five Lives, A Series of Public Remembrances. Center for Biographical Research, University of Hawai'i at Mānoa, Honolulu (http://www.hawaii.edu/biograph/biohi/ruthguide.pdf).

Wolfe, Edward W. and Jean Morris
1996 Geologic Map of the Island of Hawai'i. Map # 1-2524-A and accompanying pamphlet, published by the United States Department of the Interior, U. S. Geological Survey.

Appendix F

Archaeological Field Inspection of Kaumana Cave

Pacific Legacy

Historic Preservation

CULTURAL RESOURCES CONSULTANTS

Hawai'i Offices:
Kailua, O'ahu
Wailuku, Maui
Hilo, Hawai'i

California Offices:
Arnold
Berkeley
Chico
El Dorado Hills
Quartz Hill
Santa Cruz

ARCHAEOLOGICAL FIELD INSPECTION
OF KAŪMANA CAVE,
SOUTH HILO DISTRICT
ISLAND OF HAWAIʻI

Pacific Legacy: Exploring the past, informing the present, enriching the future.

ARCHAEOLOGICAL FIELD INSPECTION
OF KAŪMANA CAVE,
SOUTH HILO DISTRICT
ISLAND OF HAWAIʻI

Prepared by:
Rowland B. Reeve, M.A.

Pacific Legacy, Inc.
30 Aulike Street, Suite 301
Kailua, HI 96734
(808) 263-4800

Prepared for:
Wil Chee Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814

June 2010

This brief report presents the results of an archaeological field inspection conducted within a portion of the Kaūmana Cave located in Hilo, Hawai'i. It is intended to serve as an addendum to the "Archaeological Assessment Survey of the Connections Charter School Kaūmana Property, South Hilo District, Island of Hawai'i," a report prepared for Wil Chee Planning by Pacific Legacy Inc. and submitted in December of 2008. This initial report documented the surface examination of a 72.34 acre property (TMK (3) 2-2-006:141) located within the *ahupua'a* of Ponahawai, District of South Hilo, on the island of Hawai'i (Figure 1). The property is intended to serve as the future campus of the Connections Charter School. The Archaeological Assessment Survey found no surface archaeological remains to be present within the two parcels that comprise the property (Figure 2).

An examination of geological maps undertaken at the time of the Assessment Survey revealed that the project area rests completely within the land covered by the 1880-1881 Mauna Loa lava flow. This historic *pāhoehoe* flow would have destroyed any pre-existing archaeological structures which might have been located within the project area. The flow, however, also created a number of subsurface lava tubes, some of which run beneath the survey property. Just west of the property, on the far side of Kaūmana Drive, is located the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park. A branch of this lava tube complex runs under the western half of the project area, ending at an opening along the western edge of Edita Street. This opening has been barred to prevent access, and a culvert has been dug to divert flood waters flowing out of the cave from crossing Edita Street. Conversations with local residents indicated that this and other tubes in the area are subject to periodic flooding during times of heavy rainfall. At the time the Assessment Survey was conducted it was felt that such flooding would have washed away any cultural remains or human burials that might have been previously extant within the caves.

Following completion of the Archaeological Assessment Survey, Dr. Fred D. Stone, a geology professor at the University of Hawai'i Hilo, raised concerns as to the possibility that historic remains might rest within the section of Kaūmana Cave that extends beneath the project area. These concerns were included among comments he made to the draft Environmental Assessment for the Connections Charter School property (Stone 2009). According to Dr. Stone, "Early visitors to the cave chipped their names and dates into the glassy lava tube lining, and this is now part of the cave history. Electrical insulators attached to the cave wall indicate that at some past date, the cave had been wired for visitors" (Stone 2009:10). In order to address Dr. Stone's concerns and to determine whether any historic elements did indeed exist within the limits of the Connections Charter School parcel, an archaeological field inspection of the cave was undertaken.

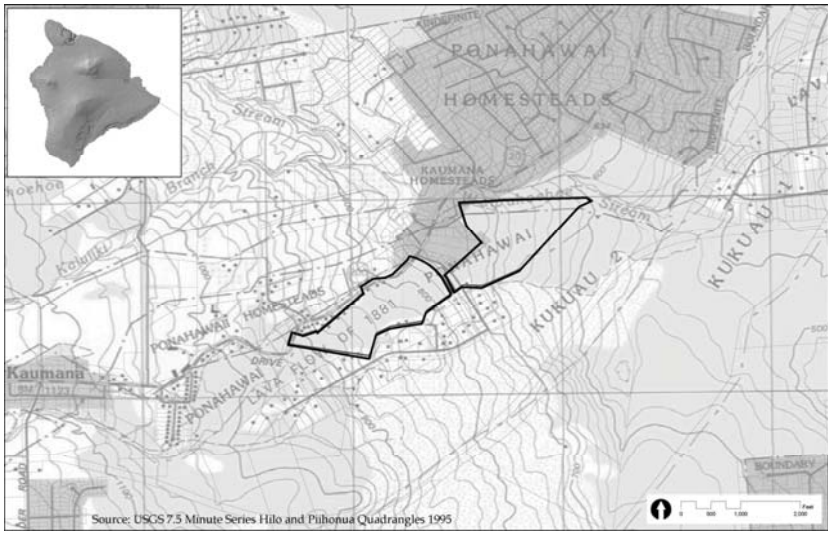

Figure 1. Connections Charter School Kaūmana property Archaeological Assessment project area.

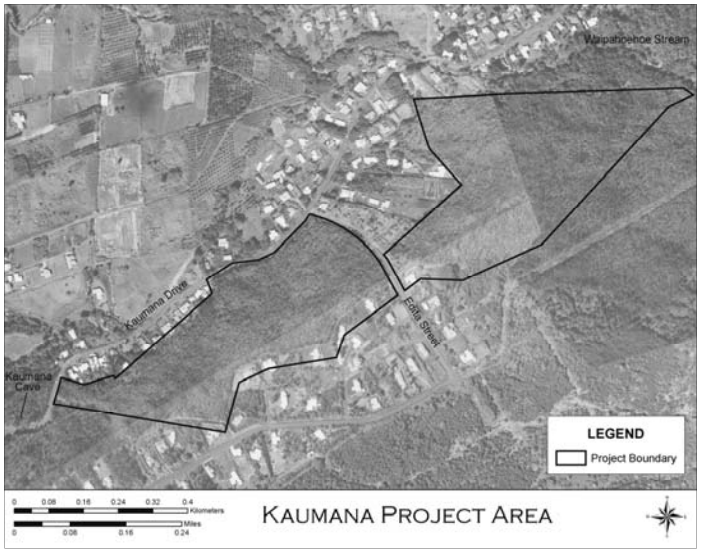

Figure 2. Aerial photograph of the Kaūmana Archaeological Assessment Survey project area.

This archaeological field inspection was conducted on the 14th of June, 2010 by Pacific Legacy archaeologist Rowland Reeve. He was accompanied by Mr. John Thatcher, headmaster of the Connections Charter School. A map of the cave system, showing its relationship to the surface property boundaries, had been prepared by Wil Chee Planning from existing sources (including both a 1953 survey and a 1992 Hawai'i County survey of the lava tube). This map was utilized as a guide while exploring the cave. The "Puainako Road Extension Environmental Impact Study: Kaūmana Cave" (Stone 1992), a report prepared in 1992 by Dr. Stone, which provides a detailed description of the cave, was also used for reference during the field inspection.

The inspection was begun at the Kaūmana Caves County Park entrance. A thorough examination was made of the lava tube as it extended *makai* (down slope) as far as the barred exit at Edita Street. Although a map of the cave extending for half a mile beyond this point was prepared in 1953 by Caceres, Moore and Carroll (Stone 1992:3), at present this lower portion of the tube is no longer accessible, having been sealed off by the construction of Edita Street. Due to the lack of access, it is impossible to say for certain whether any historic properties exist within this lower section of the cave. However, descriptions of the more *makai* portions of the tube provided by members of the Hilo Lions Club who explored the cave to a distance of 4,700 feet in 1953 (Halliday 1997) make no mention of any cultural remains. The Lions themselves did, however, leave behind a banner and document which now, if they still exist, could be considered historic elements.

No attempt was made to examine the branch of the lava tube running west from the County Park entrance, as it extends away from the Connections Charter School project area.

Although the walls and ceiling of the lava tube were thoroughly examined, no evidence was found of the "electrical insulators attached to the cave wall" that were mentioned by Dr. Stone (Stone 2009:10).

In contrast, the "names and dates [chipped] into the glassy lava tube lining" (Stone 2009:10) were clearly in evidence. An abundance of pecked names were found in the illuminated area directly inside the entrance. Further back into the cave the names became more sporadic, with dense concentrations along stretches where the walls were smooth and glassy (Figure 3). An annotated version of the Wil Chee Planning map (Figure 4) shows the approximate locations of these names concentrations in relation to the Connections Charter School project area, while a more detailed map from the 1953 survey shows the main concentrations (Figure 5). The deepest concentration of names was encountered at approximately 850 feet in from the entrance, almost directly beneath Kaūmana Drive. This is well west of the Connections Charter School property. Beyond this point only two sets of pecked names were noted, both of which appear to be of relatively recent age. In addition, several names had been spray painted onto the cave walls. No names that appeared to be older than 50 years in age were found within those sections of the cave that run below the Connections Charter School property.

Figure 3. Concentration of names pecked into the glassy lava surface of the cave wall.

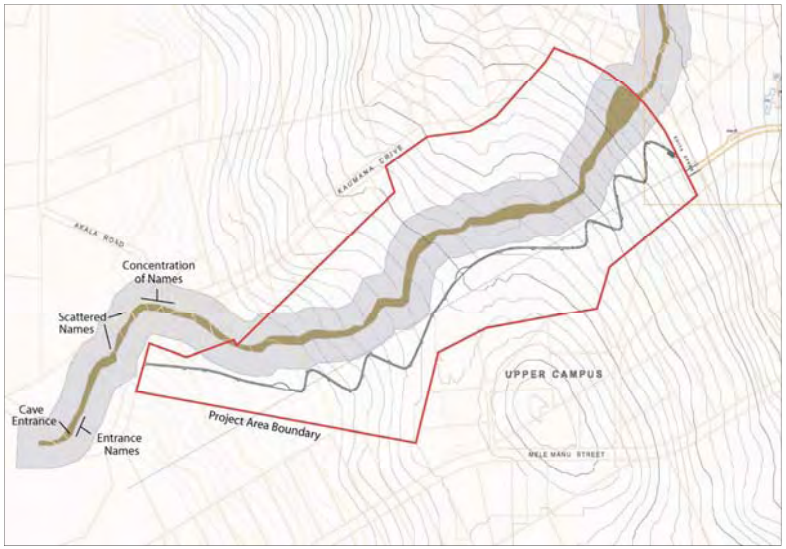

Figure 4. Relative locations of historic names within Kaūmana Cave.

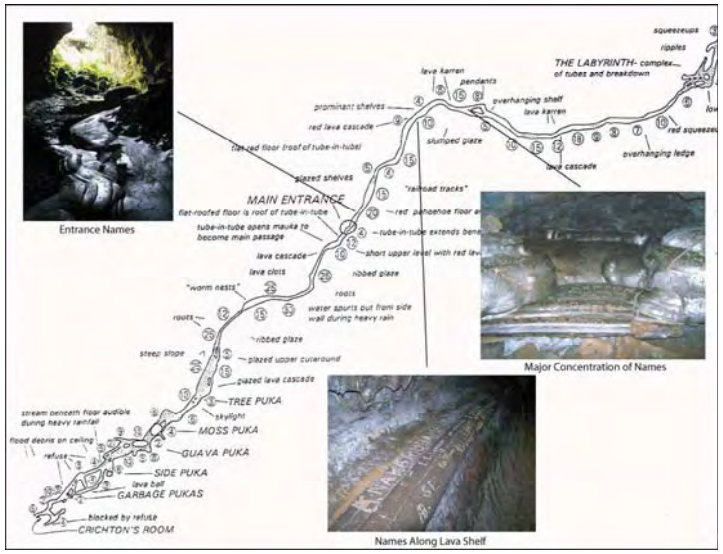

Figure 5. Locations of major name concentrations (base map from 1953 survey).

