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

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

July 17, 2013
Honolulu, Hawaii

Application for Stream Channel Alteration Permit (SCAP.3818.8)
Riverside Apartments Improvements Stream Bank Bluff Protection and Stabilization
Wailuku River, Hilo, Hawaii (TMK: (3) 2-6-003:009)

APPLICANT:
UHC 00382 Hilo, L.P.,
A Hawaii Limited Partnership
2000 E. Fourth Street, Suite 205
Santa Ana, CA 92705

LANDOWNER:
Big Island Housing Foundation Riverside
Community Based Non-Profit Corp.
Yukio Takeya, President
688 Kinoole Street, Suite 212
Hilo, Hawaii 96720

SUMMARY OF REQUEST:

This Stream Channel Alteration Permit (SCAP.3818.8) Application follows up the previously approved SCAP 2868.8 emergency work to stabilize and protect a different Second Level stream bank bluff to prevent the embankment from failing. An embankment failure could threaten the structural integrity of the apartment building and possibly jeopardize the safety of its residents. A geotechnical engineering study recommends the improvements proposed here.

The Riverside Apartments are an affordable rental complex. The U.S. Department of Housing and Urban Development required the project owners to complete the stream bank stabilization improvements or risk the loss of federal operating subsidies. Without this financial assistance, the owner could not afford to operate the rental housing complex which would result in the loss of 74 units of affordable rental housing.

LOCATION: See Exhibit 1.

BACKGROUND:

In 2008, heavy rains caused a slope failure (landslide) of a portion of the Third Level terrace where the building is close to the slope. Fortunately, the 2008 slope failure did not result in

E2

direct building distress. The proposed improvements are similar to the earlier emergency bank stabilization on the Third Level of the Riverside Apartments property.

On April 20, 2011, the Commission on Water Resource Management ("Commission") approved SCAP 2868.8 for emergency stream bank protection and stabilization on the same property upstream of the current project area. (Exhibit 1).

In July 2011, emergency repairs were completed to protect and stabilize the failed portion of the stream bank. During the design and construction of the earlier emergency project, an older slope scarp on the Second Level (the current project area) was also identified. A geotechnical investigation (including a topographic survey of the stream bank, a reconnaissance of the slope scarp, exploratory borings and a geophysical survey) found the stream bank slope in the current project area to be "marginally stable" under unsaturated/static loading conditions. It concluded that the slope is likely to become unstable under prolonged heavy rains, stream flooding, or in the event of an earthquake. Because of the close proximity of the apartment building to the steep embankment, a landslide in this area could cause severe structural damage to the apartment building and possibly endanger its tenants.

On May 8, 2013, the Office of Environmental Quality Control published the finding of no significant impact for the Riverside Apartments Improvements Final Environmental Assessment in its Environmental Notice.

On May 22, 2013, the Commission received a completed SCAP application from the Applicant's consultant Kimura International, Inc. ("Consultant"). On June 3, 2013, the Applicant and Consultant 's letter and SCAP application was received by the Commission, initiating the process for agency review.

DESCRIPTION:

Wailuku River is a perennial stream with a watershed area of 252 square miles and a total stream length of 196 miles. Native crustaceans and fish are located in the estuary, middle and upper reaches and headwaters of Wailuku River.

The proposed project will protect and stabilize a steep stream bank slope behind the Riverside Apartments located at 333 Ohai Street, Hilo, Hawaii (Exhibits 1 and 2). The Riverside Apartment complex is a four-story, L-shaped building constructed in 1973. It provides 74 units of subsidized housing to qualified low-income tenants through the support of the U.S. Department of Housing and Urban Development. The proposed work will occur on the bank at or above 6.0 feet mean sea level (MSL), as well as at the level area at the top of the stream bank. In this area, the mean higher high water mark is 1.25 feet.

The Riverside Apartment complex is situated on a three-level terraced stream bank fronting Ohai Street on the north and bordered by the Wailuku River on the south, along the rear of the apartment complex. The property sits on a bluff above the river and is terraced in the east to west direction. The lowest of the three terraces, known as the First Level, is on the easternmost side of the parcel, near Puueo Street. The Third Level, which is situated at the highest elevation,

is located on the western most side of the parcel. The proposed stream bank bluff protection and stabilization will be on the Second Level of the property.

