

## **Appendix G**

**Preliminary Engineering Report  
Kodani & Associates  
July 2017**

# PRELIMINARY ENGINEERING REPORT

*for*

## KEALIA RESIDENTIAL SUBDIVISION

JULY 11, 2017

KODANI & ASSOCIATES ENGINEERS, LLC

LIHUE, KAUA'I, HAWAI'I

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## **1. BACKGROUND INFORMATION**

### **1.1 PROPOSED PROJECT DESCRIPTION**

The proposed development, Kealia Residential Subdivision, is within the Kawaihau District on the Island of Kauaʻi. Kawaihau District extends from the Wailua River north to Moloaʻa, including the Kapaʻa-Wailua Basin, Kealia, and Anahola.

The Subject property is located east of Kapaʻa town, across Kuhio Highway from Kealia Beach Park. The property is currently one (1) large lot that is 1,075.6 acres in size and is identified as Tax Map Key No. (4) 4-7-004:001. The proposed project is contained within an approximate 53.361 acre portion of the large lot.

The Kealia Residential Subdivision will utilize the project site for single-family residential units and green space. The proposed subdivision contains single family lots ranging from 6,000 to 7,300 square feet. A total of 237 single family lots are planned. In addition, a 4.3 acre park/green space is planned for the development.

This development will address a portion of the demand for affordable housing in the County of Kauaʻi.

## **2. CIVIL ENGINEERING**

### **2.1 ROADWAYS**

#### ***Existing Roadways***

The existing right of ways near or adjacent to the project site are shown on Figure R-1. Pavement and striping described for lanes, etc. is not shown on the Roadways map for clarity.

Kuhio Highway is located to the east of the proposed residential subdivision. Kuhio Highway is under the jurisdiction of the State of Hawaiʻi, Department of Transportation, Highways Division. It is an asphalt concrete (AC) pavement major thoroughfare with two (2) lanes, one (1) in each direction.

There is an existing intersection on Kuhio Highway with Kealia Road. Approaching the intersection between Kuhio Highway and Kealia Road heading north, there are three (3) 12 foot wide lanes and a paved 6 foot shoulder on each side. This includes a northbound and southbound lane and a left turn lane in the middle to turn onto Kealia Road. At the intersection there is also an eastbound turn onto a beach access road, which is a dirt road that parallels Kealia beach.

Just north of the Kuhio Highway and Kealia Road intersection there is a 12 foot wide bus stop lane, one (1) on each side of the Kuhio Highway; as well as a 12 foot wide southbound left turn lane onto the beach access road. Also just north of the Kealia Road and Kuhio Highway intersection, heading south, is a right turn (westbound) onto a one (1) way, 9 foot road that feeds to Kealia Road. North of the intersection and turn, Kuhio Highway narrows to two (2) 11 foot wide lanes with 6 foot paved shoulders. At about 450 feet north up the highway, the shoulders widen to 10 feet on each side.

The intersection of Kuhio Highway and Kamole Road is approximately 1,900 feet north of the Kuhio/Kealia intersection. Kamole Road is a County road with a 40 foot right-of-way. It has a pavement width of approximately 18 feet and has no striping except at the intersection. Kamole Road services an existing small subdivision with approximately 19 lots.

Just north of the Kuhio/ Kamole intersection is a 12 foot wide bus stop lane, located on the east side of the highway heading north. North of the Kamole Road intersection and bus stop, the Kuhio Highway shoulders narrow to 6 feet wide with lanes still at 11 feet wide in both travel directions.

About 600 feet north of the Kamole Road intersection on Kuhio Highway is an intersection with a two (2)-way road, with 9 foot wide lanes onto Kapoli Street. This road is AC pavement with no striping except at the intersection. At this intersection, there is a 14 foot wide turn lane to turn right off of and back onto Kuhio Highway. Kapoli Street services the Kealia Makai Subdivision.

The primary access to and egress from the proposed project site is Kealia Road. It is a County road with a 40 foot right-of-way (ROW), two (2)-way AC pavement road, with 9 foot wide lanes (one (1) in each direction), and narrow paved shoulders. Prior to the construction of Kuhio Highway, Kealia Road was the route to get between Kapaa and Anahola. As described above, there is an existing intersection between Kuhio Highway and Kealia Road.

Approximately one (1)-half mile northbound on Kealia Rd from Kuhio Highway is an intersection with Ka'ao Road, a two (2)-way, 16 foot wide AC pavement road with no striping past the intersection. It is a dead-end street with a 40 foot ROW that is currently suburbanized with homes contained within approximately 33 lots.

Approximately 200 feet north of the Ka'ao Rd intersection along Kealia Rd, there is an intersection with Hopoe Rd, a short, two (2)-way, 9 foot wide, AC pavement road with no striping except at the intersection. It is a dead-end street with a 30 foot ROW that serves three (3) existing house lots.

### ***Proposed Roadways***

The proposed roadways for the Kealia Residential Subdivision can be seen on Figure R-2. All proposed roads within the subdivision are to be in accordance with County of

Kaua'i 1972, *County Road Standards*<sup>1</sup>. It is intended that all of the proposed subdivision roads will be conveyed by the developer to the County of Kauai

A roundabout entrance to the subdivision is proposed in order to provide a safe and efficient central nexus for all adjoining subdivision roads. Proposed roads connecting to the roundabout will be "Collector" roads as defined by County road standards. Collector roads have a 56 foot ROW and 40 foot wide pavement. There are a total of two (2) Collector roads proposed for this project. One (1) of the proposed Collector roads will run in the north-south direction and the other proposed Collector road will run in the east-west direction.

The majority of the roads within the proposed subdivision will be "Minor" roads as defined by County road standards. Minor roads have a 44 foot ROW and 20 foot wide pavement. There are a total of nine (9) Minor roads proposed for this project. Three (3) Minor road will traverse the north-south direction and six (6) will traverse in the east-west direction.

## 2.2 DRAINAGE AND FLOOD CONSIDERATIONS

A preliminary drainage study was conducted in order to estimate existing flow patterns and runoff quantities and also proposed post-development flow patterns and runoff quantities. A detailed Drainage and Erosion Mitigation Plan will be prepared and submitted to the County Engineer for approval during the design and development stages. The U.S. Department of Agriculture, Soil Conservation Service, *Technical Report #55*<sup>10</sup> (TR-55), a hydrologic modeling program, was used to study drainage patterns for the existing and proposed conditions of the project area.

The proposed project site entirely located in the flood zone designation Zone X according to the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) Community-Panel No. 1500020210F. Figure D-1 contains a map of the proposed project site produced from the State of Hawaii's *Flood Hazard Assessment Tool* (FHAT). Zone X is described as areas outside of the 100- and 500-year floodplains with minimal flooding.

### ***Existing Condition***

The existing 1075.6 acre large lot is mostly pasture land that is utilized for a cattle ranching. The large lot and proposed project site is largely undeveloped and the relatively few drainage structures are remnants of an old irrigation system from the plantation era. Approximate watershed drainage tributary areas can be found on Figure D-2.

Evaluation of the proposed project site topography, in its existing condition, indicates that the site generally drains from the mauka side towards Kuhio Highway. A relatively mild ridgeline aligned in the east-west direction causes water north of it to run off to a northern

exit, and water south of it to run off to a southern exit. For analysis purposes, the area was split into two (2) subareas, Subarea 1 and Subarea 2, with the high ground as the dividing point as shown in Figure D-3.

The below Table No. 1 contains the existing condition TR-55 model results:

Table No. 1 – Storm Water Runoff for the 2 Year Storm Event, Existing Condition

Sub-Area	Land Area (Acres)	Weighted Curve Number	Time of Concentration (Hours)	Two (2) Year Storm Runoff (CFS)
E1	25.44	79	0.292	14.32
E2	28.10	79	0.420	13.69

There are three (3) existing drainage outlet points from the project site and the points are described below:

- Subarea 1 outlets to a two (2) foot diameter concrete pipe culvert on the north-east end of the proposed development area that runs under Kuhio Highway and outlets on the makai side of the highway,
- Subarea 2 partially outlets with overland flow via a natural drainage way that spills into an existing concrete swale on the mauka side of Kuhio Highway, and
- Subarea 2 remainder outlets to a 10 foot wide Drainage Right-Of-Way that connects with the proposed project site, crosses Ka`ao Road via a 2 foot diameter concrete pipe culvert and outlets on a hillside within the large lot.

Runoff that is transmitted by Subarea 2 combine with other drainage areas and are conveyed by an existing 8 foot by 5 foot rectangular concrete drainage box culvert beyond the south end of the proposed project area and within the large lot that runs under Kuhio Highway and outlets on the Kealia Beach side of the highway. Figure D-3 shows the location of the 8 foot by 5 foot rectangular concrete drainage box culvert.

### ***Post-Development Conditions***

Per County of Kauai, Department of Public Works' requirements from their *Storm Water Runoff System Manual*<sup>7</sup>, storm water runoff cannot exceed the predevelopment conditions. The aforementioned TR-55 model was also used to analyze post-development storm water runoff. Storm water generated from each individual lot within the project area will be directed to the nearest downstream street or natural drainage way that will collect the storm water and convey it to the two (2) proposed detention basins shown on Figure D-4.

The detention basins moderate the storm flows and allow infiltration back into the soil. They were sized in accordance with the existing peak flows for both the 2 year and 100



year storm events. Detention Basin 2 on the southern end of the project area is intended to have the multiple purposes of green space / park / detention basin.

The analysis for post-developed flow, after multiple iterations of subbasin sizes, produced a runoff flow of 13.52 CFS and 12.99 CFS for the first and second sub areas, respectively. With the runoff flow being less during post-developed conditions than that of current undeveloped conditions, it is safe to assume that the Kealia Residential Subdivision area will not have a negative impact on the surrounding and downstream lands.

Table No. 2 – Storm Water Runoff for the 2 Year Storm Event, Proposed Condition

Sub-Area	Land Area (Acres)	Weighted Curve Number	Time of Concentration (Hours)	Two (2) Year Storm Runoff (CFS)
P1	24.85	87	0.114	13.52
P2	28.78	87	0.257	12.99

## 2.3 GRADING

### ***Existing Topography***

The site is generally gently sloping from mauka toward Kuhio Highway. The average slope from top to bottom is approximately 3%. Figure G-1 shows the existing topography of the entire 1075.6 acre lot. The lot is largely undeveloped, with the flat lands being utilized as pasture, and the valleys being occupied by trees, bushes, and other greenery.

### ***Proposed Condition***

The Proposed Grading layout as shown in Figure G-2 will be in accordance with the County of Kaua'i Ordinance 808 *Grading, Grubbing and Stockpiling*<sup>6</sup>. The grading plan for Kealia began with the initial elevations calculated by topographic surveys. The drainage concept was created by using these elevation calculations in combination with AutoCAD feature lines and alignments. From these structures, a 3D model of the finished grading with drainage into the detention basins.

The estimated earthwork quantity of excavation is 350,000 YD<sup>3</sup> and the total of estimated embankment is 347,000 YD<sup>3</sup>. The net excavation is 3,000 YD<sup>3</sup>. Figure G-3 demonstrates the estimated excavation and embankment quantities in addition to the contours and cross section plans of the site from two (2) directions.

Table No. 3 – Estimated Earthwork Quantities, Proposed Condition

Excavation (YD <sup>3</sup> )	Embankment (YD <sup>3</sup> )	Net (YD <sup>3</sup> )
350,000	347,000	3,000

During construction of the Kealia Residential Subdivision, the contractor shall implement and maintain storm and surface water runoff Best Management practices (BMPs), subject to any applicable review and approval of the State Department of Health, designed to prevent violations of State water quality standards as a result of storm water discharges originating from the project. These BMPs will be documented in a declaration of covenants, conditions and restrictions that will be recorded against the property and will run with the land.

Potential water quality impacts during construction of the project will be alleviated by adherence to State and County water quality regulations governing grading, excavation and stockpiling. Construction BMPs will be utilized pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation during construction. BMPs will also be implemented for long term development and operation of activities occurring on the site as part of pollution prevention measures.

## 2.4 POTABLE WATER SYSTEM

### *Existing Water System*

The existing dwellings located near the proposed project area are serviced through a domestic water system called the Kealia Water System. The water system is identified by the State of Hawaii, Department of Health, as Public Water System #423. See Figure W-1 for a map of the water system

A well site containing two (2) wells located on the western side of Kealia Road provides source water for the system. A 12-inch waterline runs north along Kealia Road and connects the wells to two (2) 67,000 (nominal) gallon domestic water tanks. This water system also services lots along Ka'ao and Hopoe Road with an 8" waterline branching off from Kealia Road. There is also a 12-inch waterline that branches off of Kealia Road to serve the Kealia Makai Subdivision on the east side of Kuhio Highway. This waterline intersects the proposed Kealia Residential Subdivision.

According to the Kealia Water System 2017 Consumer Confidence Report<sup>11</sup>, water for the System is obtained via a groundwater source. The Water System provides water to approximately 60 homes in the former Kealia Plantation Camp and has 35 service connections at the Kealia Makai Subdivision. Water from the Kealia Water System met all U.S. Environmental Protection Agency and state drinking water health standards.

Data was collected from testing done from January 1, 2016 through December 31, 2016. More information and data regarding the Kealia Water System's water quality can be found in the Consumer Confidence Report<sup>11</sup>.