Though many of these pecked names are clearly modern, others appear (based upon the dates associated with them) to stretch back into the early 20th century. Photographs of a number of these historic names have been included at the end of this report. The earliest date noted was 1915 (Figure 6). Other early names and with dates are from the late 1900s, the 1920s and the 1930s (Figure 7). Several names appear to be associated with a visit to the cave made in 1919 by the Nippon Jinshako Club (Figure 8). Other names date from the Second World War and appear to have belonged to servicemen visiting the cave (Figure 9).

The names and dates pecked into the walls of Kaūmana Cave provide a unique and valuable historic record. None of these names, however, are likely to be impacted by development planned for the Connections Charter School property. Not only do none of these historic names occur in the deeper sections of the cave that run beneath the school property, but the present plan for the property calls for construction to take place only within the *makai* parcel, east of Edita Street. All construction within this lower parcel is planned to be located well away from the projected extent of the cave (based upon the 1953 map). The more *mauka* parcel (west of Edita Street) is planned to be set aside as a natural area used only for educational programs and reforestation projects. The sole structure within this upper parcel would be a raised wooden walkway that would extend the length of the parcel. This walkway would be elevated off the ground, requiring only shallow footings and posts to support it. It would also be located outside a 100-foot buffer around the cave.

With the exception of the carved names, no historic elements were noted during the field inspection of Kaūmana Cave. Any portable historic remains that may once have been present are likely to have been washed away by periodic flooding. As Dr. Stone indicated in his 1992 report, "According to residents across the road from this [the Edita Street] entrance, during heavy rains in the mid-1970s, Kaūmana Cave flooded and water gushed from the cave and covered Edita Street" (Stone 1992:5).

In summary, the present archaeological field inspection encountered no historic remains within those accessible portions of Kaūmana Cave that extend beneath the Connections Charter School property. The use of both the upper and lower Kaūmana parcels by the Connections Charter School, as presently planned, should have no impact on any historic properties present within the lava tube.

Figure 6. This 1915 date is the earliest noted in the cave.

Figure 7. Initials dating from a 1917 visit to the cave.

Figure 8. Names from the Nippon Jin Shako Club visit in 1919.

Figure 9. The name of a U. S. Marine who visited the cave in World War II.

REFERENCES

Halliday, William R.
1997 The Hilo Lions Club 1953 Kaūmana Cave Expedition. Report 97-02, Hawai'i Speleological Survey of the National Speleological Society. Typescript in the University of Hawai'i Hilo Library.

Stone, Fred D.
1992 Puainako Road Extension Environmental Impact Study: Kaūmana Cave.

2009 Comments on the Draft E.A. for Connections Charter School in Kaūmana. Submitted to Wil Chee Planning & Environmental.

Appendix G
Cultural Impact Assessment Correspondence

WIL CHEE – PLANNING & ENVIRONMENTAL

April 23, 2010

Edith Kanaka'ole Foundation
1500 Kalanianaole Avenue
Hilo, HI 96720-4914

Dear Sirs/Madams,

Subject: Environmental Assessment for Connections Public Charter School
Ahupua'a of Ponahawai, District of South Hilo, TMK (3) 2-5-006:141

Connections Public Charter School (CPCS) is proposing to develop a new campus in Kaumana, Hilo, Hawai'i, on lands to be leased from the State Department of Land and Natural Resources (DLNR). The new campus would allow CPCS to expand their educational offerings, consolidate their elementary, intermediary and high school programs at one location, and develop a campus that would be a model of sustainable development.

The property on which CPCS would like to develop their new campus is approximately 72 acres in size and is identified by TMK (3) 2-5-006:141 (refer to Enclosure Figure 1). It is situated on the lower slopes of Mauna Loa, inland from the town of Hilo, at an elevation that ranges between 600-900 feet. The parcel is located off of Kaūmana Drive and is separated into two sections, at its narrowest point, by Edita Street. The property is bounded along much of its perimeter by residences on Kaūmana Drive, Edita Street and Melemanu Street (refer to Enclosure Figure 2). West of the property, on the other side of Kaūmana Drive, is the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park. A branch of this lava tube complex runs under the western half of the project area, ending at an opening along the western edge of Edita Street.

The property is currently undeveloped. The upper or western portion of the property (above Edita Street) is mostly covered by native vegetation consisting of an open canopy forest of 'ohia trees with an understory of uluhe fern. The lower or eastern portion of the property (below Edita Street) is covered by a mix of native and non-native species, such as strawberry guava.

Wil Chee - Planning & Environmental is assisting CPCS prepare a Campus Master Plan and Environmental Assessment (EA), which is needed to secure their lease from DLNR. As part of the EA process, we are trying to obtain information to assess cultural impacts. As an organization that may have knowledge of traditional cultural properties or cultural practices that may occur at or within the immediate vicinity of the property, we kindly ask your assistance to identify potential impacts. To facilitate information gathering, we have enclosed a questionnaire form.

Providing Services Since 1976
Land Use Planners and Environmental Consultants

1018 Palm Drive • Honolulu, Hawai`i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

We would appreciate any comments regarding cultural concerns you may have relative to the property within 30 days of receipt of this letter. If we receive no communication from you within 30 days, we will assume that your organization has no comments to offer.

Your cooperation and assistance in this matter would be greatly appreciated. Should have any questions, or if you would prefer to submit comments via telephone or email, please feel free to contact me at 808-596-4688 or cshen@wcphawaii.com.

Sincerely,

Celia Shen
Planner

Enclosures: 1) Location Maps
2) Questionnaire Form

WIL CHEE – PLANNING & ENVIRONMENTAL

April 23, 2010

Hawaiian Civic Club of Hilo
P.O. Box 543
Hilo, HI 96721

Dear Sirs/Madams,

Subject: Environmental Assessment for Connections Public Charter School
Ahupua'a of Ponahawai, District of South Hilo, TMK (3) 2-5-006:141

Connections Public Charter School (CPCS) is proposing to develop a new campus in Kaumana, Hilo, Hawai'i, on lands to be leased from the State Department of Land and Natural Resources (DLNR). The new campus would allow CPCS to expand their educational offerings, consolidate their elementary, intermediary and high school programs at one location, and develop a campus that would be a model of sustainable development.

The property on which CPCS would like to develop their new campus is approximately 72 acres in size and is identified by TMK (3) 2-5-006:141 (refer to Enclosure Figure 1). It is situated on the lower slopes of Mauna Loa, inland from the town of Hilo, at an elevation that ranges between 600-900 feet. The parcel is located off of Kaūmana Drive and is separated into two sections, at its narrowest point, by Edita Street. The property is bounded along much of its perimeter by residences on Kaūmana Drive, Edita Street and Melemanu Street (refer to Enclosure Figure 2). West of the property, on the other side of Kaūmana Drive, is the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park. A branch of this lava tube complex runs under the western half of the project area, ending at an opening along the western edge of Edita Street.

The property is currently undeveloped. The upper or western portion of the property (above Edita Street) is mostly covered by native vegetation consisting of an open canopy forest of 'ohia trees with an understory of uluhe fern. The lower or eastern portion of the property (below Edita Street) is covered by a mix of native and non-native species, such as strawberry guava.

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Sincerely,

Celia Shen
Planner

Enclosures: 1) Location Maps
2) Questionnaire Form

WIL CHEE – PLANNING & ENVIRONMENTAL

April 23, 2010

Kepa Maly
554 Keonaona Street
Hilo, HI 96720

Dear Mr. Maly,

Subject: Environmental Assessment for Connections Public Charter School
Ahupua'a of Ponahawai, District of South Hilo, TMK (3) 2-5-006:141

Connections Public Charter School (CPCS) is proposing to develop a new campus in Kaumana, Hilo, Hawai'i, on lands to be leased from the State Department of Land and Natural Resources (DLNR). The new campus would allow CPCS to expand their educational offerings, consolidate their elementary, intermediary and high school programs at one location, and develop a campus that would be a model of sustainable development.

The property on which CPCS would like to develop their new campus is approximately 72 acres in size and is identified by TMK (3) 2-5-006:141 (refer to Enclosure Figure 1). It is situated on the lower slopes of Mauna Loa, inland from the town of Hilo, at an elevation that ranges between 600-900 feet. The parcel is located off of Kaūmana Drive and is separated into two sections, at its narrowest point, by Edita Street. The property is bounded along much of its perimeter by residences on Kaūmana Drive, Edita Street and Melemanu Street (refer to Enclosure Figure 2). West of the property, on the other side of Kaūmana Drive, is the main entrance to the Kaūmana lava tube complex, which has been designated as Kaūmana Caves County Park. A branch of this lava tube complex runs under the western half of the project area, ending at an opening along the western edge of Edita Street.

The property is currently undeveloped. The upper or western portion of the property (above Edita Street) is mostly covered by native vegetation consisting of an open canopy forest of 'ohia trees with an understory of uluhe fern. The lower or eastern portion of the property (below Edita Street) is covered by a mix of native and non-native species, such as strawberry guava.

Wil Chee - Planning & Environmental is assisting CPCS prepare a Campus Master Plan and Environmental Assessment (EA), which is needed to secure their lease from DLNR. As part of the EA process, we are trying to obtain information to assess cultural impacts. As an organization that may have knowledge of traditional cultural properties or cultural practices that may occur at or within the immediate vicinity of the property, we kindly ask your assistance to

1018 Palm Drive • Honolulu, Hawai'i 96814 • Phone 808-596-4688 • Fax 808-597-1851 • E-Mail wcp@lava.net

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Your cooperation and assistance in this matter would be greatly appreciated. Should have any questions, or if you would prefer to submit comments via telephone or email, please feel free to contact me at 808-596-4688 or cshen@wcphawaii.com.