The objective of the proposed action is to stabilize and protect the Second Level stream bank bluff in order to prevent a failure of the embankment (Exhibit 3). An embankment failure could threaten the structural integrity of the apartment building and possibly jeopardize the safety of its residents. The proposed improvements are based on the recommendations of a geotechnical engineering study.

The project will install a series of soil nails and rock anchors to reinforce the steep embankment slope, and install an 8 to 10 inch thick layer of reinforced shotcrete (gunite) over the slope to protect and stabilize the slope face. The toe of the embankment will be protected against future erosion, scour and undermining by a cutoff wall. At the top of the slope, the project will pave the level area between the upper limits of the shotcrete and the building. As a redundant measure to protect the building, a series of micropiles will be installed to underpin the building nearest the stream bank. An 8-foot high chain link fence will be installed along the top of the bank to limit access down the improved slope. The project area shown in Exhibit 1 covers approximately 5,270 square feet in area, and is bounded by two existing retaining walls. The proposed improvements will be similar to the emergency stabilization for the Third Level completed in 2011.

As shown in Exhibit 4, the work will occur in two areas: 1) Embankment Area will be protected and stabilized, and 2) Underpin the building foundation with micropiles in Level Area to provide redundant protection in the area where the building is closest to the steep slope.

Embankment Area. In order to stabilize the stream embankment, a series of soil nails and rock anchors will be drilled into the steep slope face at various angles. (Exhibit 5). Soil nailing is a common construction technique used as a remedial measure to treat unstable natural slopes. The 4.5 inch in diameter soil nails generally consist of steel elements (bars or strands) grouted in a drilled hole, to provide lateral or vertical force to resist movement of the slope face. The bars are typically installed into pre-drilled holes and then grouted into place. The rock anchors consist of the same elements, but are installed into the rock outcrop. It is estimated that approximately 109 soil nails and 21 rock anchors will be required within an estimated 3,000 square foot area of the embankment. The soil nails will be installed to a depth of 30 to 40 feet. The rock anchors will be installed at the upstream and downstream ends of the slope toe, and each one will be installed to a 10 to 20 foot depth. (Exhibits 5 and 6).

In addition, an 8 to 10 inch thick layer of reinforced shotcrete (gunite) will be installed up and over the stream bank to protect and stabilize the slope face. As discussed in the final geotechnical report, the shotcrete will overlap existing rock outcrops at the upstream and downstream edges of the second level slope area. The shotcrete facing will include a geocomposite subdrain system to relieve groundwater that may collect behind the slope face. A concrete pigment will be added to the shotcrete to color it an earth tone, to blend with the natural rocks, as was done at the Third Level. At the bottom limits of the shotcrete, a cutoff wall will be installed. The wall will be excavated to a depth of five feet or to rock, whichever is less. This will protect against scour caused by turbulent stream flow during heavy rain storms.

Construction for the project is estimated to take approximately three to six months to complete. All work will occur on the level area of the site or the stream bank slope above 6.0 feet MSL. No work will be done below the mean higher high water mark of Wailuku River. Construction equipment will not be staged below the mean higher high water level (1.25 feet).

During construction, best management practices will be used to ensure that there are no adverse impacts to the water quality of Wailuku River. Sandbags or a silt fence will be installed during the construction period to prevent rocks, soil, vegetation and other debris from entering the river. The location of the sandbags or silt fence is shown in the site plan. It will be placed below the work area, but above the mean higher high water mark of the river.

Underpin the Building Foundation with Micropiles in Level Area. In this Second Level area, the building's shallow spread foundations are located as close as 10 to 11 feet from the edge of the embankment. The project will underpin the building's shallow foundations with micropiles in areas where the building is closest to the slope as a means to provide redundant support for the building in the event of slope movements due to more extreme events such as very a large earthquake. The underpinning will be accomplished by installing a series of ten micropiles along the edge of the building in the level area at the top of the slope. The micropiles are a high strength central reinforcing bar encased in cement grout within a galvanized steel casing, approximately 6 to 8 inches in outer diameter.