The Kealia Water System is owned by the entity, Kealia Water Company Holdings, LLC (Water Company). A "*Water Service Agreement*" exists between the Water Company and the current owners of the property in which the subject subdivision is proposed. **Appendix A** contains a copy of the agreement; the copy is abbreviated due to the large document size. The agreement allows a daily aggregate of 300,000 gallons of potable water per day (gpd) to be reserved for the use of the owners of property located in the subject area.

### ***Proposed Water System***

The State of Hawai'i, *Water System Standards*<sup>9</sup> is the guiding standard for potable water systems. The standards require that the planning and design of a water system allocate each single family unit an average of 500 gallons of water per day. Furthermore, the maximum daily demand calculations require that the average daily demand allocation be multiplied by a factor of 1.5.

The below Table No. 4 contain the water demand calculations per the *Water System Standards*:

Table No. 4 – Domestic Water Demand Estimation

Number of Proposed Units	Average Daily Demand Unit Requirement (gal/day)	Average Daily Demand Total Requirement (gal/day)	Maximum Daily Demand (gal/day)
236	500	118,000	177,250

The existing water wells within the Kealia Water System will provide the required source capacity of 177,250 gallons per day. Upgrading of the existing well pump assembly may be necessary to achieve the required demand. The existing *Water Service Agreement* allows for drawing up to 300,000 gallons per day as described above.

The *Water System Standards* also have standards for water storage reservoir sizing. The standards requires that the water reservoir for the development has enough capacity to meet fire flow requirements, in addition to the maximum daily demand. Fire flow requirements are based on land use and zoning. The proposed subdivision will have density that is roughly equivalent to R-6 zoning. Accordingly, the proposed

development's fire flow requirements include being able to produce a flow of 1,000 gallons per minute, for a duration of 2 hours. The *Water System Standards*<sup>9</sup> require that the reservoir capacity will be sized as follows:

1. Meet maximum daily consumption. Reservoir full at the beginning of the 24-hour period with no source input to the reservoir.
2. Meet maximum day rate plus fire flow for duration of fire. Reservoir  $\frac{3}{4}$  full at start of fire, with credit for incoming flow from pumps, one (1) maximum size pump out of service.
3. Minimum size reservoir shall be 0.1 MG. Reservoir size shall be as specified in Section 105.10 – RESERVOIR. Subsection A – Size.

From these calculations (shown Table W-1), the proposed Kealia Residential Subdivision will have a maximum daily demand of 177,250 gallons per day. Therefore in accordance with the *Water System Standards*<sup>9</sup> sizing method detailed above, 177,250 gallons water storage capacity is needed. It is proposed that a 200,000 gallon tank be installed adjacent to the two (2) existing 67,500 gallon tanks to satisfy the storage requirements. The proposed water tank will also connect to the existing water system as shown in Figure W-1.

The existing potable water transmission and distributions system will have to be upgraded to service the proposed development. Figure W-1 shows the proposed system improvements. All expansions and improvements of the Kealia Water System shall be in accordance with the *Water Service Agreement* and the *Water System Standards*.

## 2.5 SOLID WASTE GENERATION

### ***Existing Condition***

The County has one (1) landfill that services the entire island, the Central Kaua'i Landfill, located in Kekaha. According to the County of Kaua'i's Integrated Solid Waste Management Plan<sup>4</sup>, the Central Kaua'i Landfill will need to undergo expansion to increase capacity. In discussions with a representative from the Department of Public Works, Solid Waste Division, there are plans to expand the landfill to give capacity until 2027.

There currently is no solid waste generation from the project site. The County does, however, service the adjacent dwellings along Ka'ao and Hopoe Roads. Figure M-1 contains a map of the County of Kaua'i solid waste infrastructure.

Residential waste is collected via the County of Kaua'i's Residential Refuse Collection program. According to the *Summary of the Residential Refuse Collection Assessment*<sup>8</sup>, customers are able to choose a 64 gallon or 96 gallon cart for automated curbside refuse pickup. Alternatively, there is a refuse transfer station located in Kapa'a town, as shown in Figure M-1.

### ***Proposed Condition***

The project site is undeveloped and, as such, has few fixed structures that would need to be disposed as construction waste. There are remnants of current and past irrigation systems onsite, such as pipes and small concrete headwalls. Waste generated through construction will consist predominantly of vegetation and debris. Soil and debris displaced from grading and clearing will be utilized as fill throughout the site as required, minimizing disposal and transit/relocation of the materials. Construction materials that are rendered un-recyclable will be disposed of in the Central Kaua'i Landfill.

The County of Kauai provides Residential Refuse Collection via a *Pay as You Throw* (PAYT) program. Curbside refuse collection is offered on a once-per-week basis, and customers are able to choose a refuse cart size. A representative of the County of Kaua'i's Solid Waste Management Division has indicated that the County would service the proposed subdivision.

The quantity of solid waste generated from the proposed project may be estimated by assuming that each household will fill the 64 gallon cart each week. Table No. 5 below provides an estimate of the projected annual waste load.

Table No. 5 – Solid Waste Generation Estimate

Number of Proposed Units	Unit Solid Waste Disposal Rate (gallons/week)	Unit Solid Waste Disposal Rate (gallons/year)	Unit Density Solid Waste (pounds/gallons)	Waste Disposal Rate (tons/year)
236	64	3,328	4.82	8.02

Mandatory compliance with existing regulations and requirements will ensure that the project will have a less than significant impact in regards to solid waste management.

### **3. WASTEWATER ENGINEERING**

#### **3.1 EXISTING WASTEWATER DISPOSAL SYSTEMS**

According to the *Kaua'i General Plan 2000*<sup>5</sup>, the County operates four (4) wastewater systems serving Waimea, Hanapepe-'Ele'ele, Lihu'e-Hanama'ulu, and the Kuhio Highway corridor between Wailua and Kapa'a. All but the Waimea plant have substantial amounts of available treatment plant capacity, but this capacity is already committed to existing and planned developments.

In the Wailua - Kapa'a area, wastewater treatment is accomplished with either Individual Wastewater Systems (IWS), such as cesspools or septic tanks, or at the County owned and operated Wailua Wastewater Treatment Plant (WWTP). IWSs generally used in the parcels that have water service but no sewer service.

The County completed a study of the Wailua/Kapa'a wastewater system. The study is entitled *Final Wailua Facility Plan*<sup>2</sup>. According to the *Wailua Facility Plan*, the Wailua Wastewater Treatment Plant was originally constructed in 1964, and is located on approximately 2.1 acres of County owned land next to Lydgate Beach Park. It receives wastewater from Kapa'a, Papaloa, Waipouli, and Wailua areas. It was originally designed to treat an average flow of 0.5 mgd, but the plant has gone through four (4) phases of construction to expand. The treatment plant's current average daily flow capacity is 1.5 mgd, with a peak flow capacity of 5.03 mgd. The wastewater treatment plant currently receives about 0.7 million gallons per day (mgd) of flow. However, it is considered to have a capacity of about 1.0 mgd due to the estimated treatment capacity of the aeration basins and the chlorine contact tank.

Because the discharge of raw waste into the ground is not beneficial to the environment, the Department of Health prohibits the construction of any new cesspools. According to the *Wailua Facility Plan*, approximately 12% of the cesspools in the Wailua-Kapa'a area have reported cesspool failures. A cesspool failure occurs when a cesspool overflows and is reported to the Department of Health.

### 3.2 PROPOSED WASTEWATER COLLECTION SYSTEM

In preliminary discussions with representatives from the County of Kaua'i, Department of Public Works, Wastewater Management Division, it was indicated that the County would service the proposed subdivision. The representatives indicated however, that they typically do not issue "will serve" letters to developments until such developments have obtained zoning approvals.

The County of Kaua'i, Department of Public Works, *Sewer Design Standards*<sup>3</sup> were utilized to estimate wastewater generation quantities. According to the standards, it is assumed each household to have four (4) occupants, with an average daily per capita flow of 100 gallons per day, giving an average of 400 gallons of wastewater per household per day. Once at total capacity, the Kealia Residential Subdivision project will produce approximately 94,400 gallons of wastewater per day. The maximum flow of sewage from the development is approximately 472,000 gallons per day (0.472 mgd), calculated by multiplying the average daily flow by a flow factor of 5 (from *Sewer Design Standards*<sup>3</sup>). The peak flow of sewage is the sum of the maximum flow of sewage and the rate of groundwater infiltration. The calculated peak flow of sewage from the development is 472,000 gpd. Table No. 6 below provides a summary of the wastewater generation calculations.

Table No. 6 – Domestic Wastewater Estimation

Number of Proposed Units	Unit Household Wastewater Generation Rate (gpd/household)	Average Daily Wastewater Flow (gpd)	Maximum Daily Wastewater Flow (gpd)	Peak Wastewater Flow <sup>1</sup> (gpd)
236	400	94,400	472,000	472,000

<sup>1</sup>Note: Assume no groundwater infiltration because sewer pipes are constructed of PVC piping and infiltration is not expected with PVC piping.

All wastewater will gravity flow toward sewer manhole #1 (as shown on Figure S-2). The wastewater will then gravity flow to the proposed wastewater pump station along Kuhio Highway. The proposed wastewater pump station will connect to the existing sewer line in front of the Kaiakea Fire Station, as shown on Figure S-3.

The proposed gravity and force mains will connect the Subdivision to the existing wastewater system that services the Wailua-Kapa'a area, and to the Wailua WWTP. The proposed Kealia Residential Subdivision will need to install an on-site wastewater pump station and approximately 3,884 linear feet of new 4-inch diameter force main. The proposed wastewater pump station shall be placed as close as permitted to the Kaiakea Fire Station to reduce the distance the sewage travels through the force main, which will help with odor control in the area.

## 4. ELECTRICAL ENGINEERING

### 4.1 EXISTING ELECTRICAL POWER SYSTEM

Kaua'i Island Utility Cooperative (KIUC) is Hawai'i's only member-owned electric utility. They currently have a generating capacity of 125 megawatts (MW). More than 40% of the electricity generated by KIUC comes from renewable energy resources.

The Kealia Residential Subdivision project is part of the Kawaihau region, which, according to the Kaua'i General Plan<sup>5</sup>, is served via a tap off of the mauka transmission line that connects the Wainiha Hydroelectric Plant with Port Allen. This tap provides power via the Kapa'a Switchyard to Kapa'a Town and other developed coastal areas, as well as to residential communities in Kapa'a and Wailua homestead areas. Kapa'a

Switchyard is also linked to the Lydgate Substation and the Lihu'e Switchyard. Power is also supplied through the Anahola Substation, which was recently completed. Figure E-1 contains a map of the KIUC transmission and distribution system in the Kealia area.

Kuhio Highway in the vicinity of the proposed project contains existing KIUC transmission lines. KIUC undertook and completed a project on the Kealia vicinity Kuhio Highway transmission line within the past five (5) years in which overhead lines were placed underground. The project was part of KIUC's overall effort to reduce exposure of overhead line to endangered seabirds including the Newall Shearwater.

In the Kealia area, there are existing overhead distribution lines that service the existing dwellings along Kealia Road, as well as along Ka'ao and Hopoe Roads.

#### 4.2 PROPOSED ELECTRICAL POWER SYSTEM

KIUC representatives have indicated that they have sufficient generating capacity to serve the proposed development. Standard electrical power transmission improvements would be required, however, the representative estimated that the improvement would likely be limited to the distance from Kuhio Highway to the proposed project site.

KIUC utilizes for planning purposes a unit demand of 3 kilovolt amps (KVA) of power per lot. KIUC typically provides 100 amp services for lots of the size proposed for this development. The utilities for the subdivision will mainly be placed underground. KIUC may utilize the remnant lot near the proposed roundabout that intersects with Kealia Road for switchgear equipment.