Sincerely,

Celia Shen
Planner

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2) Questionnaire Form

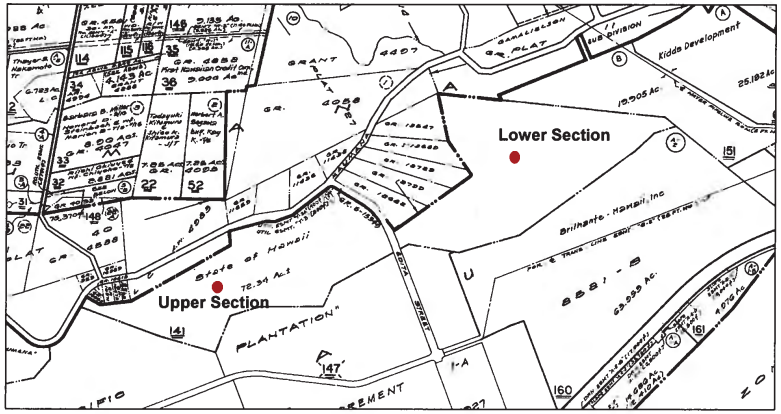


Figure 1. TMK: (3) 2-5-6:141

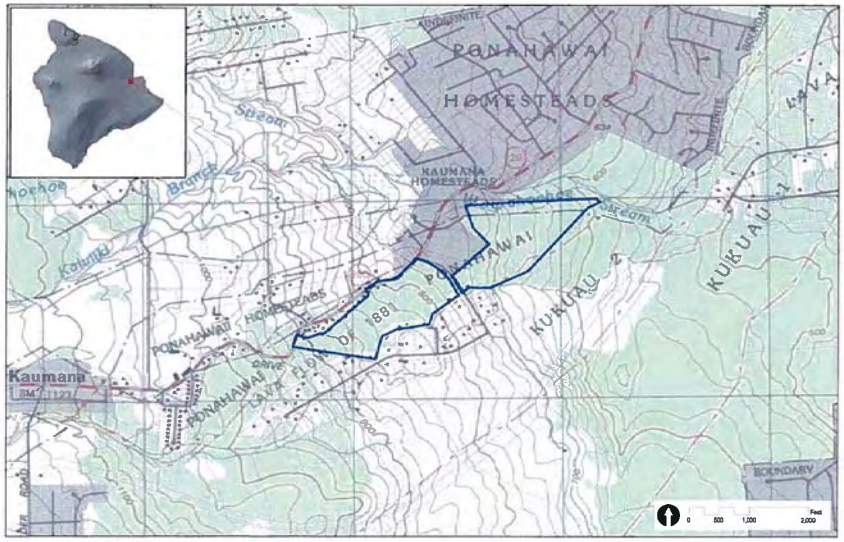


Figure 2. Project Location & Topography

Cultural Assessment Information Form

Project: Connections Public Charter School Master Plan and Environmental Assessment Ahupua'a of Ponohawai, District of South Hilo, Hawai'i, TMK (3) 2-5-006:141.

Name:

Contact Information:

Address _____

Phone _____

Email _____

Background Information:

1. Where were you born?

2. How long have you lived on Hawai'i island?

3. How long have you lived in the area of the subject property?

4. Could you provide information as to your area of interest or expertise, as well as any memberships or affiliations with Hawaiian cultural groups/organizations?

5. What is your relationship to the area? Do you have any personal associations/ties with the subject property?

6. Do you use the subject property or surrounding area? If so, for what purposes and how often?

7. Do you have any knowledge of traditional or cultural practices conducted specific to the subject property or in the vicinity of the project area? If so, what kind of activities are conducted (e.g. hunting, gathering, ceremonial, etc.)?

8. Do you have any concerns about the project affecting cultural sites or practices?

Appendix H

Documentation of Request for Historic Preservation Review

WIL CHEE - PLANNING & ENVIRONMENTAL

August 17, 2010

Pua Aiu, Administrator
Dept. of Land & Natural Resources, State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Dear Participant:

Attached for your review is a Revised Draft Environmental Assessment (EA) prepared pursuant to the EIS Law (HRS 343 and HAR, 11-200).

TITLE OF PROJECT: Connections Public Charter School Master Plan

LOCATION: (island) Hawai'i (district) South Hilo

TAX MAP KEY: (3) 2-5-006:141

Applicant:
Connections Public Charter School
174 Kamehameha Avenue
Hilo, HI 96720
Contact: John L. Thatcher II, CEO; (866) 961-3664

Applicant's Consultant:
Wil Chee – Planning & Environmental
1018 Palm Drive
Honolulu, HI 96814
Contact: Celia Shen; (808) 596 4688; cshen@wcphawaii.com

Approving Agency:
Department of Land and Natural Resources, Land Division
1151 Punchbowl Street, Room 220
Honolulu, HI 96813
Contact: Charlene Unoki; (808) 587 0426

Please send comments to the Applicant and the Consultant. Comments must be received or postmarked by **September 22, 2010.**

Thank you for participating in the Environmental Assessment review process.

WIL CHEE – PLANNING & ENVIRONMENTAL

August 17, 2010

Pua Aiu, Administrator
Dept. of Land & Natural Resources, State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Subject: Historic Preservation Review of the Archaeological Assessment Survey for the Connections Public Charter School Property, Kaūmana, South Hilo, Hawai'i

Dear Ms. Aiu,

By this letter, Wil Chee – Planning & Environmental is hereby requesting a review of the archaeological assessment survey report and an issuance of a letter of "no effect" for the Connections Public Charter School project. Enclosed is the SHPD submittal sheet, a hardcopy of the Archaeological Assessment Survey report and a check for $50.

The original assessment report was completed in August 2008 and was appended to the Draft EA, which was distributed for public and agency review in August 2009. After the conclusion of the comment period, SHDP requested additional investigation of Kaūmana Cave be conducted. The field inspection was completed in June 2010 and has been appended to the original assessment report, which is enclosed in its entirety. The Kaūmana Cave investigation found no historic remains within the accessible portion of the cave that underlies the subject property. Further, due to concerns raised about the project, the campus plan was redesigned by relocating all major school facilities to the property's lower parcel and limiting development in the vicinity of the cave to a lightweight elevated walkway. The investigation therefore concluded that the project should have no impact on any historic resources within the cave. A Revised Draft EA addressing the reconfigured campus plan is being distributed for review and comment.

If you have any questions, please free to contact me at 596-4688 or at cshen@wcphawaii.com.

Regards,

Celia Shen
Planner, Wil Chee – Planning & Environmental

2010.3028

Date: August 17., 2010

Submittal Sheet for Historic Preservation Review Filing Fees

State Historic Preservation Division
601 Kamokila Blvd., #555, Kapolei, Hawai`i 96707

Agency/Firm (Requesting Review): Wil Chee - Planning & Environmental

Contact: Celia Shen
Phone: 596-4688 Fax: 597-1851 E-Mail: cshen@wcphawaii.com
Address: 1018 Palm Drive, Honolulu, HI 96814

Title of Report/Plan: Archaeological Assessment Survey of the Connections Charter School Kaumana Property, South Hilo District, Island of Hawaii

Island: Hawaii District: South Hilo Ahupua`a: Ponohawai
TMK [(1) 1-1-001:001]: (3) 2-5-006:141

Submitted Plan/Report Fee & Type: (All reports or plans submitted to the SHPD for review shall be accompanied by the appropriate fee in accordance with HAR §13-275-4 and §284-4).

		Indicate here (X) if report is a re-submittal (no fee charged)
x	$50	Archaeological Assessment
	$150	Archaeological Inventory Survey Plan
	$450	Archaeological, Architectural or Ethnographic Survey Report
	$150	Preservation Plan
	$25	Monitoring Plan
	$150	Archaeological Data Recovery Plan
	$250	Burial Treatment Plan
	$100	Archaeological Monitoring Report, if resources reported
	$450	Archaeological Data Recovery Report
	$450	Ethnographic Documentation Report
	$25	Burial Disinterment Report
	$50	Osteological Analysis Report

Fee Total: $ 50

Make check payable to "Hawai`i Historic Preservation Special Fund." A service charge of $15 will be assessed on all dishonored checks pursuant to HRS §40-35.5" A copy of this form will be mailed or faxed back to you and will serve as your receipt.

RECEIVED
HISTORIC PRES. DIV.
DEPT. OF LAND &
NATURAL RESOURCES
2010 AUG 19 A 9:01

For Office Use Only:

Date Received: 19 AUG.2010	Receipt No.: 2964
Log. No.: 2010.3028	Payment Method: Cash $ 50.00 Check: ✓ Check No.: 1686 Receipt Issued by: C Treasury Deposit Receipt No:

STATE OF HAWAII

OFFICIAL RECEIPT

No. 2964

STATE HISTORIC PRESERVATION DIVISION

Department or Agency

DATE: 7 SEPT. 20 10

RECEIVED from WIL CHEE - PLANNING & ENVIRONMENTAL

Fifty and 00/100 DOLLARS

Archaeological Assessment survey of the Connections Charter School Kaumana Property. Ponohawai, South Hilo, Hawaii Island.

TMK (3)2-5-006:141 Check # 1686

$ 50.00

Authorized Signature

STATE ACCOUNTING FORM B-24
July 1, 1999 (Revised)

Appendix I
Traffic Impact Assessment Report

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@hawiiantel.net

June 28, 2010

Ms. Celia Shen
Wil Chee - Planning & Environmental, Inc.
1018 Palm Drive
Honolulu, HI 96814

Re: **Traffic Impact Analysis Report**
Connections School
Hilo, Hawaii
TMK: (3) 2-5-6:141

Dear Celia:

Phillip Rowell and Associates have completed the following Traffic Impact Assessment Report (TIAR) for the proposed Connections School in the Kaumana area of Hilo. The report is presented in the following format:

A. Project Location and Description
B. Purpose and Objective of Study
C. Methodology
D. Description of Existing Streets and Intersection Controls
E. Existing Peak Hour Traffic Volumes
F. Level-of-Service Concept
G. Existing Levels-of-Service
H. Background Traffic Projections
I. Project Trip Generation
J. Background Plus Project Traffic Projections
K. Traffic Impact Analysis
L. Mitigation
M. Other Traffic Related Issues
N. Summary and Conclusions

A. Project Location and Description

The proposed project is located in the Kaumana area of Hilo as shown on Attachment A.

The proposed school will be developed in six phases with full development completed in 2022. The development phases are summarized in Table 1.

Table 1 Summary of Development Plan By Phase

Phase	Description	Start Construction	Completion Year (1)
1	Initiate Agricultural Program	2011	2011
2	Begin Dormitory, Caretaker's Residence, Barn and Greenhouses	2012	2013
3	Begin High School	2013	2014
4	Begin Elementary and Middle Schools	2015-2018	2019
5	Construct Gymnasium	2019	2020
6	Construct Pre-Kindergarten Facilities	2021	2022

Notes:
(1) As completion dates for the phases were not provided, it was assumed that construction would be completed in approximately 12 months after start of construction.

There are three alternative development plans (Alternatives A, B and C) and a preferred alternative. All development plans divide the campus into a Lower Campus, north of Edita Street, and an Upper Campus, south of Edita Street.

Alternative 1

Alternative 1 is referred to as the "Consolidated Campus Layout" and a schematic drawing of the layout is provided as Attachment B. Under Alternative 1, the Lower Campus consists of the caretaker's residence and agricultural program facilities. Primary access to and egress from the project will be via the intersection of Kaumana Drive at Edita Street. Access and egress for the Lower Campus is provided by a driveway along the north side of Edita Street. This driveway is referred to as Road 'A.' The Upper Campus consists of the educational facilities, which include the dorms, elementary, middle and high schools, pre-kindergarten and gymnasium. Access and egress is provided via a driveway along the south side of Edita Street, referred to as Drive 'B.' This driveway should be aligned with the driveway serving the Lower Campus.

Alternative 2

Alternative 2 is referred to as the "Split Campus Layout." A schematic drawing of this alternative is provided as Attachment C. Under Alternative 2, the high school, dorms and agricultural facilities will be located on the Lower Campus and the elementary school, intermediate school and gymnasium will be located on the Upper Campus. Primary access to and egress from the project will be via the intersection of Kaumana Drive at Edita Street. Access to and egress from the Lower Campus will be provided by a new driveway referred to as Road "A." Access to and egress from the Upper Campus will be provided by a new driveway referred to as Road "C." Road "C" is a semi-circular driveway intersecting Edita Street approximately 150 feet east of Kaumana Drive and approximately 800 feet east of Kaumana Drive. The second intersection is aligned with Drive "A" that serves the Lower Campus. As the nearest intersection with Edita Street nearest Kaumana Drive overlaps with the existing westbound left turn lane, use of this driveway should be restricted to right turns in and right turns out only.

Alternative 3

Alternative 3 is a variation of Alternative 2 as shown on Attachment D. The Lower Campus and the Upper Campus consists of the components described as Alternative 2 and there are two driveways along Edita Street serving the Upper Campus. In addition, there is a fourth driveway along Kaumana Drive at the north end of the project. To minimize the impacts of this driveway on traffic along Kaumana Drive and to address sight distance issues, use of this driveway should be restricted to right turn in and right turns out only.