As shown in Exhibit 7, the micropiles will be structurally connected directly to the continuous wall footings, and installed to a depth of approximately 45 feet in order to support the required load. After installation of the micropiles, the level area at the top of the stream bank will be paved in order to provide additional support and minimize ground saturation which could further destabilize the embankment. An 8-foot high by 150 foot long chain link fence with two 4-foot wide gates will be installed along the top of the bank to limit access down the improved/protected slope.

ANALYSIS:

Agency Review Comments:

Department of Health, Clean Water Branch (DOH-CWB):

1. The project is subject to Chapters 11-54 Water Quality Standards, and 11-55 Water Pollution Control, Hawaii Administrative Rules. The project is subject to the Clean Water Act, Section 401.

DLNR, Aquatic Resources: No objections.

DLNR, Forestry and Wildlife: No objections.

DLNR, Land Division: No objections.

DLNR, Division of State Parks: No objections.

Hawaii County Planning Department: The subject parcel is in the Special Management Area (SMA) and is subject to review. Due to the emergency nature of the request, the Planning Department issued an SMA Emergency Permit on June 28, 2013, for the stabilization of the stream bank slope.

Hawaii Revised Statutes (HRS) Chapter 343, Environmental Review

Environmental Assessment (EA) Triggers. According to Section 343-5, HRS, an EA is required for actions that propose the use of state or county lands or funds. The stream bank bluff protection and stabilization improvements are funded by federal and state tax credits and a loan from the State Housing Finance and Development Corporation's rental housing trust fund. A Finding of No Significant Impact was published in the May 8, 2013, Environmental Notice.

Staff Review

Haw. Rev. Stat. § 174C-71(3) gives the Commission on Water Resource Management (Commission) the responsibility to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses; and requires persons to obtain a permit from the Commission prior to undertaking a stream channel alteration.

The proposed work will occur on the bank at or above 6.0 feet MSL, as well as at the level area at the top of the stream bank. In this area, the mean higher high water mark is 1.25 feet. Best management practices include the installation of silt fences, debris catchment fences and sand bags along the stream bank to prevent debris from falling into the river. Approximately 27 to 37 cubic yards of dredge spoil from the soil nails, rock anchors, and micropiles will be collected and trucked off-site.

During the construction period, there is potential to impact to the Hawaiian hoary bat (*Lasiurus cinereus semotus*), or ʻopeʻapeʻa, an endangered species, during the clearing and grubbing phases of the embankment work. The removal of vegetation along the stream embankment may temporarily displace individual bats which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance is likely to be minimal. However, during the pupping season, females carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such a disturbance can be avoided or minimized by not clearing woody vegetation taller than 15 feet between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing. Therefore, clearing of vegetation will not commence until after October.

The estimated time of completion is three months. Therefore, staff expects no significant impacts to the Wailuku River.

RECOMMENDATION:

Approve a Stream Channel Alteration Permit (SCAP.3818.8) to install soil nails and rock anchors to reinforce the steep embankment slope, and install an 8 to 10 inch thick layer of reinforced shotcrete (gunite) over the slope to protect and stabilize the slope face. At the top of the slope, pave the level area between the upper limits of the shotcrete and the building. Install micropiles to underpin the building nearest the stream bank. Install an 8-foot tall chain link fence along the top of the bank to limit access down the improved slope on TMK (3) 2-6-003:009, subject to the standard conditions in Exhibit 8.