Table No. 7 – Electrical Power Demand Estimation

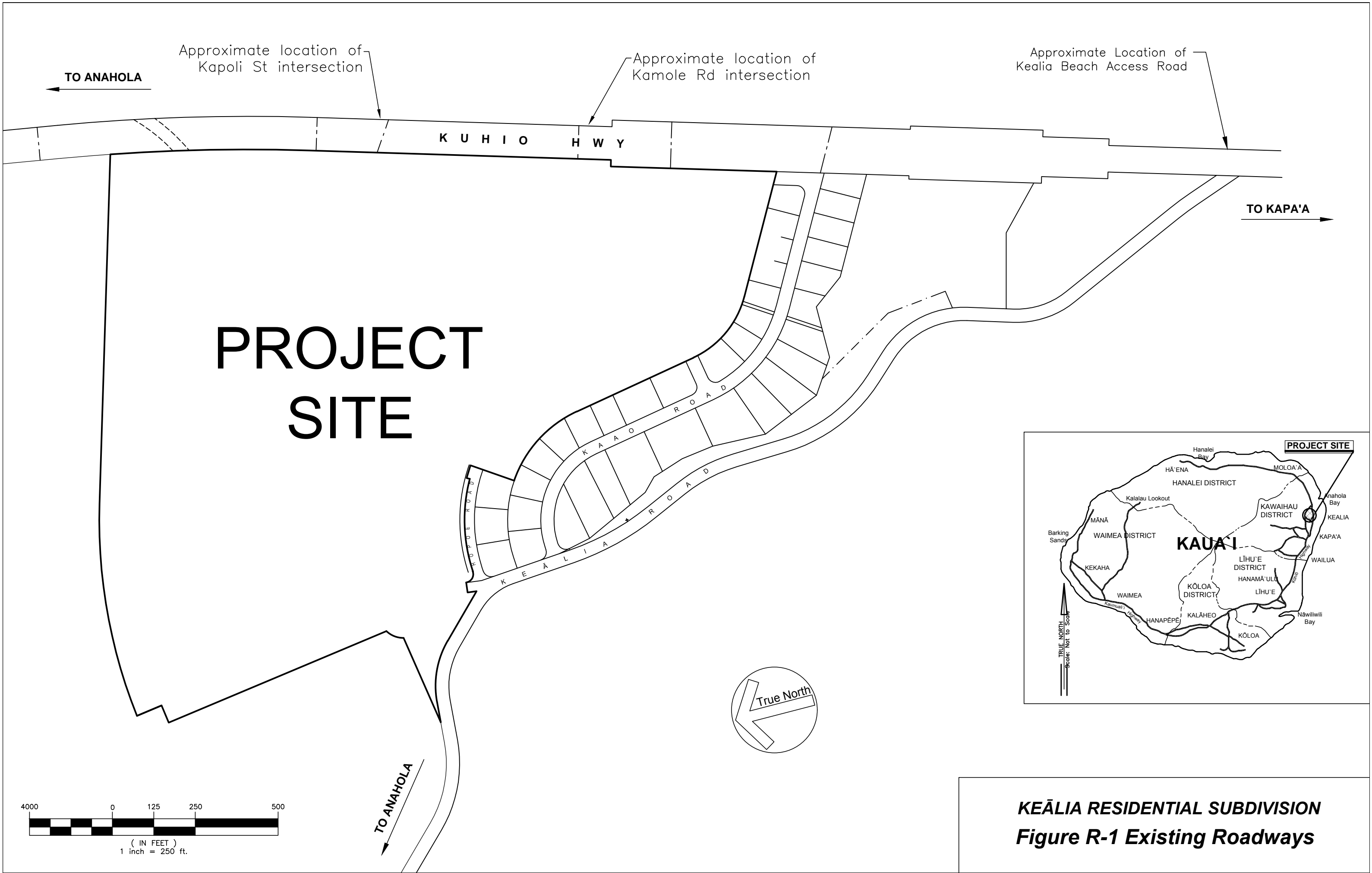
Number of Proposed Units	Unit Household Electrical Demand Rate (KVA/household)	Electrical Demand Estimation (KVA)
236	3	708

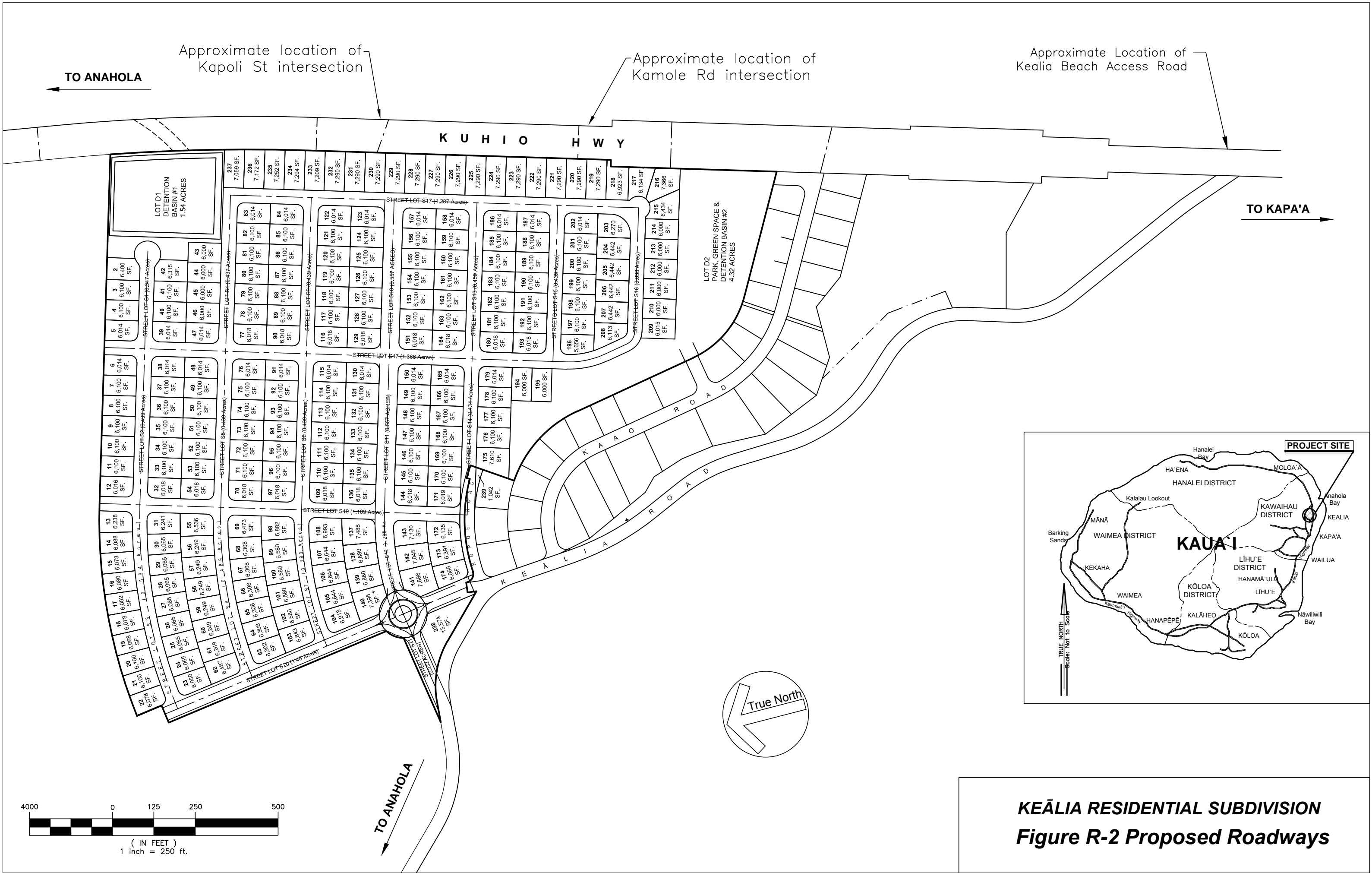
Currently, there are overhead utility lines in place that serve the existing lots along Kealia Road and the existing dwellings on Ka'ao and Hopoe Roads. However, with the proposed subdivision, these overhead lines will need to be upgraded to accommodate the new development. With these upgrades to the utilities, Kealia Road will also need to be improved to further accommodate the new development. The cost of these improvements will be paid for by the developer. The development will tie into KIUC's existing main line that runs along Kuhio Highway.

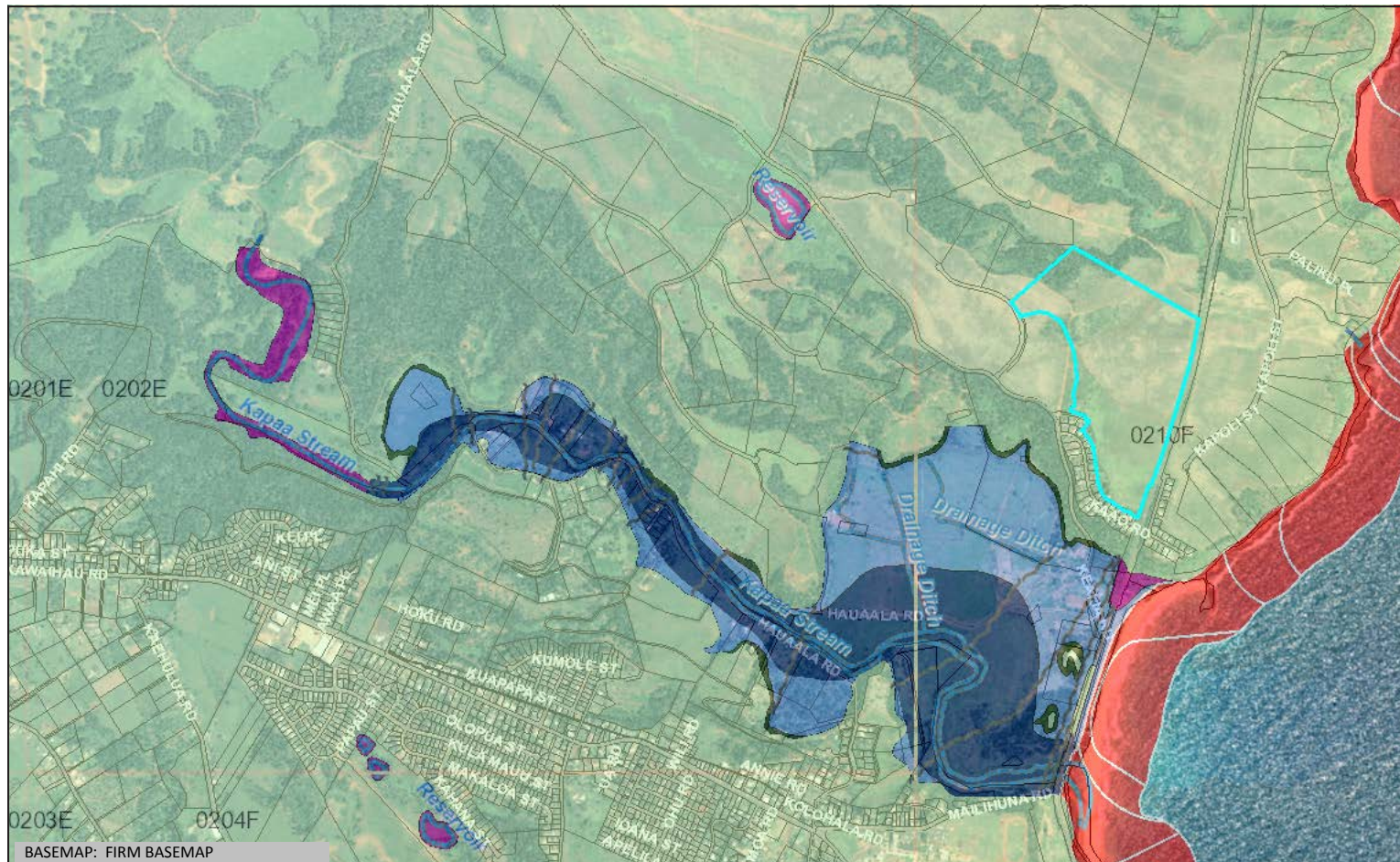


## 5. BIBLIOGRAPHY

1. County of Kaua'i, Department of Public Works, "*County Road Standards*" 1972
2. County of Kaua'i, Department of Public Works, Division of Wastewater Management, "*Final Wailua Facility Plan*", September 2008.
3. County of Kaua'i, Department of Public Works "*Sewer Design Standards*" June 1973
4. County of Kaua'i, Department of Public Works, Solid Waste Division, "*Integrated Solid Waste Management Plan*", March 2009
5. County of Kaua'i, "*Kauai General Plan*", 2000
6. County of Kaua'i Ordinance 808 "*Grading, Grubbing and Stockpiling*"
7. County of Kaua'i, Department of Public Works. "*Storm Water Runoff System Manual*"
8. County of Kauai, Department of Public Works, "*Summary of the Residential Refuse Collection Assessment*" <http://www.kauai.gov/RRCA>. Accessed June 2017.
9. State of Hawai'i, "*Water System Standards*" 2002
10. U.S. Department of Agriculture, Soil Conservation Service, *Technical Report #55* (TR-55)
11. Kealia Water System, 2017 *Consumer Confidence Report*







# Flood Hazard Assessment Report

www.hawaiiinfip.org

## Property Information

COUNTY: KAUAI  
 TMK NO: (4) 4-7-009:001  
 WATERSHED: KAPAA; KUMUKUMU  
 PARCEL ADDRESS: KEALIA RESIDENTIAL SUBDIVISION  
 KEALIA, HI 96751

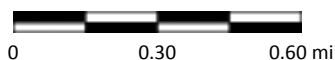
## Notes:

## Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 26, 2010  
 LETTER OF MAP CHANGE(S): NONE  
 FEMA FIRM PANEL: 1500020210F  
 PANEL EFFECTIVE DATE: NOVEMBER 26, 2010

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO  
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO  
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



**Disclaimer:** The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

## FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

**SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD** - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	<b>Zone A:</b> No BFE determined.
	<b>Zone AE:</b> BFE determined.
	<b>Zone AH:</b> Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	<b>Zone AO:</b> Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	<b>Zone V:</b> Coastal flood zone with velocity hazard (wave action); no BFE determined.
	<b>Zone VE:</b> Coastal flood zone with velocity hazard (wave action); BFE determined.
	<b>Zone AEF:</b> Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