Preferred Alternative

The Preferred Alternative is shown on Attachment E. No major school facilities are proposed for the upper parcel. A walkway is being proposed for the upper parcel to provide access and viewing opportunities within the forested area. This walkway is the only structure being proposed for the upper parcel. All major school facilities are now proposed to be located within the lower parcel. Access and egress will be provided via a new driveway along the north side of Edita Street. This driveway is referred to as Road "D." All traffic movements will be allowed at this driveway.

B. Purpose and Objective of Study

1. Quantify and describe the traffic related characteristics of the proposed project.

2. Identify potential deficiencies adjacent to the project that will impact traffic operations in the vicinity of the proposed project.

C. Methodology

1. *Define the Study Area*

The first step in defining the study area was to estimate the number of peak hour trips that the proposed project will generate. Based on a review of studies for other projects in the area, it was determined that the study area should include the intersection of Kaumana Drive at Edita Street and the project driveways along Edita Street and Kaumana Drive. The study intersections are summarized in Table 2.

Table 2 Intersections Studies for Each Alternative

	Existing	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative
Kaumana Drive at Edita Street	X	X	X	X	X
Edita Street at Road "A" & "B"		X		X	
Edita Street at Road "A" & "C"			X		
Edita Street at Road "C" (West)			X	X	
Kaumana Drive at Road "B"				X	
Edita Drive at Road "D"					X

2. *Analyze Existing Traffic Conditions*

Existing traffic volumes at the study intersections were estimated from manual traffic counts performed Thursday, May 28, 2009. The intersection configuration and right-of-way controls were verified during a field reconnaissance of the study area during April, 2009. Existing traffic operating conditions of the study intersection were determined using the methodology described in the 2000 *Highway Capacity Manual* (HCM)[1].

3. *Estimate Horizon Year Background Traffic Projections*

Background traffic conditions are defined as future traffic conditions without the proposed project. The design horizon year does not necessarily represent the project completion date of that phase. It is a date for which future background traffic projections were estimated. For this project, we have used a design, or horizon, year of 2022. Horizon year background traffic conditions were estimated using a background traffic growth factor.

4. *Estimate Project-Related Traffic Characteristics*

The number of peak-hour trips that the proposed project will generate was estimated using standard trip generation procedures outlined in the *Trip Generation Handbook*[2] and data provided in *Trip Generation*[3]. These trips were distributed and assigned, based on the available approach and departure routes and trip distribution data from other recently completed traffic studies in the area.

5. *Analyze Project Related Traffic Impacts*

The project-related traffic was then superimposed on background traffic volumes. The traffic impacts of the project were assessed by analyzing the changes in peak hour traffic volumes and changes in the levels-of-service at the study intersections. The purpose of this analysis was to identify potential operational deficiencies in the vicinity of the proposed project.

D. Description of Existing Streets and Intersection Controls

The existing lane configurations and right-of-way controls are summarized in Attachment F.

[1] *Highway Capacity Manual*, Institute of Transportation Engineers, Washington, D.C., 2000

[2] *Trip Generation Handbook*, Institute of Transportation Engineers, Washington, D.C., 1998

[3] *Trip Generation*, Institute of Transportation Engineers, Washington, D.C., 2003

E. Existing Peak Hour Traffic Volumes

Because schools have a midday peak hour in addition to the typical morning and afternoon peak hours, the midday peak period was also counted and analyzed. The existing morning, midday and afternoon peak hour traffic volumes for the existing intersection of Kaumana Drive at Edita Street are summarized in Attachment G.

Traffic counts for the intersection of Kaumana Drive at Edita Street were performed Thursday, May 28, 2009. The number of vehicles making each movement at the intersections was recorded at 15-minute intervals. The counts include mopeds, buses, trucks and other large vehicles. No pedestrian activity was noted during the traffic counts.

As there are no intersections and only a few driveways along Edita Street between the intersection of Kaumana Drive and the proposed driveways serving the project, the peak hourly traffic volumes of the remaining intersections were calculated from the traffic volumes counted at the intersection of Kaumana Drive at Edita Street.

F. Level-of-Service Concept

"Level-of-service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 1. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. LOS D is typically considered acceptable for peak hour conditions in urban areas.

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics, such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 2 summarizes the definitions for level-of-service and the corresponding delay.

Table 1 Level-of-Service Definitions for Signalized Intersections[1]

Level of Service	Interpretation	Volume-to-Capacity Ratio[2]	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Table 2 Level-of-Service Definitions for Unsignalized Intersections[1]

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

G. Existing Levels-of-Service

The existing levels-of-service of the intersections are summarized in Table 3. Since all the study intersections are unsignalized, only the delays and levels-of-service of the controlled movements at the study intersections are recorded. The HCM methodology does not calculate volume-to-capacity ratios for unsignalized intersections.

Table 3 Existing Levels-of-Service

Intersection, Approach and Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
Kaumana Drive at Edita Street						
Southbound Left & Thru	7.8	A	7.6	A	7.5	A
Westbound Left	10.9	B	10.4	B	10.7	B
Westbound Right	9.8	A	9.2	A	8.9	A

NOTES:
1. V/C ratio is not calculated for unsignalized intersections.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual.* LOS is based on delay.

The conclusion of the level-of-service analysis is that all movements operate at Level-of-Service A or B. This implies good operating conditions, minimal delays and high levels-of-service.

H. Background Traffic Projections

Background traffic projections are defined as future background traffic conditions without the proposed project. Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This background growth rate will also compensate for any small development projects that are not identified as a related project. The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

Background Growth

Based on reconnaissance of the study area and information provided by WCP, it was concluded that future traffic growth along Kaumana Drive is expected to be minimal. This is because the surrounding area is relatively built out and the pertinent section of Kaumana Drive is expected to be used by local traffic only. Regional traffic will most likely use Puainako Street Extension as it provides a much higher level-of-service and will therefore result in shorter travel times for motorists.

In order to consider minimal growth along Kaumana Drive in the vicinity of the project, a average annual growth rate of 1% per year was used to estimate future background traffic growth between 2009 and 2022. The growth factor was calculated to be 1.1381 using the following formula:

$$F = (1 + i)^n$$

where F = Growth Factor
i = Average annual growth rate, or 0.01
n = Growth period in years, or 13 years

The background traffic growth factor was applied to through traffic volumes along Kaumana Road. It was assumed that there would be no traffic growth of traffic along Edita Street.

Related Projects

The second component in estimating future background traffic volumes is traffic resulting from other proposed projects in the vicinity. Related projects are defined as those projects that are likely to be constructed within or adjacent to the study project and would significantly impact traffic in the study area. Related projects may be development projects or roadway improvements. No related projects were identified.

2022 background traffic projections were calculated by expanding existing traffic volumes by the appropriate growth rates and then superimposing traffic generated by related projects. The resulting 2022 background peak hour traffic projections are shown as Attachment H.

I. Project Trip Generation

Future traffic volumes generated by a project are typically estimated using the methodology described in the *Trip Generation Handbook*[4] and data provided in *Trip Generation*[5]. This method uses trip generation rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street.

The trip generation analysis for each phase of the project is discussed separately

Phase 1 - 2011

Phase 1 is the agricultural facilities. It is understood that this consists of a barn and storage facilities only. Peak hour traffic is considered minimal.

Phase 2 - 2013

Phase 2 involves construction of the caretaker's residence and dormitories. It was assumed that the caretaker's residence would be a single-family residence. Based on trip generation data provided in Trip Generation, a single-family detached residence will generate one trip during the morning peak hour and one trip during the afternoon peak hour.

It is understood that students living in the dormitories be will bused between the project site and the existing school site in Hilo. Based on information provided by the Client, there will be eight trips per day, four trips during the morning and four trips during the midday. Half of these trips will be during the peak hour. It was also assumed that the buses will be staged at the proposed site in order to assess a worse-case scenario. This means that four buses will drive students to school in the morning and then return to the campus. During the midday peak hour, these buses will be driven into Hilo to pick up the students and then return to the campus.

[4] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

[5] Institute of Transportation Engineers, *Trip Generation, 7th Edition,* Washington, D.C., 2003

Using these assumptions, there will be two inbound and two outbound trips during both the morning and afternoon peak hours.

Phase 3 - 2014

Phase 3 involves construction of the high school. High school enrollment will be 107 students. *Trip Generation*[6] contains trip generation data for high schools. The rates and trip generation calculations are summarized in Table 4. The trip generation rates are based on the number of students.

Table 4 Trip Generation Calculations for High School (Phase 3)

Time Period	Direction	Rate or %[(1)]	Students	Trips
Weekday	Total	1.71	107	183
AM Peak Hour	Total	0.41		44
	In	69%		30
	Out	31%		14
Midday Peak Hour	Total	0.28		30
	In	32%		10
	Out	68%		20
PM Peak Hour	Total	0.14		15
	In	47%		7
	Out	53%		8

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

Phase 4 - 2019

Phase 4 involves construction of the elementary (K-6) and intermediate schools (7-8). There will be 167 students in the K thru 6 school 107 students in the intermediate school. *Trip Generation*[7] contains trip generation data for K-6 school and intermediate schools. The rates and trip generation calculations are summarized in Table 5. The trip generation rates are based on the number of students.

[6] Institute of Transportation Engineers, *Trip Generation 7th Edition*, Washington, D.C., 2003, pg. 920 thru 923

[7] Institute of Transportation Engineers, Trip Generation 7th Edition, Washington, D.C., 2003, pg. 901 thru 919

Table 5 Trip Generation Calculations Elementary & Intermediate Schools (Phase 4)

Time Period	Direction	Elementary School			Intermediate School			Totals
		Rate or %[(1)]	Students	Trips	Rate or %[(1)]	Students	Trips	
Weekday	Total	1.29	167	215	1.62	107	173	
AM Peak Hour	Total	0.42		70	0.53		57	127
	In	55%		39	55%		31	70
	Out	45%		31	45%		26	57
Midday Peak Hour	Total	0.28		47	0.30		32	79
	In	45%		21	45%		14	35
	Out	55%		26	55%		18	44
PM Peak Hour	Total	0.15		25	0.15		16	41
	In	52%		13	52%		8	21
	Out	48%		12	48%		8	20

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

Phase 5 - 2020

Phase 5 is the construction of the gymnasium. The gymnasium will be used by Connections' students during the day. All events that will have spectators will be schedule during off-peak traffic periods. Therefore, there is no peak hour traffic assocaited with the gymnasium other that typical traffic associated with a middle or high school.

Phase 6 - 2022

Phase 6 is the pre-kindergarten facilities. There are no trip data provided for pre-kindergarten schools. Trip data for elementary schools were used. The resulting trip generation estimates are summarized in Table 6.

Table 6 Trip Generation Calculations for Pre-Kindergarten Facility (Phase 6)

Time Period	Direction	Rate or %[(1)]	Students	Trips
Weekday	Total	1.29	25	32
AM Peak Hour	Total	0.42		11
	In	55%		6
	Out	45%		5
Midday Peak Hour	Total	0.28		7
	In	45%		3
	Out	55%		4
PM Peak Hour	Total	0.15		4
	In	52%		2
	Out	48%		2

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

Total Project

Table 7 is a summary of the trip generation estimates for the total project. As shown the proposed project will generate 108 inbound and 79 outbound trips during the morning peak hour, 52 inbound trips and 72 outbound trips during the midday peak hour and 31 inbound and 30 outbound trips during the afternoon peak hour.