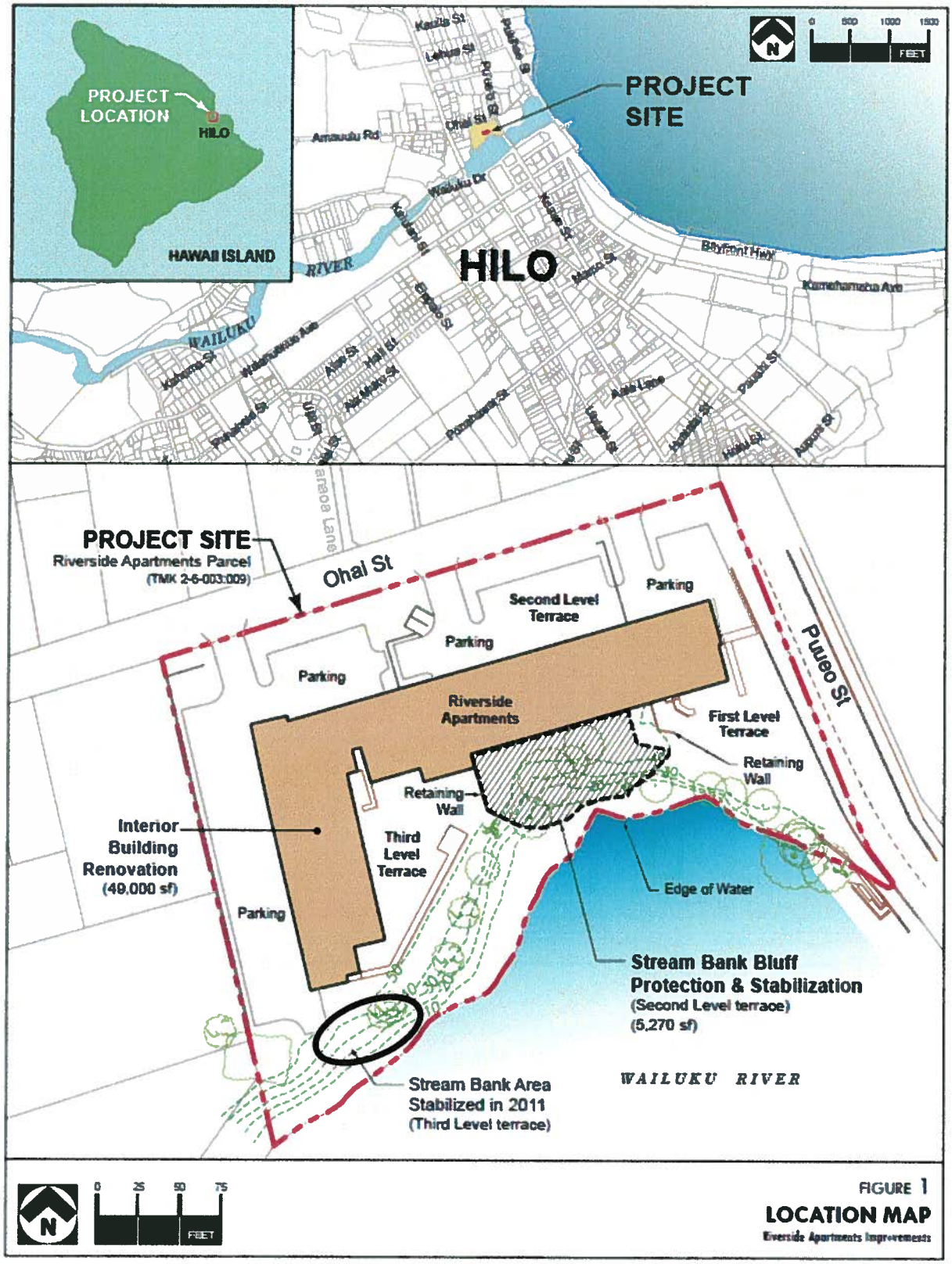
Respectfully submitted,

WILLIAM M. TAM
Deputy Director

Exhibits:
1. Location Map.
2. Aerial Photo of the Site.
3. Proximity of the Riverside Apartment Building to the Edge of the Embankment.
4. Site Plan: Stream Bank Bluff Protection and Stabilization.
5. Proposed Slope Stabilization and Protection (Section).
6. Examples of Soil Nail Installation.
7. Building Underpinning With Micropiles (Section).
8. Standard Stream Channel Alteration Permit Conditions.

APPROVED FOR SUBMITTAL:

WILLIAM J. AILA, JR.
Chairperson



Location Map.

EXHIBIT 1

Aerial Photo of the Site.

EXHIBIT 2

Proximity of the Riverside Apartment building to the edge of the embankment.

Upper middle portion of the slope.

EXHIBIT 3

Site Plan: Stream Bank Bluff Protection and Stabilization.