**NON-SPECIAL FLOOD HAZARD AREA** - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

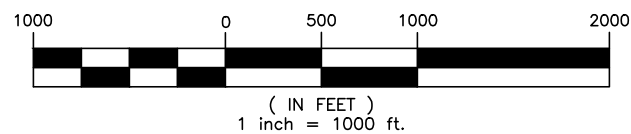
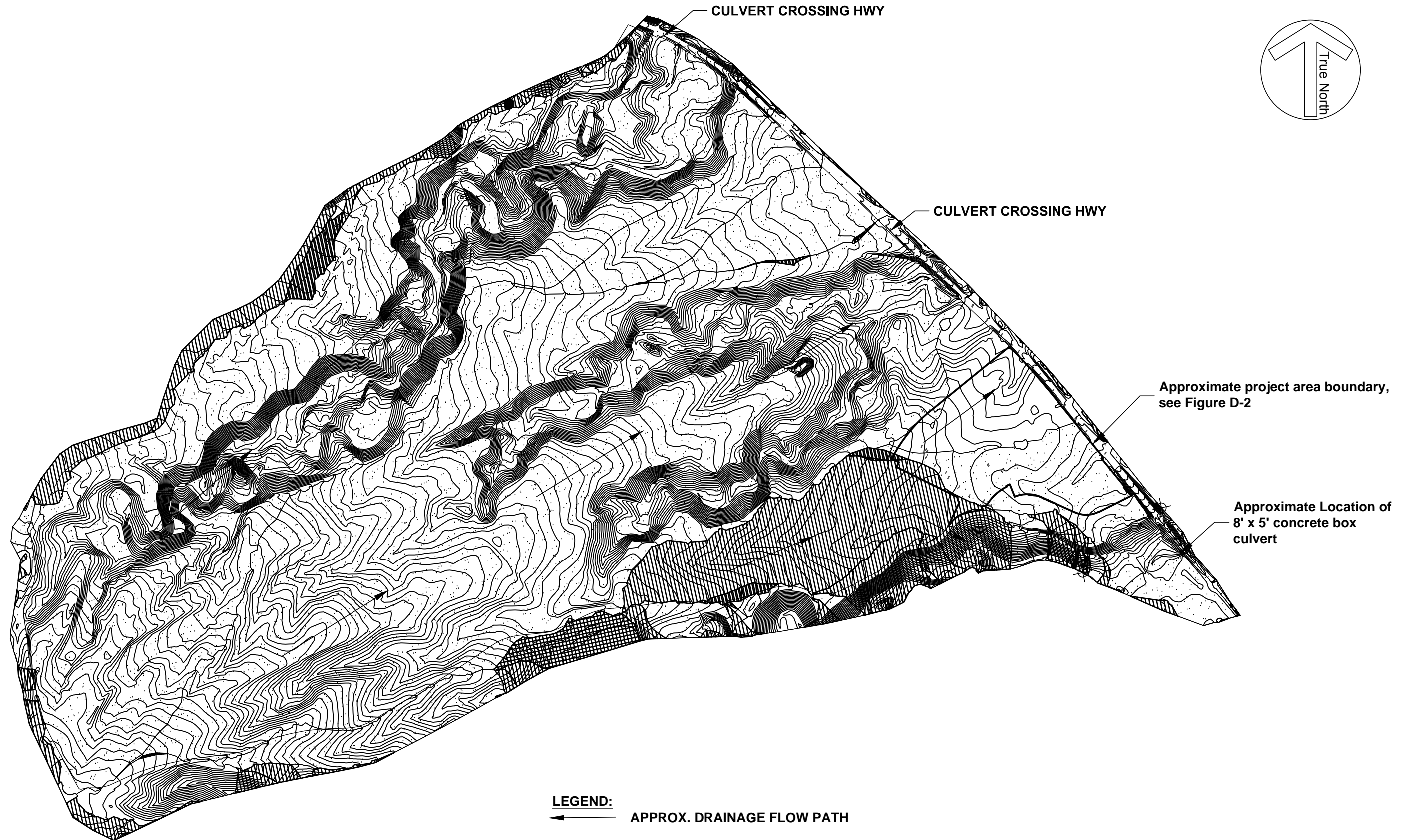
	<b>Zone XS (X shaded):</b> Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	<b>Zone X:</b> Areas determined to be outside the 0.2% annual chance floodplain.

## OTHER FLOOD AREAS

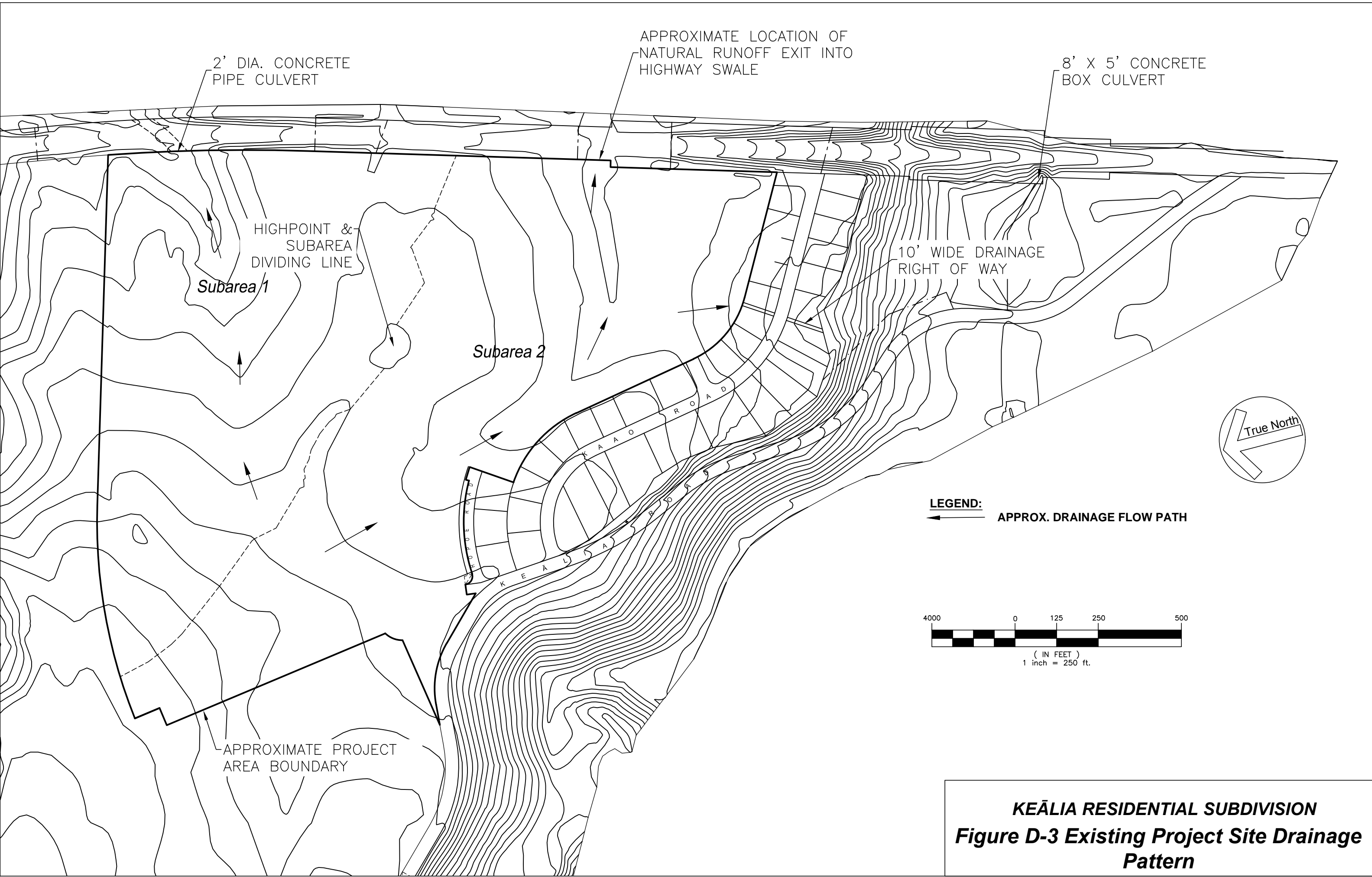
	<b>Zone D:</b> Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