Table 7 Trip Generation for Total Project

Time Period	Direction	Number of Trips Generated By						Total Project Trips
		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
Weekday	Total	0	18	183	388	0	32	621
AM Peak Hour	Total	0	5	44	127	0	11	187
	In	0	2	30	70	0	6	108
	Out	0	3	14	57	0	5	79
Midday Peak Hour	Total	0	4	34	79	0	7	124
	In	0	2	12	35	0	3	52
	Out	0	2	22	44	0	4	72
PM Peak Hour	Total	0	1	15	41	0	4	61
	In	0	1	7	21	0	2	31
	Out	0	0	8	20	0	2	30

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

The project generated traffic was distributed and assigned based on the assumption that 50 percent of the traffic would approach from and depart toward the south (toward Wilder Road) and that 50 percent would approach from and depart toward the north (Hilo). This distribution assumes that project generated traffic from area areas other that Hilo would use Puainako Street Extension and then backtrack in order to minimize travel times.

The project trip assignments are shown in Attachment I for Alternative 1, Attachment J for Alternative 2, Attachment K for Alternative 3 and Attachment L for the Preferred Alternative.

J. Background Plus Project Projections

Background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street. This represents a worse-case condition, as it assumes that the peak hours of all the intersection approaches and the peak hours of the study project all coincide. The resulting background plus project traffic projections are shown as Attachments M thru P.

K. Traffic Impact Analysis

The impact of the project was assessed by analyzing the changes in the levels-of-service at the study intersections.

1. The *Highway Capacity Software* (HCS) package was used to perform level-of-service analyses. This package uses the *Highway Capacity Manual* methodology.

2. As the *Highway Capacity Manual* defines level-of-service by delay, we have used the same definitions.

3. The 2022 lane configurations used in the level-of-service analysis are shown as Attachment Q.

The results of the level-of-service analysis are summarized in Attachment R. Shown are the average vehicle delays and levels-of-service. Existing delays and levels-of-service are also shown for comparison. The conclusions of the level-of-service analysis are that all the controlled movements at the study intersections will operate at Level-of-Service A or B, which implies high levels-of-service and very good operating conditions both without and with project generated traffic.

M. Mitigation

We have used the Institute of Transportation Engineers standard that a Level-of-Service D is the minimum acceptable level-of-service and that the criteria is applicable to the overall intersection. If project generated traffic causes the level-of-service to drop below Level-of-Service D, resulting in Level-of-Service E or F, then mitigation should be provided to improve the level-of-service to Level-of-Service D or better.

Based on this criteria, no mitigation is required at the study intersections as a result of project generated traffic. All controlled traffic movements are expected to operate at Level-of-Service A or B, which are the highest levels-of-service. This implies that delays should be minimal and operation should also be good.

N. Other Traffic Related Issues

Regional Traffic Impact

It is understood that students and employees of the proposed project will travel destinations over a wide area and will use major regional roadways, such as Puainako Street Extension and Kaumana Drive. Considering the heavy traffic volumes on these roadways and relatively small number of trips that the project will generate, the proposed project will have a minimal impact on the regional transportation system, especially at locations beyond the immediate vicinity of the project.

Public Transportation

Hele On has a bus route along Kaumana Drive. See Attachment S. Hele On should be contacted relative to providing a bus stop on the campus for both students and employees.

O. Summary and Conclusions

The conclusions of the traffic impact assessment are:

1. The proposed project will generate 108 inbound and 79 outbound trips during the morning peak hour, 52 inbound trips and 72 outbound trips during the midday peak hour and 31 inbound and 30 outbound trips during the afternoon peak hour.

2. Based on the results of the level-of-service, all controlled traffic movements are expected to operate at better than acceptable levels-of-service and no additional mitigation measures are recommended at this time.

3. It is very likely that some families will have more than one student at the school which means that more than one student may be dropped off and picked up by one vehicle. The Institute of Transportation Engineers trip generation rates do not provide data to estimate the number of these trips. Therefore, the number of trips estimated for the total development plan is probably over estimated. There is insufficient data to quantify this overestimate.

4. The trip generation analysis, and therefore, the level-of-service analysis, is based on trip generation data provided in *Trip Generation*, which in the accepted standard for traffic impact studies. The data may, or may not, reflect traffic conditions in the study area. Therefore, it is recommended that traffic surveys be performed upon completion and occupancy of Phase3, Phase 4 and Phase 6 to confirm the trip generation analysis and that the study intersections are operating as predicted. If these surveys determine that additional mitigation measures are needed, the appropriate improvements should be identified and implemented.

5. The school should develop a traffic management plan and appoint a staff member as a transportation coordinator. The objective of the traffic management plan is to promote ride sharing and use of alternative modes of transportation such as buses and carpools by students and employees.

6. The level-of-service analysis concluded that the project driveways along Edita Street will operate at acceptable levels-of-service without separate left turn lanes. However, school related vehicles turning left into the project will cause delays to through traffic along Edita Street unless separate left turn lanes are provided. To minimize the impact of project related traffic on through traffic, it is recommended that a separate left turn lane be provided for left turns from eastbound Edita Street into the Lower Campus at Road A.

7. Alternative modes of transportation within the project should be encouraged. Alternative modes of transportation for internal trips include bicycles, golf carts, etc. Adequate parking facilities for these alternative modes should be provided.

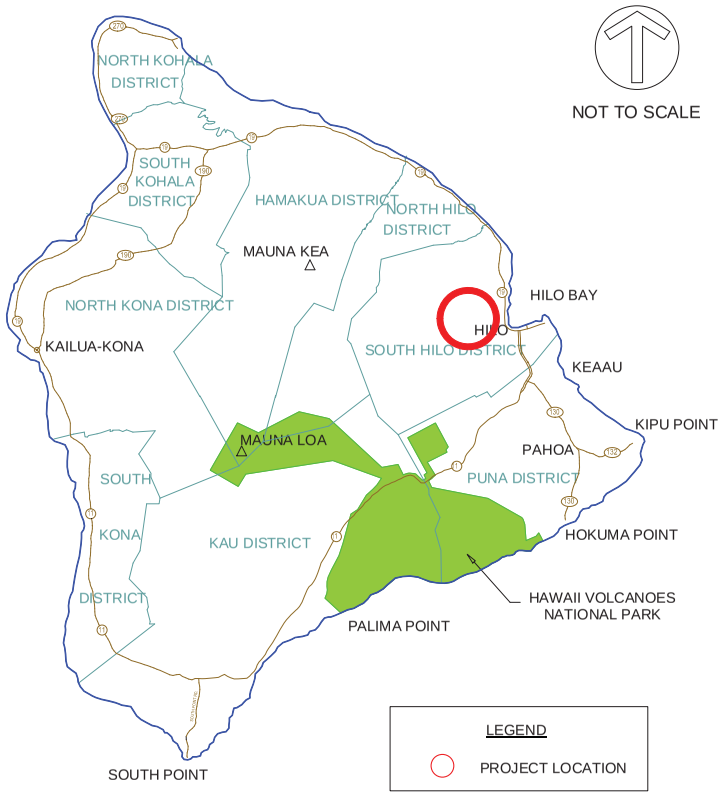
8. Hele On should be contacted regarding the feasibility of providing bus service to and from the project.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

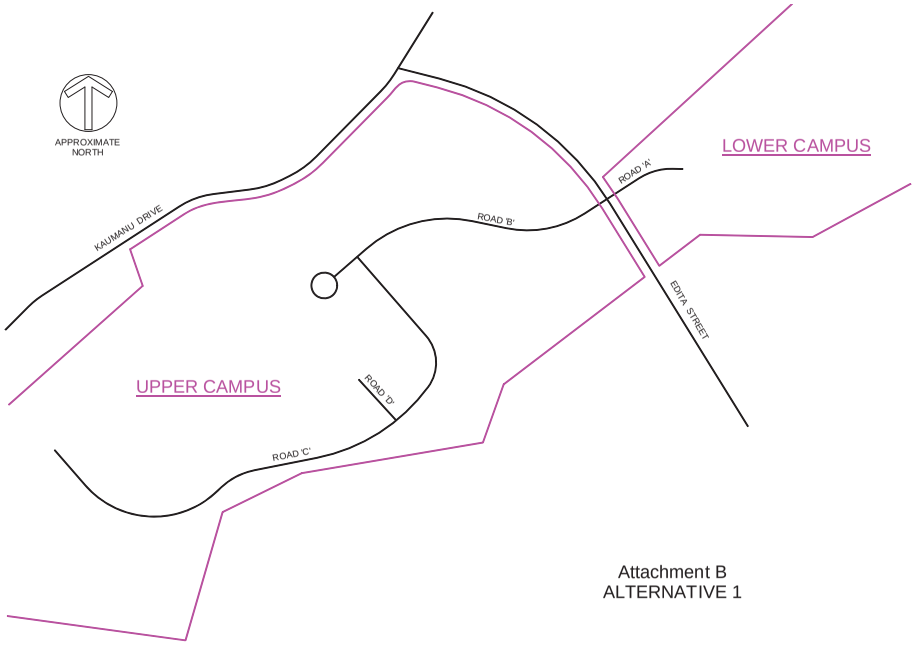
Phillip J. Rowell, P.E.
Principal

List of Attachments

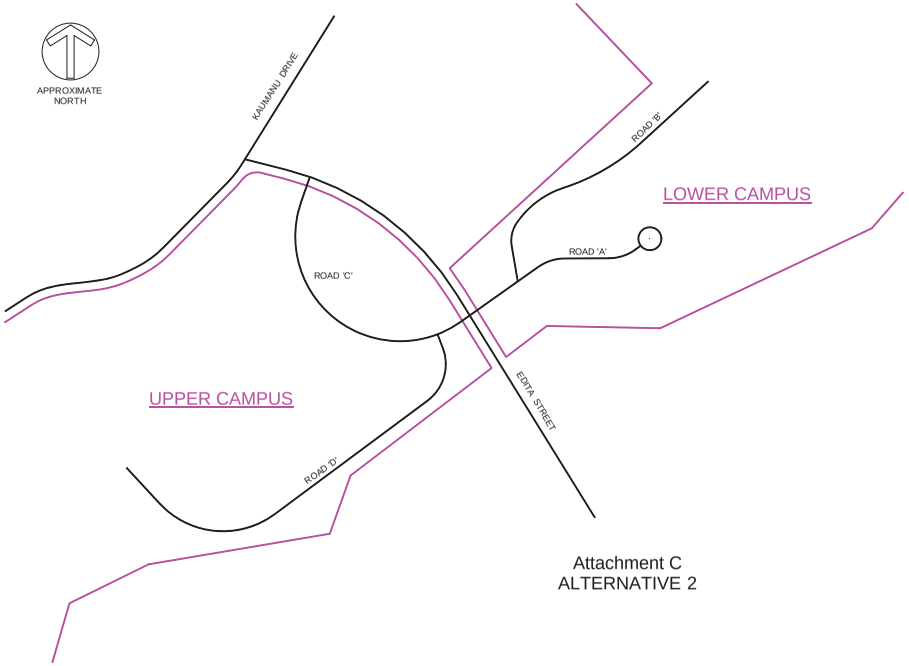
A. Project Location Map
B. Alternative I
C. Alternative 2
D. Alternative 3
E. Preferred Alternative
F. Existing Lane Configurations and Right-of-Way Controls
G. Existing Peak Hour Traffic Volumes
H. 2022 Background Peak Hour Traffic Projections and Levels-of-Service
I. Project Trip Assignments for Alternative 1
J. Project Trip Assignments for Alternative 2
K. Project Trip Assignments for Alternative 3
L. Project Trip Assignments for Preferred Alternative
M. 2022 Background Plus Project Peak Hour Traffic Projections Alternative 1
N. 2022 Background Plus Project Peak Hour Traffic Projections Alternative 2
O. 2022 Background Plus Project Peak Hour Traffic Projections Alternative 3
P. 2022 Background Plus Project Peak Hour Traffic Projections Preferred Alternative
Q. 2022 Lane Configurations and Right-of-Way Controls
R. 2022 Levels-of-Service
S. Hele On Bus Service in Study Area