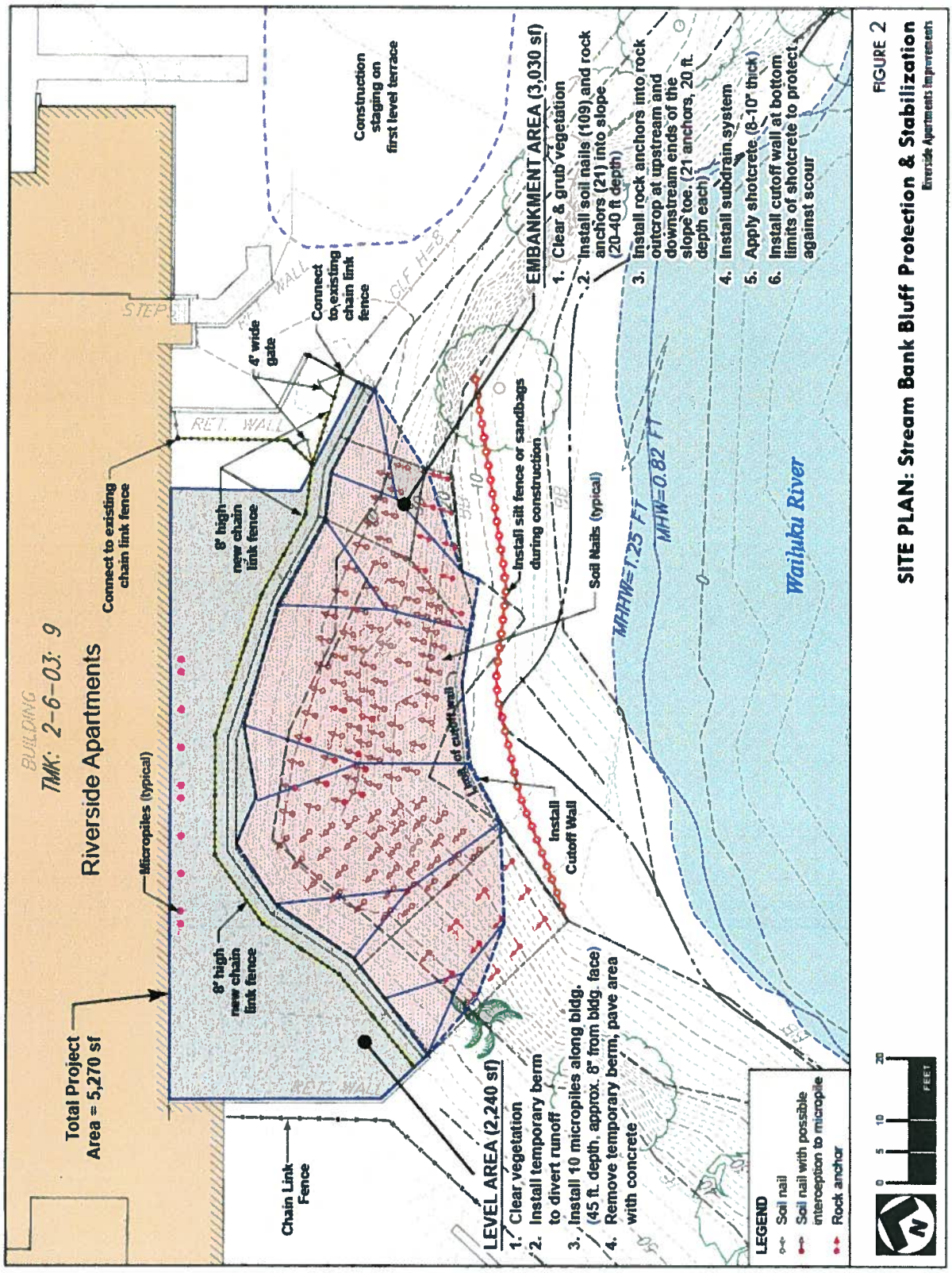


EXHIBIT 4

Proposed Slope Stabilization and Protection (Section)