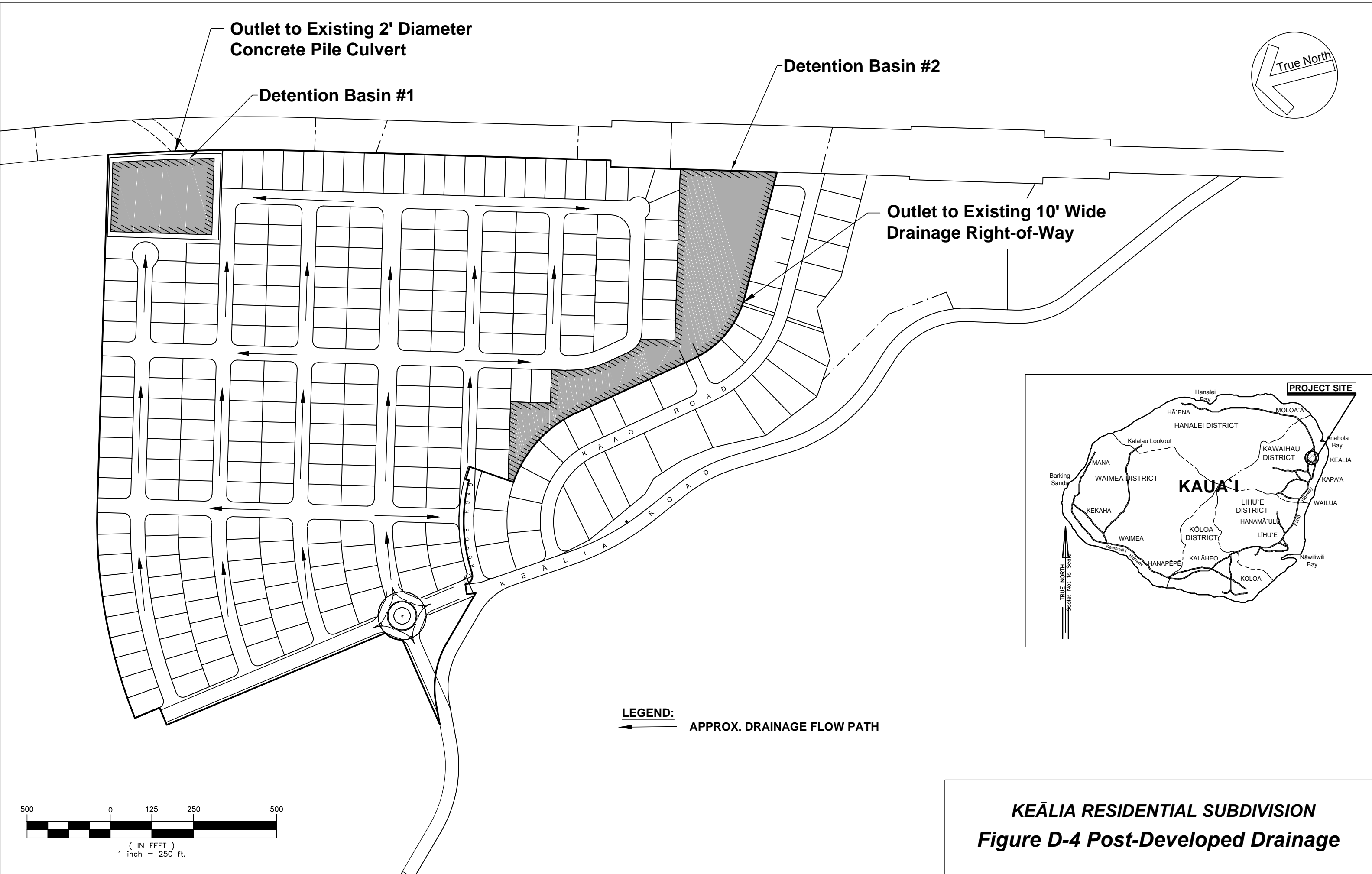
FIGURE D-1





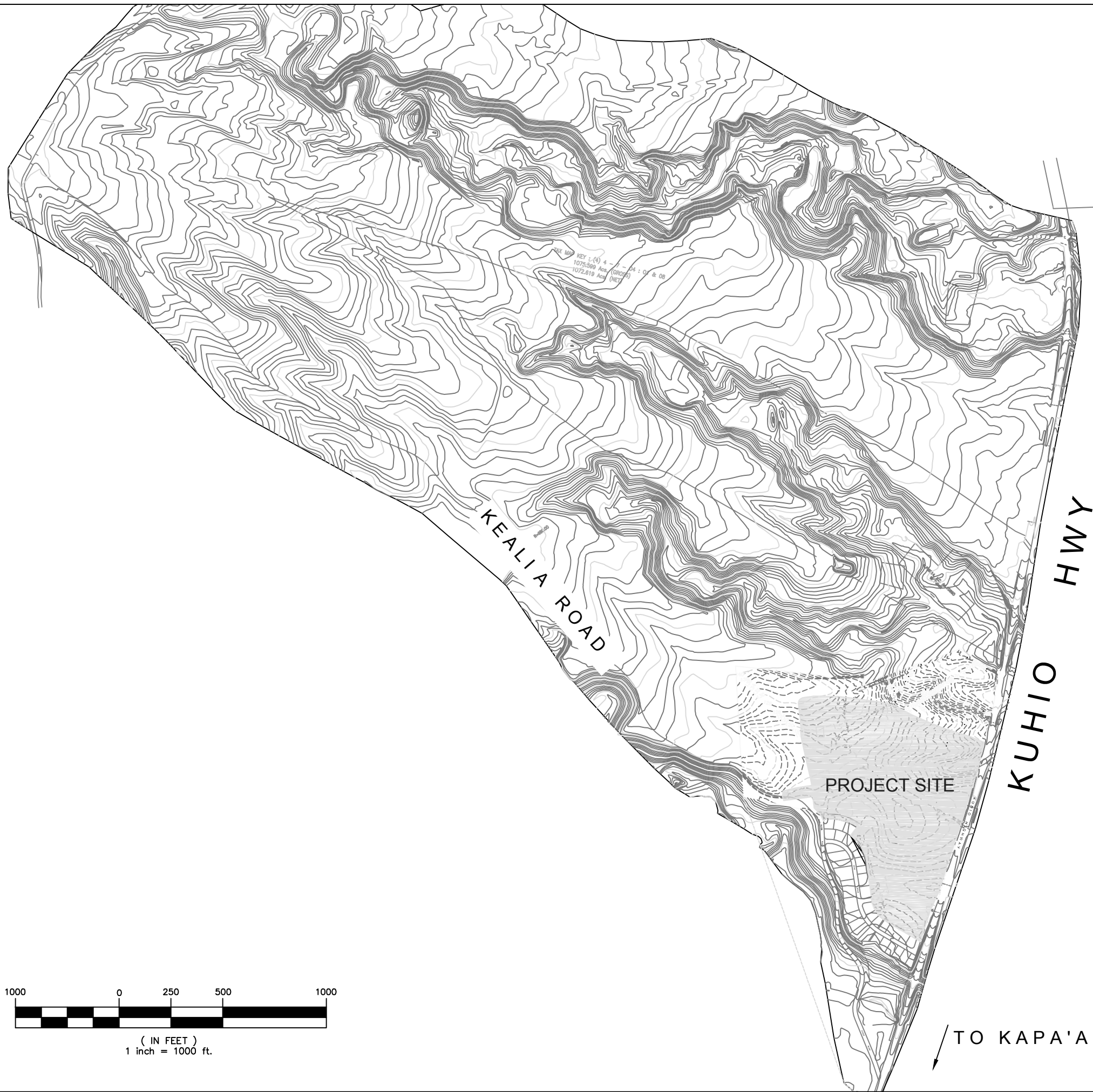
**KEĀLIA RESIDENTIAL SUBDIVISION**  
**Figure D-2 Existing Large Lot Watershed**  
**& Drainage Pattern**



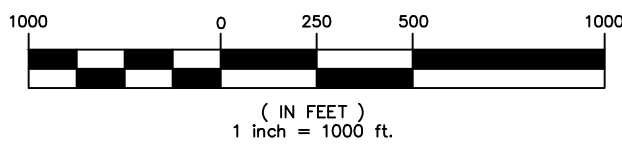
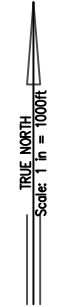


**KEĀLIA RESIDENTIAL SUBDIVISION**

**Figure D-4 Post-Developed Drainage**



↑  
TO ANAHOLA



**KEĀLIA RESIDENTIAL SUBDIVISION  
FIGURE G-1 EXISTING TOPOGRAPHY**





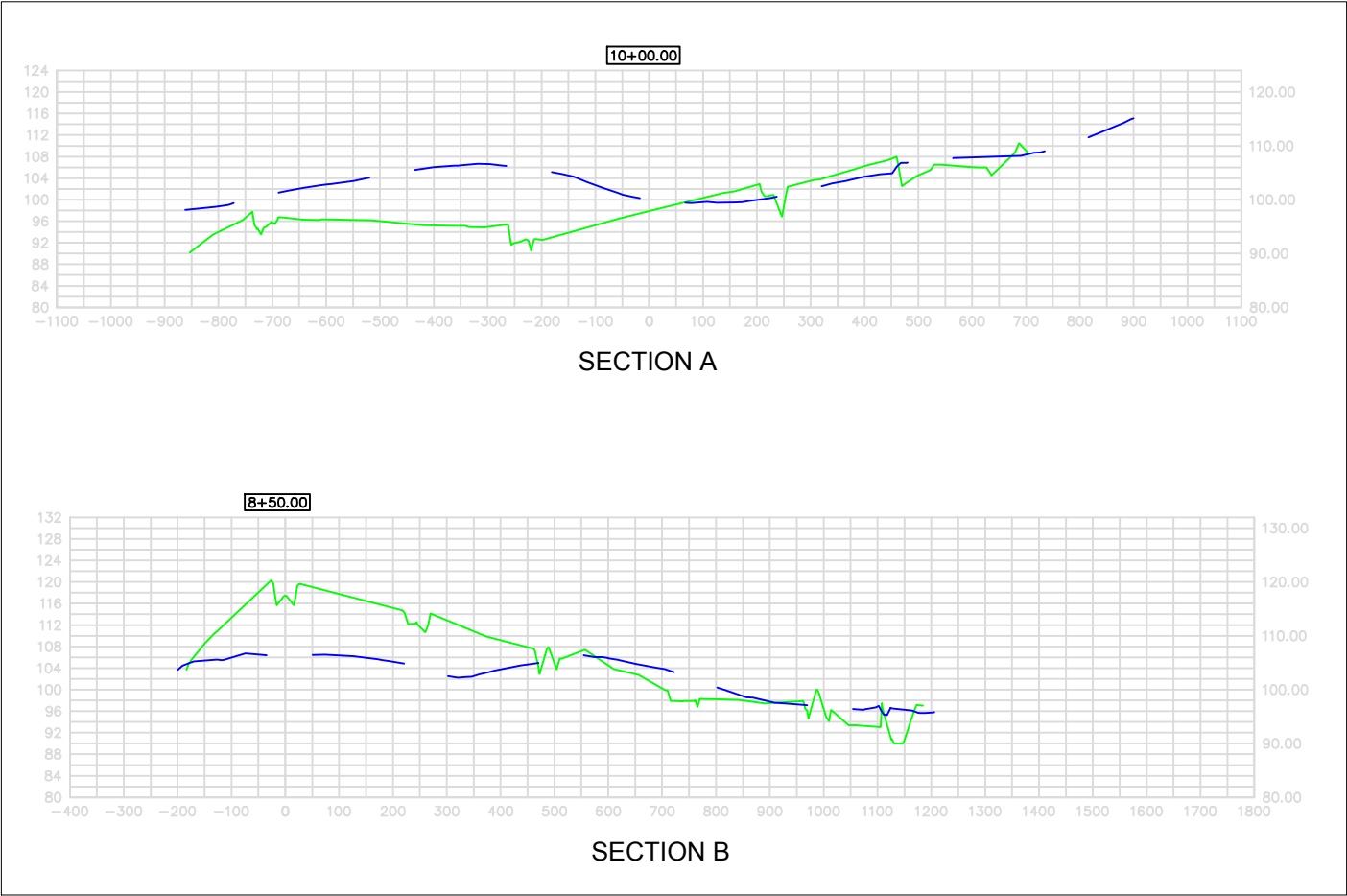
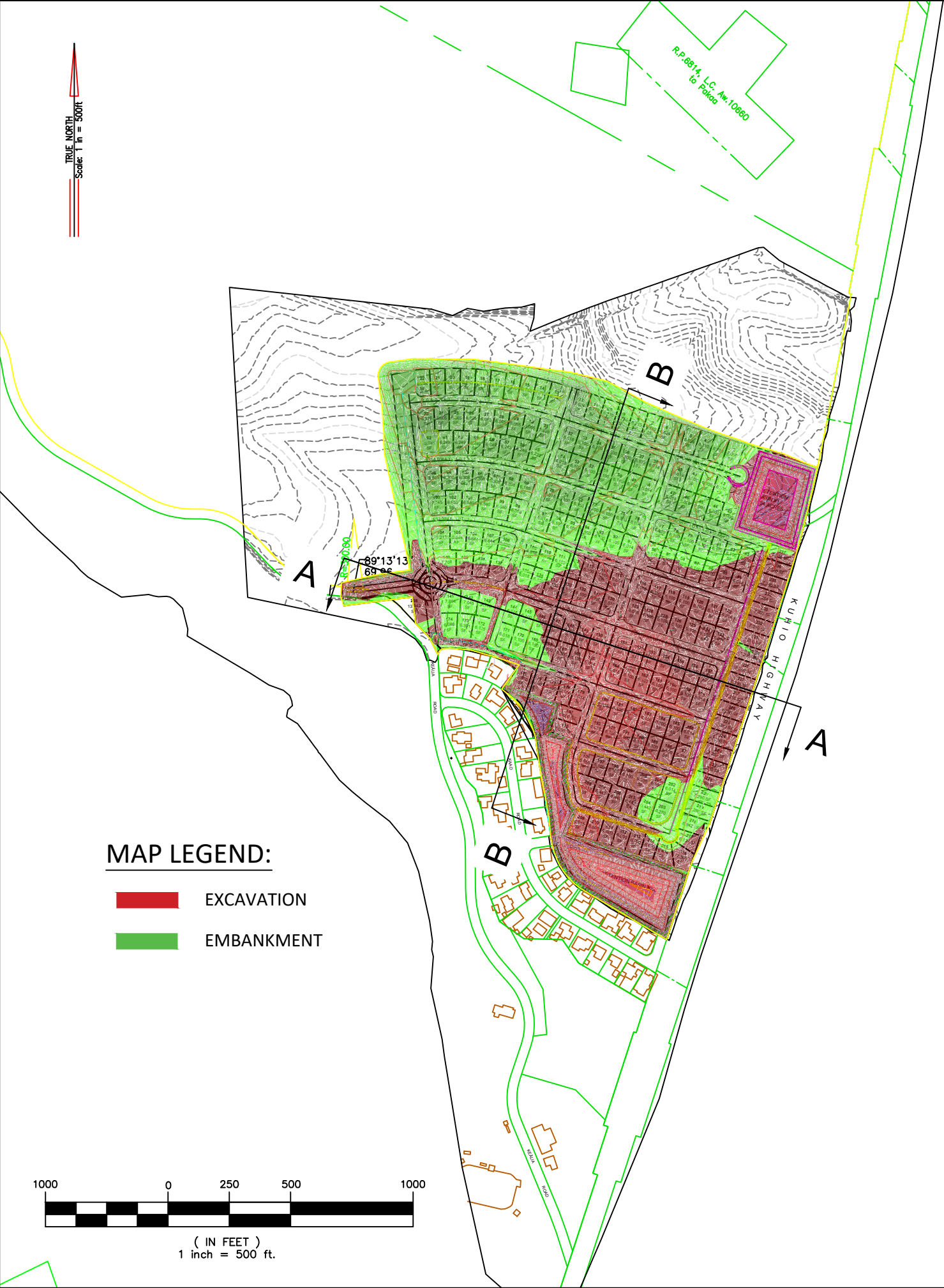
**LEGEND:**

- EXISTING SURFACE CONTOURS
- PROPOSED FINISHED CONTOURS

**ESTIMATED QUANTITY**

EXCAVATION = 350,000 CY  
EMBANKMENT = 347,000 CY  
NET EXCAVATION = 3000 CY

**KEĀLIA RESIDENTIAL SUBDIVISION  
FIGURE G-2 PRELIMINARY  
GRADING PLAN**



GRADING SECTION VIEWS A & B

ESTIMATED QUANTITY

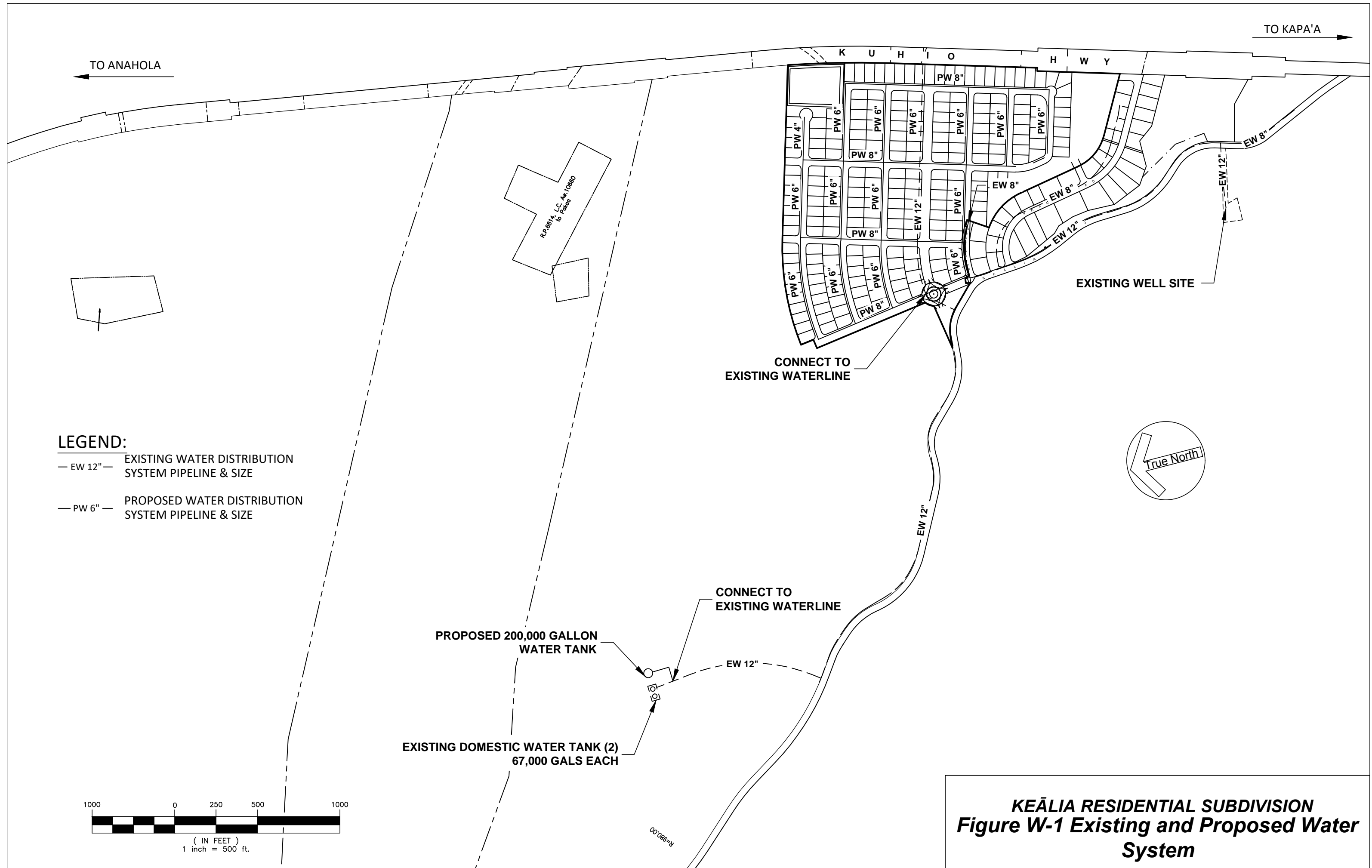
EXCAVATION = 350,000 CY

EMBANKMENT = 347,000 CY

GRAPH LEGEND:

- EXISTING GROUND SURFACE
- FINISHED GROUND SURFACE

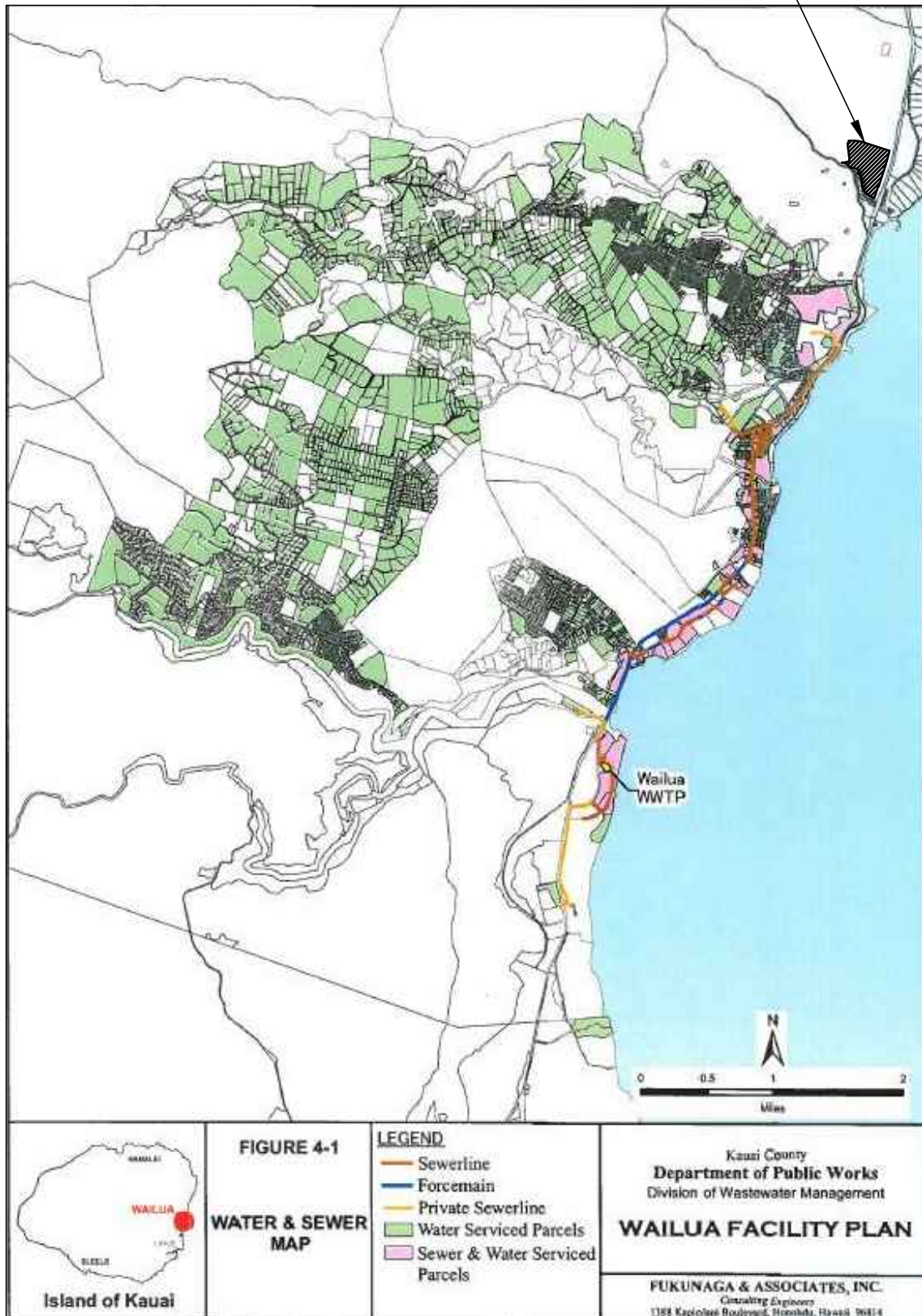
KEĀLIA RESIDENTIAL SUBDIVISION  
FIGURE G-3 PRELIMINARY  
GRADING SECTION VIEW



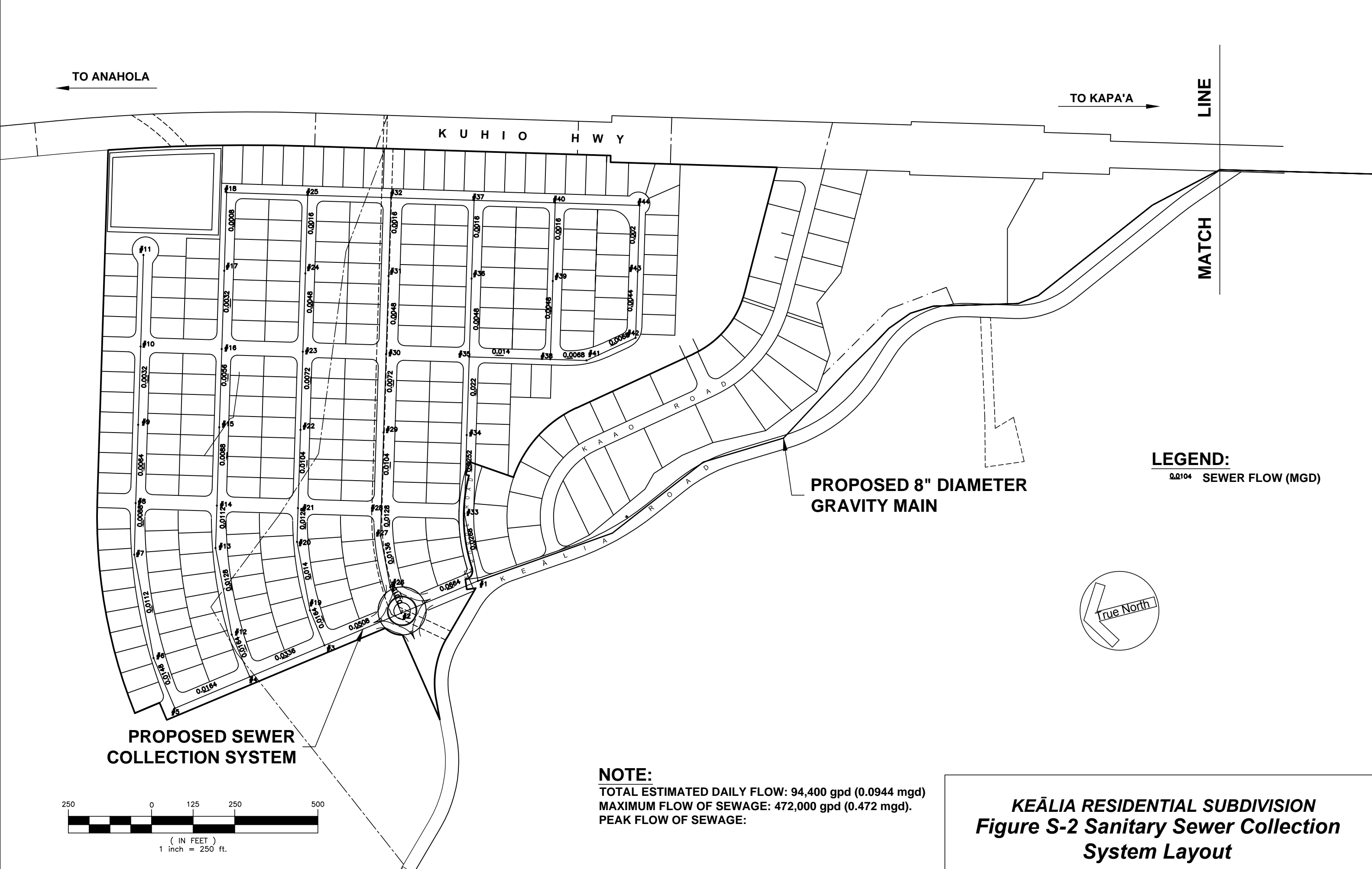




**Project Site**



**KEĀLIA RESIDENTIAL SUBDIVISION**  
**Figure S-1 Regional Wastewater**  
**System Map**



TO ANAHOLA

TO KAPA'A

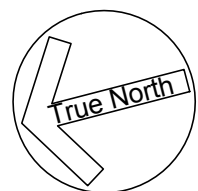
K U H I O   H W Y

LINE

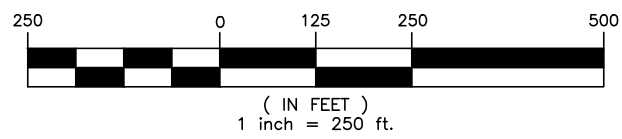
MATCH

**LEGEND:**  
0.0104 SEWER FLOW (MGD)

**PROPOSED 8" DIAMETER GRAVITY MAIN**

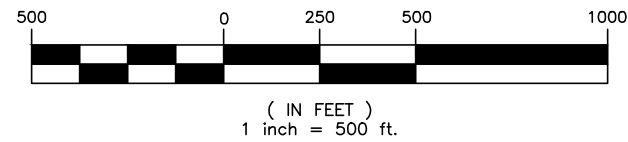


**PROPOSED SEWER COLLECTION SYSTEM**



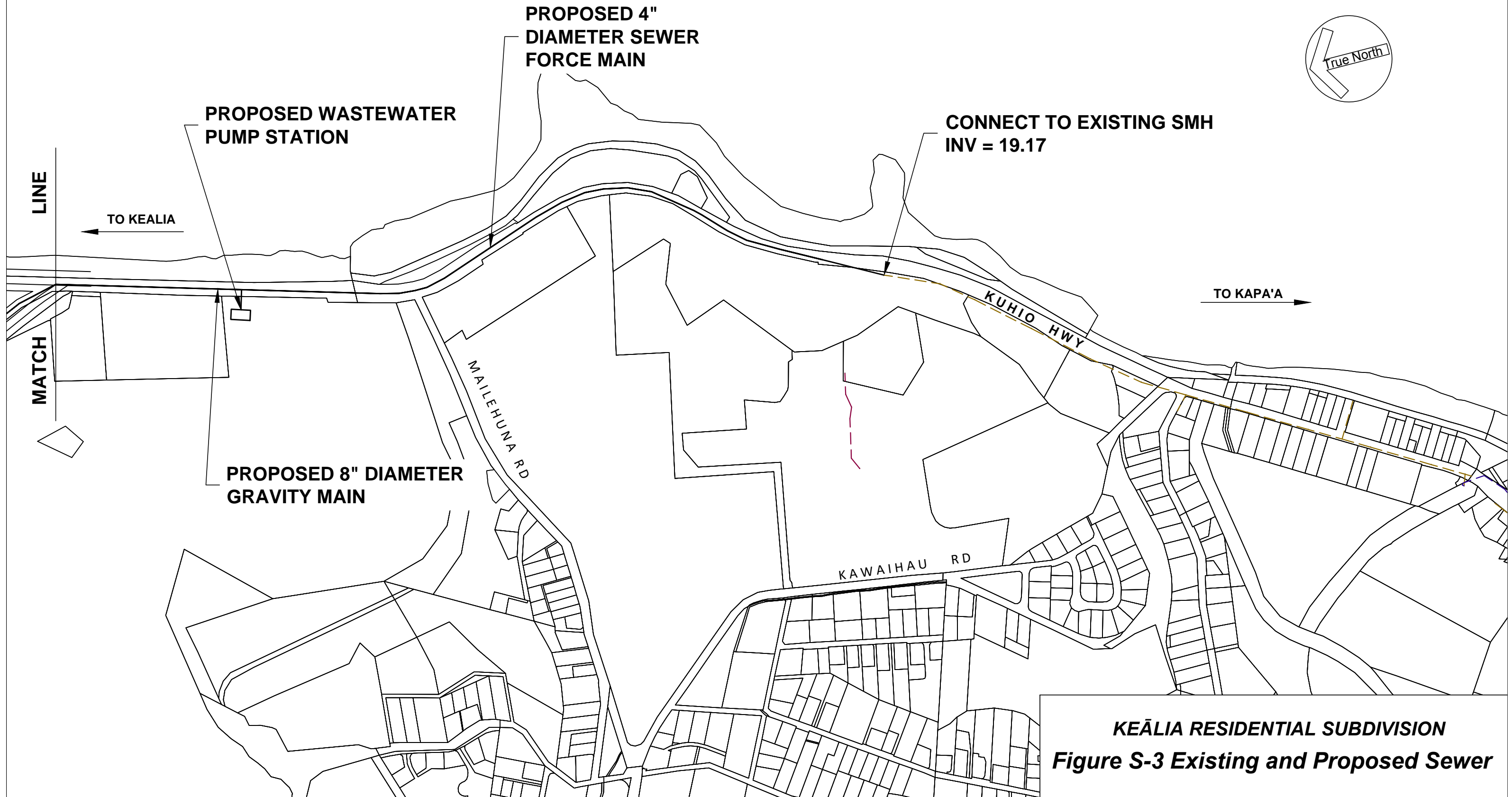
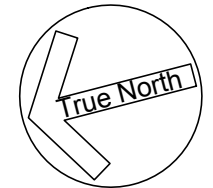
**NOTE:**  
TOTAL ESTIMATED DAILY FLOW: 94,400 gpd (0.0944 mgd)  
MAXIMUM FLOW OF SEWAGE: 472,000 gpd (0.472 mgd).  
PEAK FLOW OF SEWAGE:

**KEĀLIA RESIDENTIAL SUBDIVISION**  
**Figure S-2 Sanitary Sewer Collection System Layout**



- LEGEND:**
- PROPOSED SEWER FORCE MAIN
  - EXISTING SEWER SYSTEM
  - EXISTING SEWER SYSTEM (MAHELONA LINE)

- NOTES:**
1. DISTANCE FROM PUMP STATION TO EXISTING SMH (APPROX.): 3884'
  2. CHEMICAL INJECTIONS TO BE USED IN PROPOSED WASTEWATER PUMP STATION TO HELP WITH ODOR CONTROL



**KEĀLIA RESIDENTIAL SUBDIVISION**  
**Figure S-3 Existing and Proposed Sewer**

# Figure E-1 – KIUC Transmission and Distribution System Map

7/11/2017

Not Yet Available



## WATER SERVICE AGREEMENT

THIS WATER SERVICE AGREEMENT (this "Agreement") is entered into this 22nd day of December, 2004 (the "Effective Date"), between KEALIA WATER COMPANY HOLDINGS, LLC, a Delaware limited liability company (hereinafter, the "Water Company"), and KEALIA PLANTATION COMPANY, LLC, a California limited liability company (hereinafter, "KPC").

### RECITALS

A. KPC is the owner of certain real property situated in the County of Kauai (the "County"), State of Hawaii, more particularly described on *Exhibit A* attached hereto (the "KPC Parcels") and denoted as "Segment B Serviced Lands" on the map attached hereto as *Exhibit B* (the "Map").

B. The Water Company was established to access, construct, operate, maintain, repair, replace, improve and expand a potable water system, including, but not limited to, well facilities, pumps, water lines, pipes, treatment facilities, storage facilities, mechanical facilities, measuring devices, and other appurtenances associated with these structures (collectively, the "Infrastructure"), and to divert, treat and deliver potable water. The location of the Infrastructure is shown on the survey attached hereto as *Exhibit C* (the "Survey"). The Water Company holds title to all components of the Infrastructure which constitute personal property, including fixtures. A portion of the Infrastructure is located on the KPC Parcels, as shown on the Survey.

C. The Water Company has filed an application (the "PUC Application") with the Public Utilities Commission of the State of Hawaii (the "PUC") to place the Infrastructure and the water delivered through the Infrastructure under the governance and regulation of the PUC.

D. The Water Company was formed to provide potable water service to (i) property owned by Cornerstone Hawaii Holdings, LLC, a Colorado limited liability company ("CHH") (which property is described on *Exhibit D* attached hereto and is denoted as "Segment A Serviced Lands" on the Map (the "CHH Parcels")), (ii) the Kealia Kai subdivision (which property is described on *Exhibit E* attached hereto and is denoted as "Segment B Serviced Lands" on the Map (the "Kealia Kai Subdivision")), (iii) the KPC Parcels, and (iv) certain water users who reside in residences situated adjacent to Kuhio Highway which historically have been connected to the Infrastructure (the "Historical Water Users"). The Persons (as hereinafter defined) and parcels described in the foregoing clauses (i) through (iv) shall be hereinafter referred to collectively as the "Potable Water Users." In addition to the Potable Water Users, the Water Company may hereafter desire to additionally provide potable water service to future users within the Service Area (as defined in the "Rules," as hereinafter defined) of the Water Company, as such Service Area is designated and modified by the PUC from time to time (hereinafter "Other Water Users").

E. The Water Company and KPC desire to enter into this Agreement to set forth the manner and terms of potable water service to the KPC Parcels, as more particularly provided herein.

F. For purposes of this Agreement, KPC and successor owners of the KPC Parcels who seek to expand the Infrastructure (whether in connection with or to facilitate a Subdivision (as

hereinafter defined) or otherwise) shall be referred to herein individually as a "**Developer**" and collectively as the "**Developers**," and Persons who own or acquire legal parcels from a Developer for the purpose of constructing residences or other improvements thereon (excluding Subdivision improvements, such as roadways, utility lines, sewers and similar improvements which will be constructed by "Developers") and who establish Service Connections (as defined in the "Rules") with the Water Company shall be herein referred to individually as a "**Customer**" and collectively as "**Customers**." As used herein, "**Person**" means any individual, corporation, partnership, limited liability company, trust or other legal entity, or any governmental or quasi-governmental agency, department or body; and "**Subdivide**" and "**Subdivision**" refer to the act of legally dividing or parcelizing a parcel of land (whether pursuant to the Subdivision Ordinance (Chapter 9, Kauai County Code), the Condominium Property Act (Chapter 514A, Hawaii Revised Statutes) or otherwise). A Person who is a KPC Owner may be a "Developer," a "Customer" or both.

NOW, THEREFORE, in consideration of the promises and agreements set forth below, and for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Potable Water Service to KPC Parcels.

(a) The Water Company hereby agrees to provide potable water service to the KPC Parcels on the terms set forth in this Agreement. Pursuant to this Agreement, a daily aggregate amount of three hundred thousand (300,000) gallons of potable water per day (gpd) (the "**KPC Allocation**") from the Infrastructure shall be reserved for the benefit of and shall be available to KPC and the owner(s) of all or any portion of the KPC Parcels from time to time (KPC and such other owner(s) being collectively referred to herein as the "**KPC Owners**"), subject to expansion of the Infrastructure in accordance with Paragraph 4 below, at locations on the KPC Parcels designated by Developers. The KPC Allocation shall be subject to reduction only in accordance with Paragraph 2 below. The KPC Owners shall have the right to use potable water from the Water Company for both Residential and Non-residential (as such terms are defined in the Rules) purposes. The KPC Allocation shall be reserved solely for the benefit of the KPC Owners, and, except as specifically provided in Paragraph 1(c) below, the Water Company shall not make any portion of the KPC Allocation available to any Person other than a KPC Owner, irrespective of the actual quantity of potable water used by the KPC Owners from time to time.

(b) (i) As between KPC and the Water Company, KPC shall have the right, exercisable from time to time in its sole and absolute discretion, to allocate and apportion the KPC Allocation to and among Persons to whom KPC sells, transfers or otherwise conveys all or any portion of the KPC Parcels. Any such transferee itself shall have the right, exercisable from time to time in its sole and absolute discretion, to allocate and apportion its share of the KPC Allocation to and among Persons to whom it sells, transfers or otherwise conveys all or any portion of the KPC Parcels it has acquired. If a Person sells a portion of its land to another Person, then the first Person shall have the right to make an allocation to the second Person, and the second Person shall, in turn, have the right to make a further allocation (of its allocation) to Persons to whom it sells its KPC Parcels. Neither KPC nor any other Person shall assign or otherwise convey all or any portion of the KPC Allocation for or to benefit property which is not presently a part of the KPC Parcels. The allocations described in this subparagraph (i) shall be herein referred to as the "**Potable Water Allocations**".

(ii) Subject to the terms of this Agreement, the Water Company shall honor and abide by the Potable Water Allocations provided that the Person properly making the Potable Water Allocation provides written notice to the Water Company, in such form reasonably acceptable to the Water Company, that sets forth the name and address of the transferee and the amount of the Potable Water Allocation (each such notice being herein referred to as an "Allocation Notice").

(iii) KPC and any other Person who is the owner of the KPC Parcels in their entirety (but not any other Person, including, without limitation, any KPC Owners' Association (as hereinafter defined)) shall have the right, exercisable from time to time, to revise and adjust any Potable Water Allocation(s) it has made in accordance with this Paragraph 1(b). Any such adjustment by KPC or such other Person shall be effective upon at least sixty (60) days' written notice (each such notice being herein referred to as a "Reallocation Notice") to the Water Company and the affected KPC Owner(s). KPC and any other such Person who provides a Reallocation Notice to Water Company hereby agrees to indemnify, defend and hold harmless the Water Company from and against any and all claims, costs (including, without limitation, reasonable attorneys' fees) and liabilities actually incurred by the Water Company in complying with the instructions contained in a Reallocation Notice, including, without limitation, any claims asserted by a KPC Owner whose Potable Water Allocation has been adjusted pursuant to such Reallocation Notice.

(iv) KPC and any other Person who provides an Allocation Notice or Reallocation Notice to the Water Company agrees to pay the Water Company's reasonable administrative costs and expenses to amend its books and records and take such other measures to reflect the Allocation Notice or the Reallocation Notice.

(c) Notwithstanding the terms of Paragraph 1(a) above, in the event a KPC Owner shall hereafter drill a well (each, a "KPC Well") on a portion of the KPC Parcels for the purpose of providing potable water service to residences constructed on such or other portions of the KPC Parcels, then such KPC Owner shall provide written notice to the Water Company designating the residences to be served by such KPC Wells (the "Designated Residences") at least ninety (90) days prior to the commencement of potable water service to the Designated Residences from such KPC Wells. During the period that the Designated Residences receive potable water service from such KPC Wells, and provided that KPC (and, if different, the Developer who has made a Potable Water Allocation to the parcel(s) on which such Designated Residence(s) are situated), does not and in the future will not require, in its good faith discretion, potable water service from the Water Company in the full amount of the KPC Allocation (or, as to a Developer, the Potable Water Allocation it has received), for the KPC Parcels (or, as to a Developer, the KPC Parcels it previously acquired), then the Designated Residences shall not be entitled to receive potable water from the Water Company, and the aggregate KPC Allocation (and, if applicable, the Potable Water Allocation made to the particular Developer) shall be reduced by an amount determined by multiplying the number of Designated Residences receiving potable water from such KPC Wells by the average daily usage of potable water by a detached single family residence on the Island of Kauai, as published from time to time by the Kauai Department of Water.

(d) No KPC Owner shall drill a potable water well within six hundred (600) feet of the potable water wells operated by the Water Company.

2. Deficit in Water Available for Delivery Due to Insufficient Supply. The Water Company shall not take any actions to reduce the amount of potable water available from the Infrastructure, except as may be required by law or for the safe and prudent operation of the Infrastructure, as reasonably determined in good faith by the Water Company. If at any time, due to unavailability of sufficient water supply, as a result of drought, other natural conditions, equipment problems or other problems beyond the reasonable control of the Water Company, the capacity of potable water available from the Infrastructure (the "**Available Potable Water**") is less than Nine Hundred Thirty-six Thousand (936,000) gallons per day (the "**Deemed Capacity**"), and if the Available Potable Water is insufficient to serve the then-actual needs of the Potable Water Users, then during such times the potable water provided to the Potable Water Users shall be reduced in the following manner. The KPC Owners, as a group, and CHH and its successors and assigns, as a group, shall each be entitled to an allocation of potable water determined by multiplying the Available Potable Water by a fraction, the numerator of which is Three Hundred Thousand (300,000) and the denominator of which is the Deemed Capacity. The Water Company shall have the right to allocate the remaining Available Potable Water to the Potable Water Users and Other Water Users in the Water Company's discretion.

3. Equipment Failure. In the event that any or all of the pumps and/or tanks are no longer operational and require replacement, the Water Company may install smaller pumps and/or tanks than those being replaced, if such new equipment can adequately serve the customers of the Water Company, including the KPC Owners, at the time of replacement, regardless of whether KPC has used all or any portion of the KPC Allocation; provided, however, that if the Water Company installs smaller pumps and/or tanks and if larger pumps and/or tanks are subsequently needed in order for the Water Company to fulfill a later request by KPC Owners for additional potable water, the Water Company shall install such larger pumps and/or tanks and other necessary equipment (or upgrade the existing pumps, tanks and equipment, as applicable) at KPC's expense as necessary to provide the additional water to the KPC Owners. The cost of any equipment over and above that needed to fulfill the requests of the KPC Users and the existing user's needs shall be borne by the Water Company.