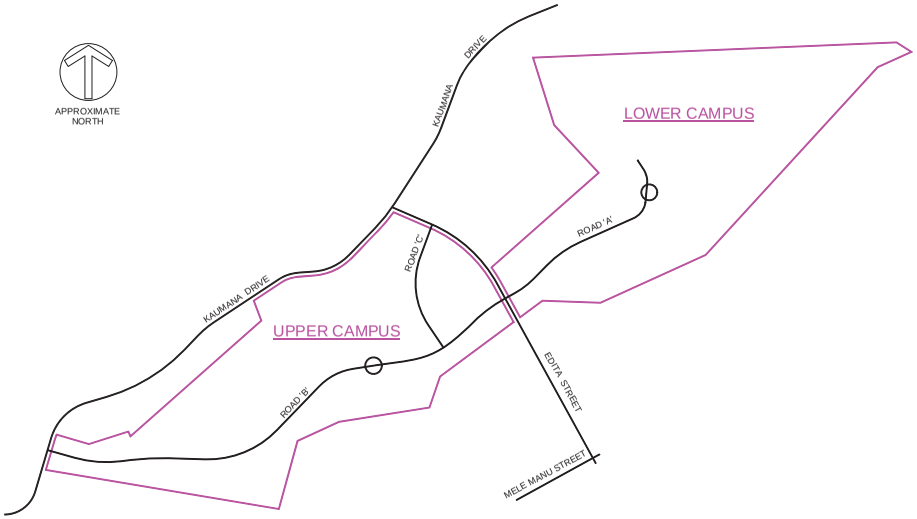
Attachment A
PROJECT LOCATION ON HAWAII



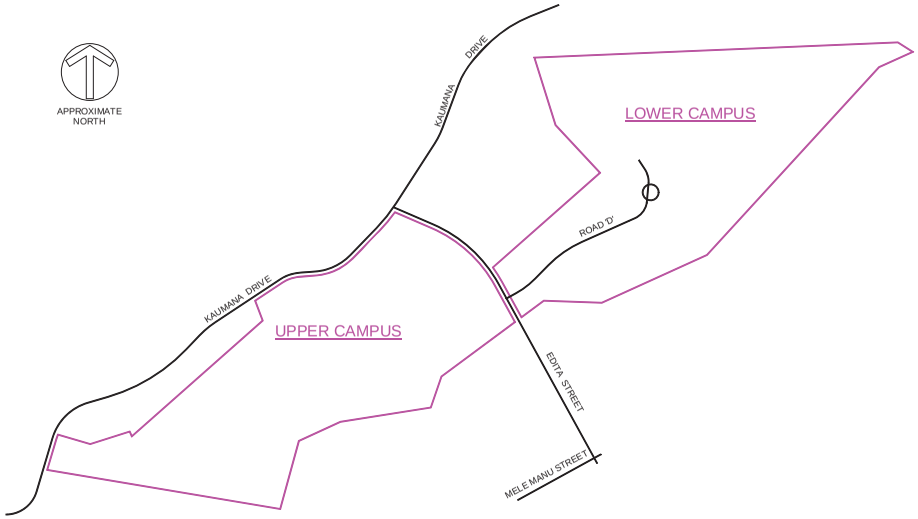
Attachment B
ALTERNATIVE 1



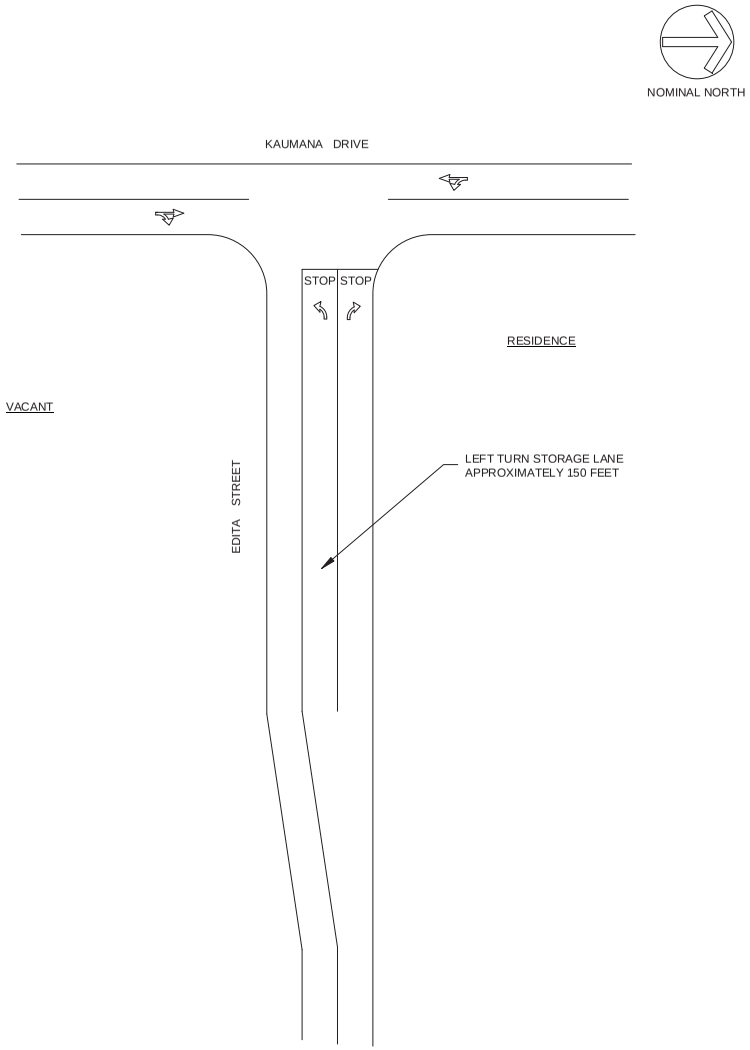
Attachment C
ALTERNATIVE 2



Attachment D
ALTERNATIVE 3



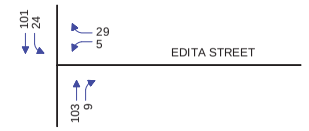
Attachment E
PREFERRED ALTERNATIVE



Attachment F
EXISTING LANE CONFIGURATIONS AND RIGHT-OF-WAY CONTROLS

Approach	Delay	LOS
SB LT	7.8	A
WB L	10.9	B
WB R	9.8	A

EXISTING AM PEAK HOUR
(Approx. 7:00 AM to 8:00 AM)



Approach	Delay	LOS
SB LT	7.6	A
WB L	10.4	B
WB R	9.2	A

EXISTING MIDDAY PEAK HOUR
(Approx. 2:00 PM to 3:00 PM)

Approach	Delay	LOS
SB LT	7.5	A
WB L	10.7	B
WB R	8.9	A

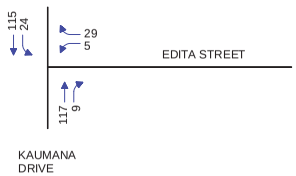
EXISTING PM PEAK HOUR
(Approx. 4:30 PM to 5:30 PM)

NOTE:
TRAFFIC COUNTS WERE PERFOMRED
THURSDAY, MAY 28, 2009.

Attachment G
EXISTING PEAK HOUR TRAFFIC VOLUMES
AND EXISTING LEVELS-OF-SERVICE

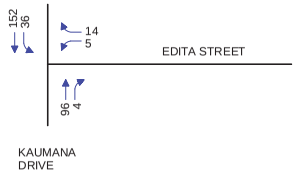
Approach	Delay	LOS
SB LT	7.8	A
WB L	11.2	B
WB R	10.0	A

2022 AM PEAK HOUR



Approach	Delay	LOS
SB LT	7.6	A
WB L	10.5	B
WB R	9.2	A

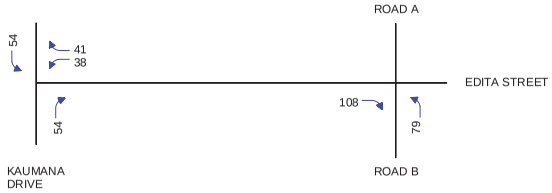
2022 MIDDAY PEAK HOUR



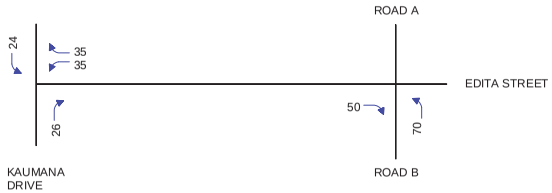
Approach	Delay	LOS
SB LT	7.5	A
WB L	10.8	B
WB R	9.0	A

2022 PM PEAK HOUR

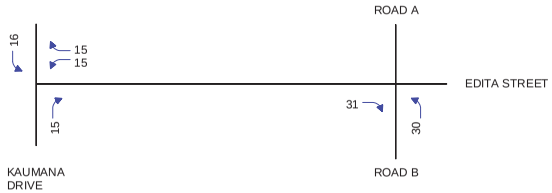
Attachment H
2022 PEAK HOUR TRAFFIC VOLUMES
AND LEVELS-OF-SERVICE



2021 AM PEAK HOUR

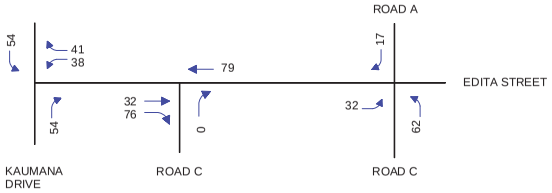


2021 MIDDAY PEAK HOUR

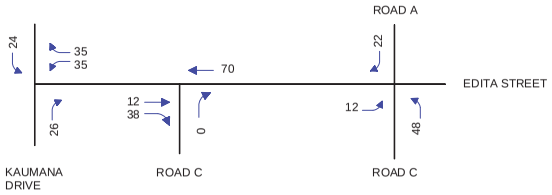


2021 PM PEAK HOUR

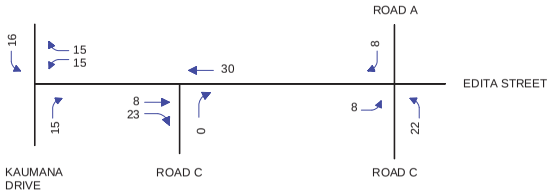
Attachment I
PROJECT TRIP ASSIGNMENTS FOR ALTERNATIVE 1



2021 AM PEAK HOUR

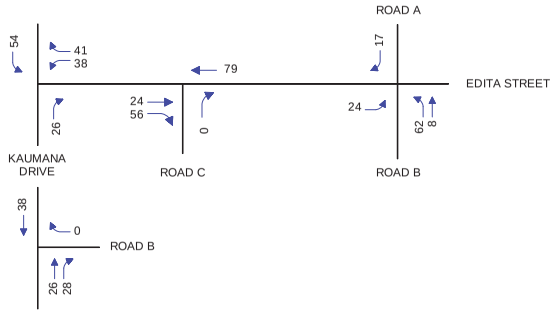


2021 MIDDAY PEAK HOUR

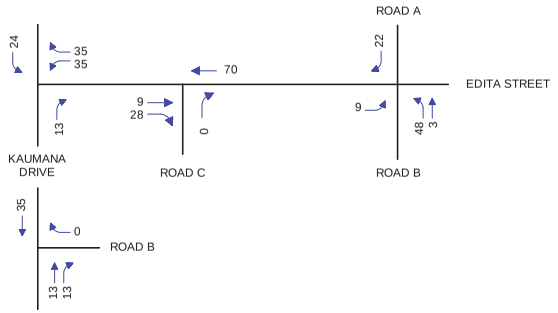


2021 PM PEAK HOUR

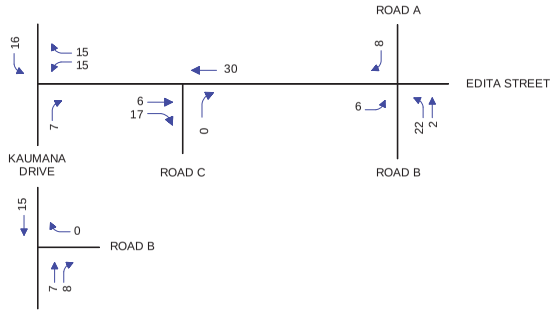
Attachment J
PROJECT TRIP ASSIGNMENTS FOR ALTERNATIVE 2