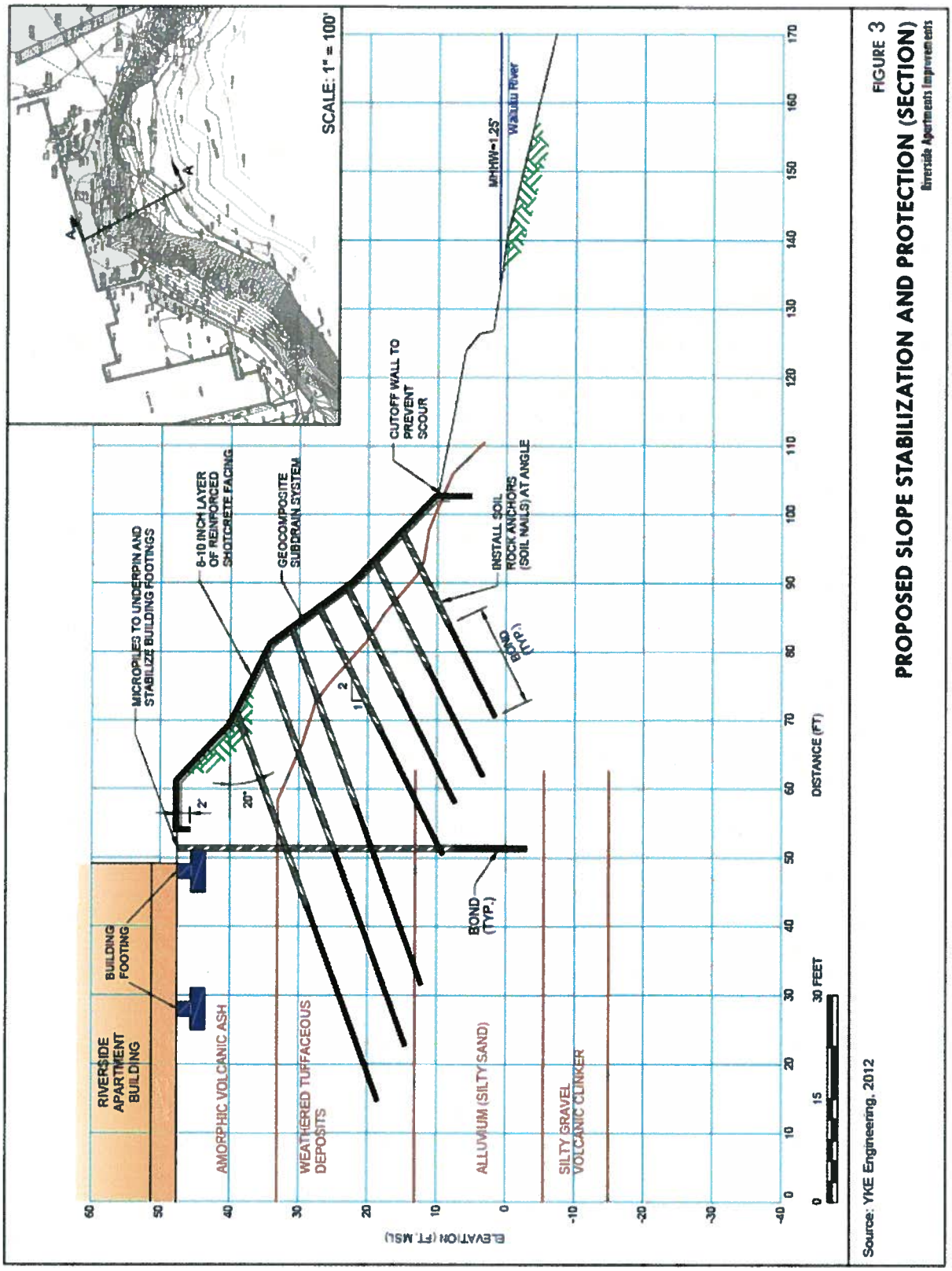
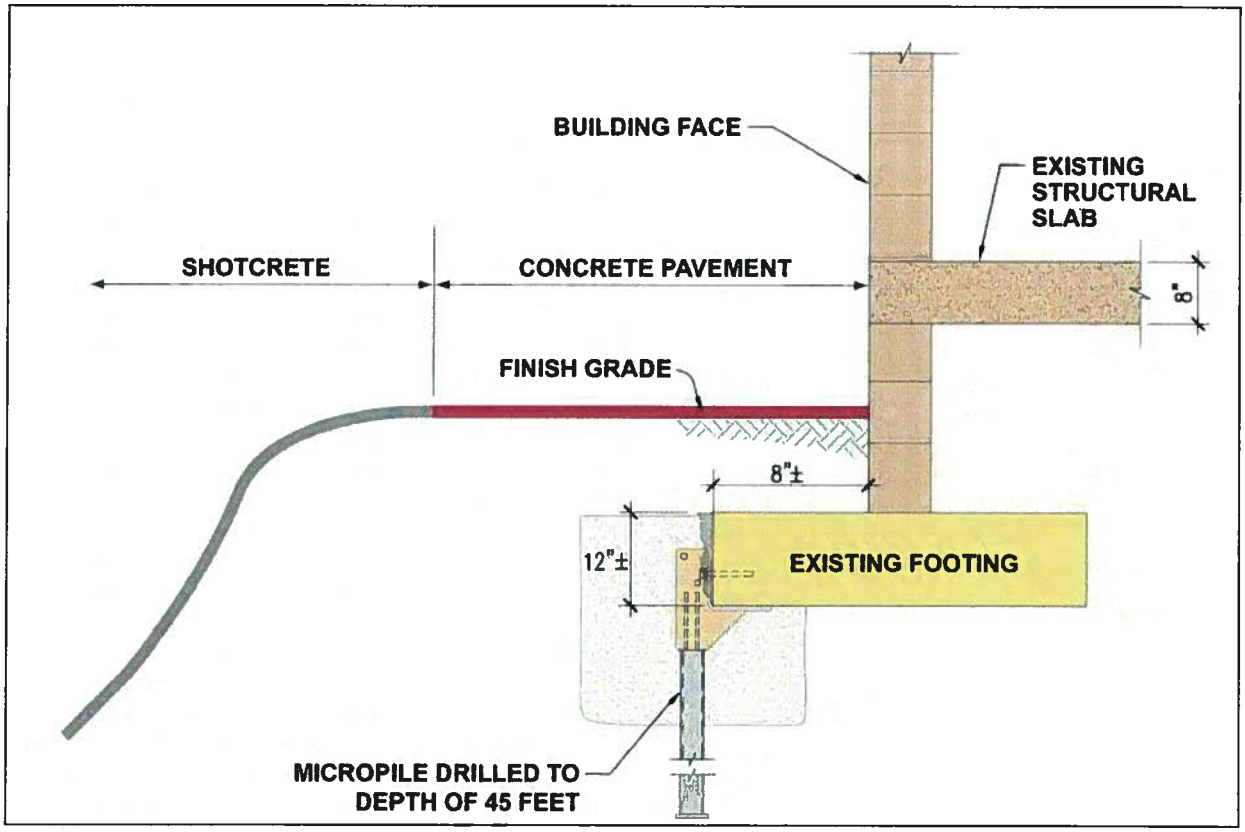