2021 AM PEAK HOUR

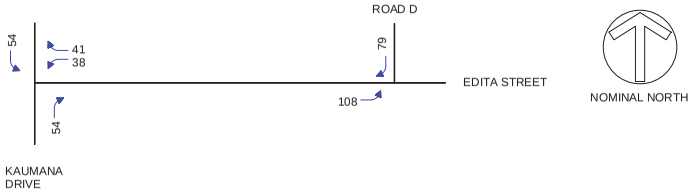


2021 MIDDAY PEAK HOUR

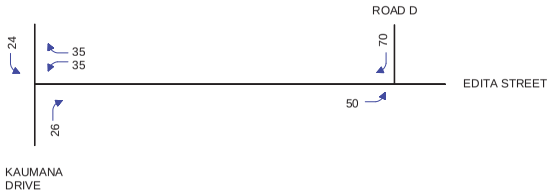


2021 PM PEAK HOUR

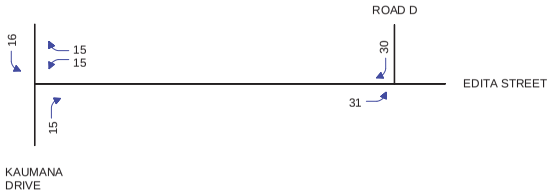
Attachment K
PROJECT TRIP ASSIGNMENTS FOR ALTERNATIVE 3



2021 AM PEAK HOUR

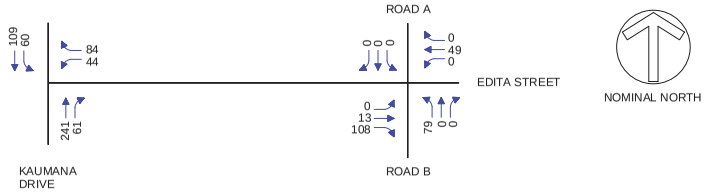


2021 MIDDAY PEAK HOUR



2021 PM PEAK HOUR

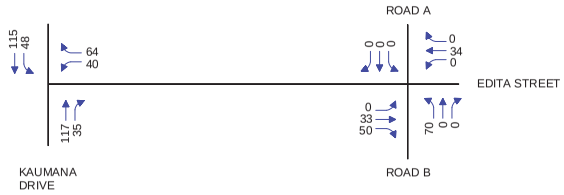
Attachment L
PROJECT TRIP ASSIGNMENTS FOR PREFERRED ALTERNATIVE



Approach	Delay	LOS
SB LT	8.2	A
WB L	14.3	B
WB R	10.7	B

Approach	Delay	LOS
EB LTR	7.4	A
WB LTR	7.5	A
NB LTR	10.0	B
SB LTR	8.6	A

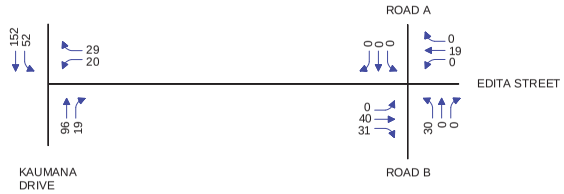
2022 AM PEAK HOUR



Approach	Delay	LOS
SB LT	7.8	A
WB L	11.9	B
WB R	9.7	A

Approach	Delay	LOS
EB LTR	7.3	A
WB LTR	7.5	A
NB LTR	9.8	A
SB LTR	8.5	A

2022 MIDDAY PEAK HOUR

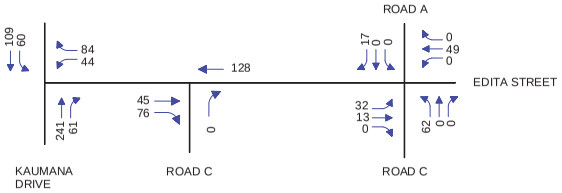


Approach	Delay	LOS
SB LT	7.7	A
WB L	11.6	B
WB R	9.2	A

Approach	Delay	LOS
EB LTR	7.3	A
WB LTR	7.4	A
NB LTR	9.3	A
SB LTR	8.5	A

2022 PM PEAK HOUR

Attachment M
2022 BACKGROUND PLUS PROJECT PEAK HOUR TRAFFIC PROJECTIONS
FOR ALTERNATIVE 1

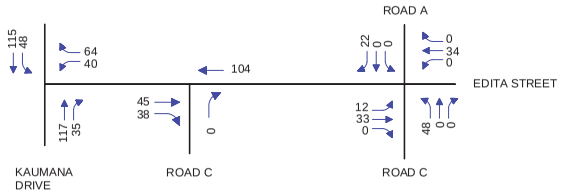


Approach	Delay	LOS
SB LT	8.1	A
WB L	14.1	B
WB R	10.6	B

Approach	Delay	LOS
NB R	8.8	A

Approach	Delay	LOS
EB LTR	7.4	A
WB LTR	7.3	A
NB LTR	10.3	B
SB LTR	8.7	A

2022 AM PEAK HOUR

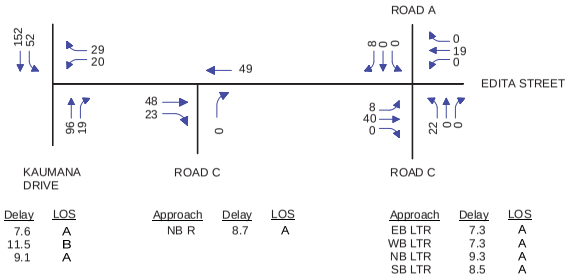


Approach	Delay	LOS
SB LT	7.7	A
WB L	11.7	B
WB R	9.6	A

Approach	Delay	LOS
NB R	8.7	A

Approach	Delay	LOS
EB LTR	7.4	A
WB LTR	7.3	A
NB LTR	9.9	A
SB LTR	8.6	A

2022 MIDDAY PEAK HOUR



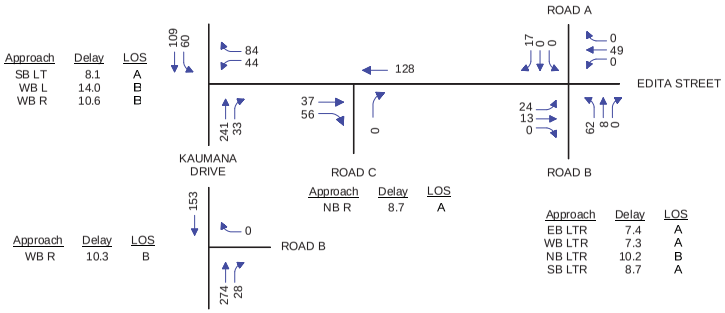
Approach	Delay	LOS
SB LT	7.6	A
WB L	11.5	B
WB R	9.1	A

Approach	Delay	LOS
NB R	8.7	A

Approach	Delay	LOS
EB LTR	7.3	A
WB LTR	7.3	A
NB LTR	9.3	A
SB LTR	8.5	A

2022 PM PEAK HOUR

Attachment N
2022 BACKGROUND PLUS PROJECT PEAK HOUR TRAFFIC PROJECTIONS
FOR ALTERNATIVE 2



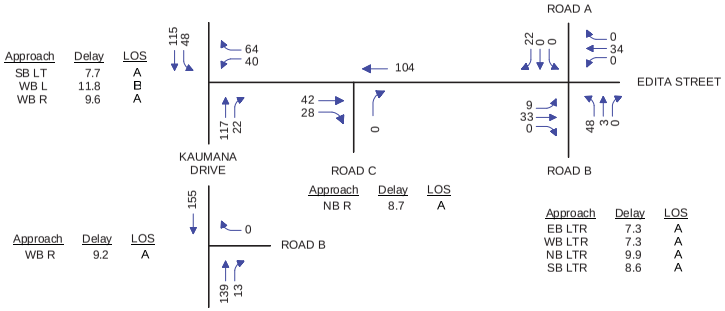
Approach	Delay	LOS
SB LT	8.1	A
WB L	14.0	B
WB R	10.6	B

Approach	Delay	LOS
NB R	8.7	A

Approach	Delay	LOS
EB LTR	7.4	A
WB LTR	7.3	A
NB LTR	10.2	B
SB LTR	8.7	A

Approach	Delay	LOS
WB R	10.3	B

2022 AM PEAK HOUR



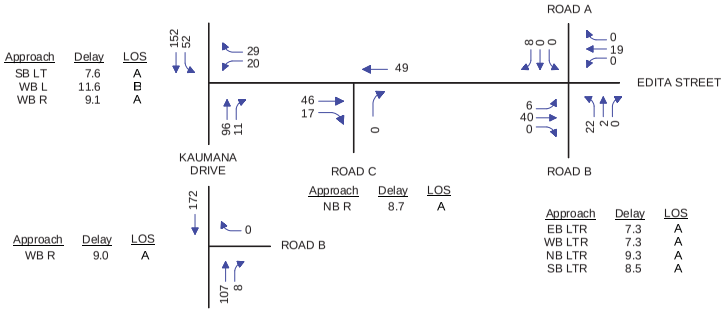
Approach	Delay	LOS
SB LT	7.7	A
WB L	11.8	B
WB R	9.6	A

Approach	Delay	LOS
NB R	8.7	A

Approach	Delay	LOS
EB LTR	7.3	A
WB LTR	7.3	A
NB LTR	9.9	A
SB LTR	8.6	A

Approach	Delay	LOS
WB R	9.2	A

2022 MIDDAY PEAK HOUR



Approach	Delay	LOS
SB LT	7.6	A
WB L	11.6	B
WB R	9.1	A

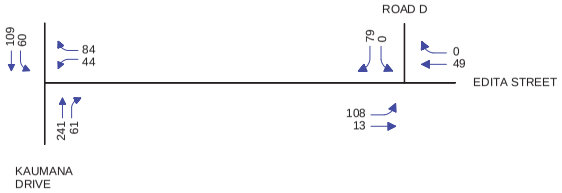
Approach	Delay	LOS
NB R	8.7	A

Approach	Delay	LOS
EB LTR	7.3	A
WB LTR	7.3	A
NB LTR	9.3	A
SB LTR	8.5	A

Approach	Delay	LOS
WB R	9.0	A

2022 PM PEAK HOUR

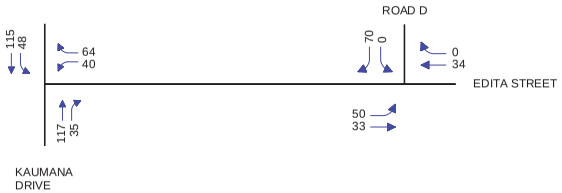
Attachment O
2022 BACKGROUND PLUS PROJECT PEAK HOUR TRAFFIC PROJECTIONS
FOR ALTERNATIVE 3