EXHIBIT 5

Examples of soil nail installation.

EXHIBIT 6



Building Underpinning with Micropiles (Section)

EXHIBIT 7

STANDARD STREAM CHANNEL ALTERATION PERMIT CONDITIONS
(Revised 9/19/07)

1. The permit application and staff submittal approved by the Commission at its meeting on July 17, 2013, shall be incorporated herein by reference.

2. The applicant shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and county governments.

3. The applicant, his successors, assigns, officers, employees, contractors, agents, and representatives, shall indemnify, defend, and hold the State of Hawaii harmless from and against any claim or demand for loss, liability, or damage including claims for property damage, personal injury, or death arising out of any act or omission of the applicant or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permit.

4. The applicant shall notify the Commission, by letter, of the actual dates of project initiation and completion. The applicant shall submit a set of as-built plans and photos of the completed work to the Commission upon completion of this project. This permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The proposed work under this stream channel alteration permit shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Commission upon showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

5. Before proceeding with any work authorized by the Commission, the applicant shall submit one set of construction plans and specifications to determine consistency with the conditions of the permit and the declarations set forth in the permit application.

6. The applicant shall develop site-specific, construction best management practices (BMPs) that are designed, implemented, operated, and maintained by the applicant and its contractor to properly isolate and confine construction activities and to contain and prevent any potential pollutant(s) discharges from adversely impacting state waters. BMPs shall control erosion and dust during construction and schedule construction activities during periods of low stream flow.

EXHIBIT 8

7. The applicant shall protect and preserve the natural character of the stream bank and stream bed to the greatest extent possible. The applicant shall plant or cover lands denuded of vegetation as quickly as possible to prevent erosion and use native plant species common to riparian environments to improve the habitat quality of the stream environment.

8. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the applicant shall stop work in the area of the find and contact the Department's Historic Preservation Division immediately. Work may commence only after written concurrence by the State Historic Preservation Division.