Approach	Delay	LOS
SB LT	8.2	A
WB L	14.3	B
WB R	10.7	B

Approach	Delay	LOS
EB LT	7.6	A
SB LR	9.0	A

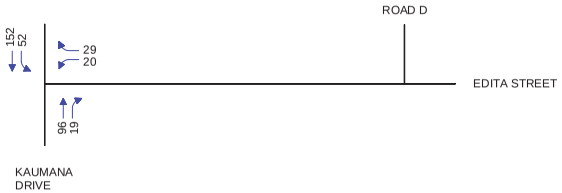
2022 AM PEAK HOUR



Approach	Delay	LOS
SB LT	7.8	A
WB L	11.9	B
WB R	9.7	A

Approach	Delay	LOS
EB LT	7.4	A
SB LR	8.9	A

2022 MIDDAY PEAK HOUR

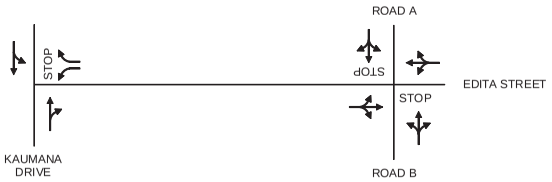


Approach	Delay	LOS
SB LT	7.7	A
WB L	11.6	B
WB R	9.2	A

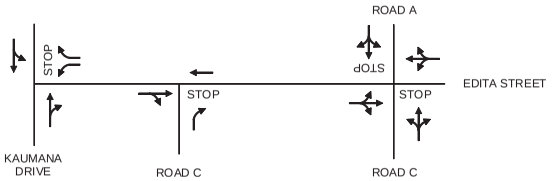
Approach	Delay	LOS
EB LT	7.4	A
SB LR	8.6	A

2022 PM PEAK HOUR

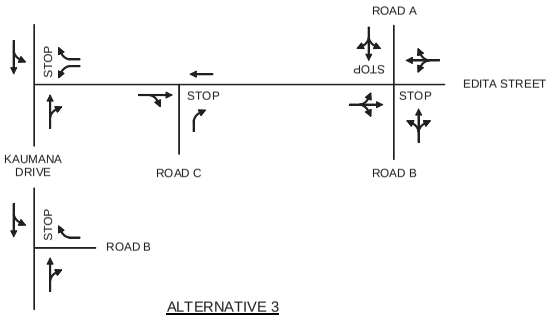
Attachment P
2022 BACKGROUND PLUS PROJECT PEAK HOUR TRAFFIC PROJECTIONS
FOR PREFERRED ALTERNATIVE



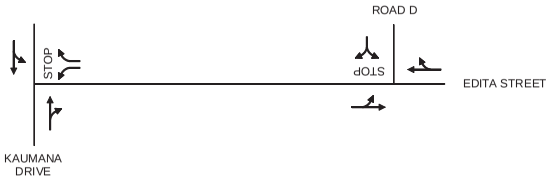
ALTERNATIVE 1



ALTERNATIVE 2



ALTERNATIVE 3



PREFERRED ALTERNATIVE

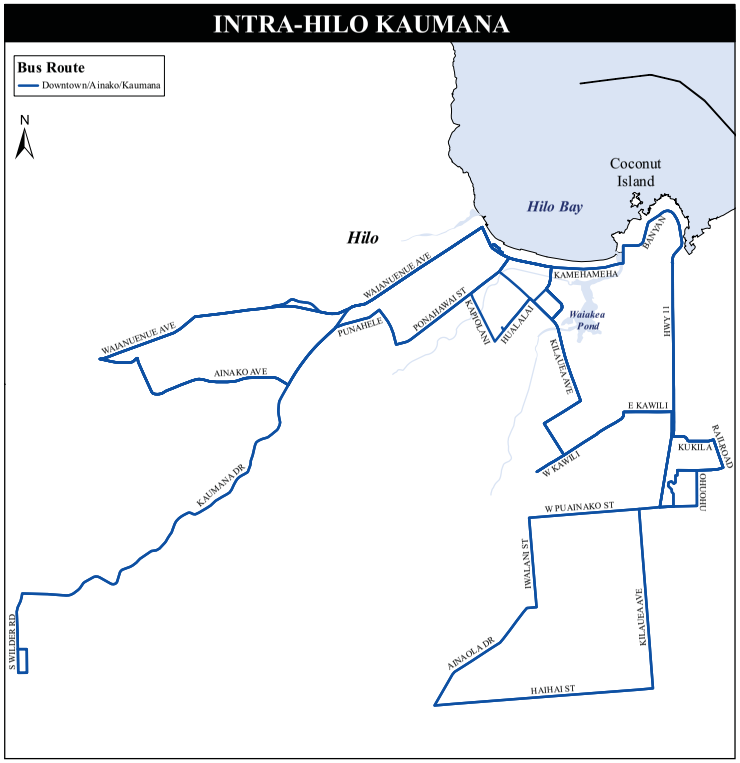
Attachment Q
2021 LANE CONFIGURATION AND
RIGHT-OF-WAY CONTROLS

Attachment R
2022 Peak Hour Levels-of-Service

Approach and Movement	Existing (2009) Delay[2]	Existing (2009) LOS[3]	2021 Background Delay	2021 Background LOS	2022 Alternative 1 Delay	2022 Alternative 1 LOS	2022 Alternative 2 Delay	2022 Alternative 2 LOS	2022 Alternative 3 Delay	2022 Alternative 3 LOS	2021 Preferred Alternative Delay	2021 Preferred Alternative LOS
AM Peak Hour [1]												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.8	A	7.8	A	8.2	A	8.1	A	8.1	A	8.2	A
Westbound Left	10.9	B	11.2	B	14.3	B	14.1	B	14.0	B	14.3	B
Westbound	9.8	A	10.0	B	10.7	B	10.6	B	10.6	B	10.7	B
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.4	A	7.4	A	7.4	A		
Westbound Left, Thru & Right					7.5	A	7.3	A	7.3	A		
Northbound Left, Thru & Right					10.0	B	10.3	B	10.2	B		
Southbound Left, Thru & Right					8.6	A	8.7	A	8.7	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.8	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		10.3	B		
Edita Street at Road D												
Eastbound left & Thru											7.6	A
Southbound Left & Right											9.0	A
Midday Peak Hour												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.6	A	7.6	A	7.8	A	7.7	A	7.7	A	7.8	A
Westbound Left	10.4	B	10.5	B	11.9	B	11.7	B	11.8	B	11.9	B
Westbound	9.2	A	9.2	A	9.7	A	9.6	A	9.6	A	9.7	A
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.3	A	7.4	A	7.3	A		
Westbound Left, Thru & Right					7.5	A	7.5	A	7.3	A		
Northbound Left, Thru & Right					9.8	A	9.9	A	9.9	A		
Southbound Left, Thru & Right					8.5	A	8.6	A	8.6	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.7	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		9.2	A		
Edita Street at Road D												
Eastbound left & Thru											7.4	A
Southbound Left & Right											8.9	A
PM Peak Hour												
Kaumana Drive at Edita Street												
Southbound Left & Thru	7.5	A	7.5	A	7.7	A	7.6	A	7.6	A	7.7	A
Westbound Left	10.7	B	10.8	B	11.6	B	11.5	B	11.6	B	11.6	B
Westbound	8.9	A	9.0	A	9.2	A	9.1	A	9.1	A	9.2	A
Edita Street at Road A												
Eastbound Left, Thru & Right	See Note 4		See Note 4		7.4	A	7.3	A	7.3	A		
Westbound Left, Thru & Right					7.3	A	7.3	A	7.3	A		
Northbound Left, Thru & Right					9.9	A	9.3	A	9.3	A		
Southbound Left, Thru & Right					8.5	A	8.5	A	8.5	A		
Edita Street at Road C												
Northbound Right	See Note 4		See Note 4		See Note 4		8.7	A	8.7	A		
Kaumana Drive at Road B												
Westbound Right	See Note 4		See Note 4		See Note 4		See Note 4		9.0	A		
Edita Street at Road D												
Eastbound left & Thru											7.4	A
Southbound Left & Right											8.6	A

NOTES:
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the project.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.
4. This intersection will be constructed as part of the project

Attachment S
HELE ON BUS SERVICE IN STUDY AREA



COUNTY OF HAWAII
MASS TRANSIT AGENCY
961-8744
INTRA-HILO KAUMANA
BUS SCHEDULE
Operates Monday-Saturday

In consideration of others and for your safety:

1. Shirts and footwear are required.
2. No flammable, explosive or toxic material.
3. No smoking, consumption of food or beverage.
4. Discarding of litter.
5. Expectorating or spitting.
6. The playing of radios, tape players, dvd players, and cell phones are prohibited without headphones.
7. Refrain from horseplaying, yelling or talking loudly.
8. The following items are prohibited unless prior permission is granted:
   a. Bodyboards
9. **$1.00 charge for pets (except service animals) provided they are kept in an enclosed container or cage.**
10. **$1.00 charge per item larger than 16" x 18"or more than one item that cannot fit underneath your seat. $1.00 charge for bicycle.**
11. Please utilize designated bus stop zones whenever possible.

How to board the bus:

1. Wait on the proper side of the roadway for the bus.
2. Flag the bus (please call for bus stop information).
3. Wait until the bus makes a complete stop.
4. Boarding will be denied if passengers appear to be intoxicated on liquor or drugs; engaged in activities that violate any other law or ordinance.

How to exit the bus:

1. Before reaching your desired "get off" spot, pull cord located by the window of the bus.
2. Remain seated until the bus comes to a complete stop.
3. Exit from front of bus.

DISCLAIMER: The County of Hawaii will not be responsible for any inconvenience, expense, or damages resulting from the failure to depart or arrive at stated times or for any items brought on the bus.

For more information visit www.heleonbus.org

County of Hawaii is an Equal Opportunity Employer and Provider

INTRA-HILO BUS SCHEDULE
Operates Monday through Saturday
Effective 1/04/08

DOWNTOWN HILO TO AINAKO & KAUMANA (Bus is marked "4 DOWNTOWN HILO")

Prince Kuhio Plaza	Aupuni Center	Banyan Drive	Mooheau Bus Terminal	Kawaena Lapaau	Hilo Library	Hilo Medical Center	Ainako & Kaumana	Chong & Kaumana	Gentry Subdivision
7:15	**7:25**	---	**7:35**	---	**7:40**	**7:45**	**7:50**	---	---
---	---	**8:30**	**8:35**	---	**8:40**	**8:45**	**8:50**	---	---
9:40	---	**10:00**	**10:05**	---	**10:10**	**10:15**	**10:25**	---	---
11:15	---	**11:30**	**11:35**	---	**11:40**	**11:45**	**11:50**	---	---
---	2:15	---	2:20	---	2:25	2:30	2:35	2:40	2:45

AINAKO & KAUMANA TO DOWNTOWN HILO (Bus in marked "7 DOWNTOWN HILO")

Gentry Subdivision	Chong & Kaumana	Kaumana Terrace	Ainako	Hilo Library	Kawaena Lapaau	Mooheau Bus Terminal	Aupuni Center	Prince Kuhio Plaza	Banyan Drive
---	---	---	**7:50**	**7:55**	---	**8:00**	**8:05**	---	---
---	---	---	**8:50**	---	**9:00**	**9:05**	**9:10**	**9:25**	**10:00**
---	---	---	**10:20**	---	**10:30**	**10:35**	**10:40**	**10:55**	**11:30**
---	---	---	**11:50**	---	12:00	12:05	12:10	12:25	1:10
2:45	2:50	2:55	---	3:00	---	3:05	3:10	3:23	---

BOLD = MORNINGS