4. Infrastructure Expansion.

(a) Notwithstanding the provisions of Paragraph 1 above, the parties acknowledge that the current Infrastructure needs to be expanded (meaning, for example, that additional diversion facilities, distribution lines, pipes and other equipment need to be installed) to deliver the KPC Allocation of water to the KPC Owners and the KPC Owners shall have the right to draw water from the Infrastructure in accordance with this Agreement and the Rules. In order to draw water from the Infrastructure, the KPC Owners will have to expand the Infrastructure in accordance with this Agreement and the Rules (an "**Expansion**").

(b) Any construction related to an Expansion shall be performed by a duly licensed contractor (the "**Contractor**") selected by the Developer and approved by the Water Company, which approval shall not be unreasonably withheld, conditioned or delayed. Water Company hereby approves Goodfellow Brothers, Inc. as a Contractor to construct Expansions. The Parties

agree that any such Expansion for any KPC Owner shall be accomplished in accordance with the Rules as applied in a reasonable manner such that the Expansion shall not be unreasonably burdened, conditioned or delayed.

(c) Notwithstanding anything in the Rules or this Agreement to the contrary, the Water Company shall not require any Developer to pay any Water System Facilities Charge (as defined in the Rules) until the earlier of: (i) the date the Developer has listed with a realtor and/or advertised one or more Subdivided lots for sale, lease or exchange, and then only for the number of lots offered for sale, lease or exchange; or (ii) the date the Developer completes the Expansion and requires potable water for one or more KPC Parcels or Subdivided lots, and then only for the number of KPC Parcels or subdivided lots requiring potable water.

5. Dedication of Infrastructure. If the Water Company elects to dedicate or otherwise transfer or convey the Infrastructure to the County or any other Agency, and if the Water Company is required to upgrade or make improvements to the Infrastructure or any Expansion as a condition to or in connection with such dedication, transfer or other conveyance, then the Developers and, if necessary, Customers, shall execute such reasonable documents and take such other reasonable actions as the Water Company or any such Agency may reasonably request to effectuate such transfer; provided, however, that no KPC Owner shall be required to incur any costs, execute any deeds or grant any additional easements or other interests to any Person in connection with any such transfer or conveyance.

6. Will Serve Letter. If a KPC Owner elects to Subdivide any KPC Parcel, the Water Company agrees to provide such KPC Owner with a letter committing to provide potable water to such KPC Owner's parcels, subject to standard and customary terms and conditions consistent with this Agreement and the Rules.

7. Water Costs. Customers shall pay water usage charges to the Water Company for the provision of potable water at the rates approved by the PUC or pursuant to contracts approved by the PUC.

8. KPC Owners' Association.

(a) In the event that the KPC Parcels shall be Subdivided or otherwise sold or conveyed such that there shall actually be more than three (3) KPC Owners, then during the period that there is more than three (3) KPC Owners, the KPC Owners shall form an owners' association or other body (the "**KPC Owners' Association**") which shall have the authority to exercise the rights and make the elections provided to KPC under this Agreement, excluding only the rights expressly reserved under Paragraph 1(b)(iii) above to KPC and a Person who acquires the KPC Parcels in their entirety.

(b) The KPC Owners (or a Person designated by the KPC Owners' Association) shall provide the Water Company with written notice of the formation of the KPC Owners' Association, and from and after the date of receipt of such written notice the Water Company may rely on instructions from the KPC Owners' Association with respect to the matters described above. The KPC Owners shall remain liable for their respective obligations under this

Agreement notwithstanding the formation of any KPC Owners' Association pursuant to this Agreement.

(c) Notwithstanding the foregoing, in the event KPC shall hereafter elect to convey the KPC Parcels to one or more legal entities controlled directly by KPC (each, a "**KPC-Controlled Entity**"), then such entities shall not be deemed separate KPC Owners for purposes of this Paragraph 8 for so long as KPC directly controls such entities. For purposes of this Agreement, "control" shall mean the ownership of a majority of the voting interests of such entity and the right to elect a majority of the managers, directors, partners or other similar fiduciaries that govern such entity. KPC shall provide written notice to the Water Company prior to or after transferring any KPC Parcel to any such KPC-Controlled Entity, and KPC and its owners shall certify to the Water Company in writing that KPC controls such entity. Solely for purposes of the rights reserved to KPC pursuant to Paragraph 1(b)(iii) above, portions of the KPC Parcels owned by a KPC-Controlled Entity shall be deemed to be owned by KPC itself.

9. Continuation of Potable Water Rights. The terms and provisions of this Agreement and the rights to potable water granted hereunder shall not be affected in any manner by any grant or conveyance by KPC (or successor KPC Owner(s)) of fee title to the Potable Water Parcels to the Water Company as potentially provided for in the Grant of Easements dated as of even date herewith between KPC and the Water Company (the "**Grant of Easements**").

10. Rules and Regulations. As part of the PUC Application, the Water Company has filed proposed rules and regulations with the PUC which will govern the service of potable water to the customers of the Water Company. The rules and regulations, as approved by the PUC and as modified, supplemented or amended from time to time, shall be herein referred to as the "**Rules**". Notwithstanding anything herein or in the Rules to the contrary, in no event shall the Rules be interpreted, construed, enforced or applied in a manner so as to defeat, interrupt or interfere with the KPC Owners' right to the KPC Allocation in accordance with Paragraph 1(a) above (subject only to reduction in accordance with and to the extent provided in Paragraph 2 above) and the Developers' right to expand the Infrastructure in accordance with Paragraph 4 above so as to receive dependable supplies and adequate capacities of potable water at locations on the KPC Parcels designated by the Developers. In the event of any inconsistency between the terms of this Agreement and the Rules, the terms of this Agreement shall prevail.

11. Miscellaneous Provisions.

(a) This Agreement and the Grant of Easements contain the final and entire agreement between the parties hereto with respect to the subject matter hereof and no party shall be bound by any terms, conditions, statement or representations, oral or written, which are not expressly described herein.

(b) Any amendment to this Agreement shall be valid only if executed in writing by the Water Company, or its successors, and by KPC (or, after KPC has sold, transferred or otherwise conveyed the entirety of the KPC Parcels, the successor owner(s) of the KPC Parcels; provided, however, that if KPC has sold, transferred or otherwise conveyed any of the KPC Parcels and if a KPC Owners' Association has been formed pursuant to Paragraph 8 above, then this Agreement may be modified in writing by the Water Company, or its successors, and the

KPC Owners' Association), except that no such modification executed by the KPC Owners' Association shall be effective to diminish or otherwise affect the rights expressly reserved pursuant to Paragraph 1(b)(iii) above to KPC and a Person who acquires the KPC Parcels in their entirety. As used in this Agreement, the singular shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

(c) This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns (including, as to KPC, all KPC Owners), subject to the rights expressly reserved to KPC pursuant to Paragraph 1(b)(iii) above.

(d) The term "KPC Owners" as used in this Agreement means, from time to time, the then current owner(s) of the KPC Parcels, so that, in the event of any sale of the KPC Parcel(s) owned by a KPC Owner, such KPC Owner shall be and hereby is entirely freed and relieved of all covenants and obligations of such KPC Owner hereunder with respect to portions of the KPC Parcels so sold arising from and after the date of the sale, and it shall be deemed and construed, without further agreement between the parties and the purchaser at any such sale, that the purchaser has assumed and agreed to carry out any and all obligations of the transferring KPC Owner hereunder with respect to the portions of the KPC Parcels acquired by such purchaser. No such sale shall release KPC from any obligations hereunder arising or accruing prior to the date of sale.

(e) The provisions of this Agreement shall be deemed to be cumulative. No provision of this Agreement shall be deemed to be a limitation of or to exclude any other provision hereof, or any right to any remedy provided by law unless otherwise expressly stated. The captions of this Agreement are inserted only for the purpose of convenient reference and in no way define, limit or prescribe the scope or intent of this Agreement, or any part hereof.

(f)

(g) The parties to this Agreement recognize and agree that, to the extent permitted by the PUC and applicable law, the Water Company has the right to enforce its Rules. Additionally, in the event that any Potable Water User or any Person who has purchased or leased a portion of the KPC Parcels materially violates the terms of this Agreement or the Rules, the Water Company shall have all remedies available to it at law or in equity. Without limiting the foregoing rights and remedies, KPC, and its successors and assigns, agree that, to the extent permitted by the PUC and applicable law, the Water Company may also enforce such material violations by either curtailing potable water service to the defaulting Person during the period of such violation or breach, or by injunction, the parties agreeing that the damages to the Water Company from such violations are irreparable, and there is no adequate remedy at law for such violations. The Water Company shall be free from any liability arising out of the exercise of its rights under this paragraph. Notwithstanding the foregoing provisions of this paragraph, (i) if any KPC Owner (or any lessee thereunder) commits a violation with regard to water delivered to its or his owned or leased property, only that individual KPC Owner's or lessee's water service shall be disconnected, and enforcement actions will be directed toward that violator, and not toward those who are not violating this Agreement, and (ii) the Water Company shall not exercise any rights or remedies against any party upon a default hereunder without first providing such party written notice of such default and a period of thirty (30) days to cure the



same; provided, however, that if due to the nature of such default the same cannot reasonably be cured within such thirty (30) day period, then the defaulting party shall have such additional time as shall be reasonably required to effect the cure, provided that the defaulting party commences the cure within such thirty (30) day period and thereafter diligently prosecutes the same to completion.

(h) If a dispute arises out of or relates to this Agreement or the breach thereof and if the dispute cannot be settled through negotiation, the parties agree first to try in good faith to settle the dispute by mediation administered by the American Arbitration Association under the Commercial Mediation Procedures before resorting to arbitration, litigation or some other dispute resolution procedure.

(i) In the event of any litigation between the parties arising under or related to this Agreement, the prevailing party shall be entitled to recover from the other its costs and expenses including reasonable attorney fees, incurred in connection therewith.

(j) If any provision of this Agreement shall be or become invalid or unenforceable, the remainder of the provisions of this Agreement shall not be affected thereby, and each and every provision shall be enforceable to the fullest extent permitted by law.

(k) The parties acknowledge and represent to each other that all procedures necessary to validly contract and execute this Agreement have been performed and that the persons signing for each party have been duly authorized to do so.

(l) This Agreement may be signed using counterpart signature pages, with the same force and effect as if all parties signed on the same signature page.

(m) Nothing set forth in this Agreement shall create or be deemed to create any real property rights or interests, and it is the parties' intent solely to create contractual rights and obligations under this Agreement.

(n) The Water Company may assign its rights and obligations hereunder, in whole but not in part, to any Person which acquires all or substantially all the assets of the Water Company, specifically including all of the Water Company's right, title and interest in the Grant of Easements and the Infrastructure, provided that such assignee shall assume in writing all obligations of the Water Company hereunder arising from and after the date of such assignment. The Water Company shall notify KPC in writing in advance of making any such assignment. In the event of any assignment of the Water Company's rights and obligations hereunder, the assignee shall be considered the "Water Company" for all purposes hereunder, and the Water Company named herein shall be and hereby is entirely freed and relived of all covenants and obligations of the Water Company hereunder arising from and after the date of the assignment, provided that the assignee assumes and agrees, in writing, to carry out any and all obligations of the Water Company hereunder. No such assignment shall release the Water Company from any obligations hereunder arising or accruing prior to the date of assignment.


(o) Without limiting the terms of Paragraph 11(n) above, the Water Company's rights and obligations hereunder shall at all times be held by the same Person who owns the Infrastructure and substantially all the other assets of the Water Company, including the interest

of the Water Company under the Grant of Easements. Any assignment or purported assignment of this Agreement without a concurrent transfer and assignment to the same assignee of the Infrastructure, the Grant of Easements and the other assets of the Water Company shall be void and of no force or effect.

IN WITNESS WHEREOF, the undersigned has hereunto set its hand and seal the day and year first written above.

*KPC:* KEALIA PLANTATION COMPANY, LLC,  
a California limited liability company

By: \_\_\_\_\_

  
Justin Hughes  
Manager

*WATER COMPANY:* KEALIA WATER COMPANY HOLDINGS LLC,  
a Delaware limited liability company

By: Cornerstone Hawaii Holdings LLC,  
a Colorado limited liability company,  
Manager

By: \_\_\_\_\_

Thomas D. McCloskey, Jr.  
Manager

of the Water Company under the Grant of Easements. Any assignment or purported assignment of this Agreement without a concurrent transfer and assignment to the same assignee of the Infrastructure, the Grant of Easements and the other assets of the Water Company shall be void and of no force or effect.

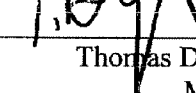
IN WITNESS WHEREOF, the undersigned has hereunto set its hand and seal the day and year first written above.

*KPC:* KEALIA PLANTATION COMPANY, LLC,  
a California limited liability company

By: \_\_\_\_\_  
Justin Hughes  
Manager

*WATER COMPANY:* KEALIA WATER COMPANY HOLDINGS LLC,  
a Delaware limited liability company

By: Cornerstone Hawaii Holdings LLC,  
a Colorado limited liability company,  
Manager

By:  \_\_\_\_\_  
Thomas D. McCloskey, Jr.  
Manager

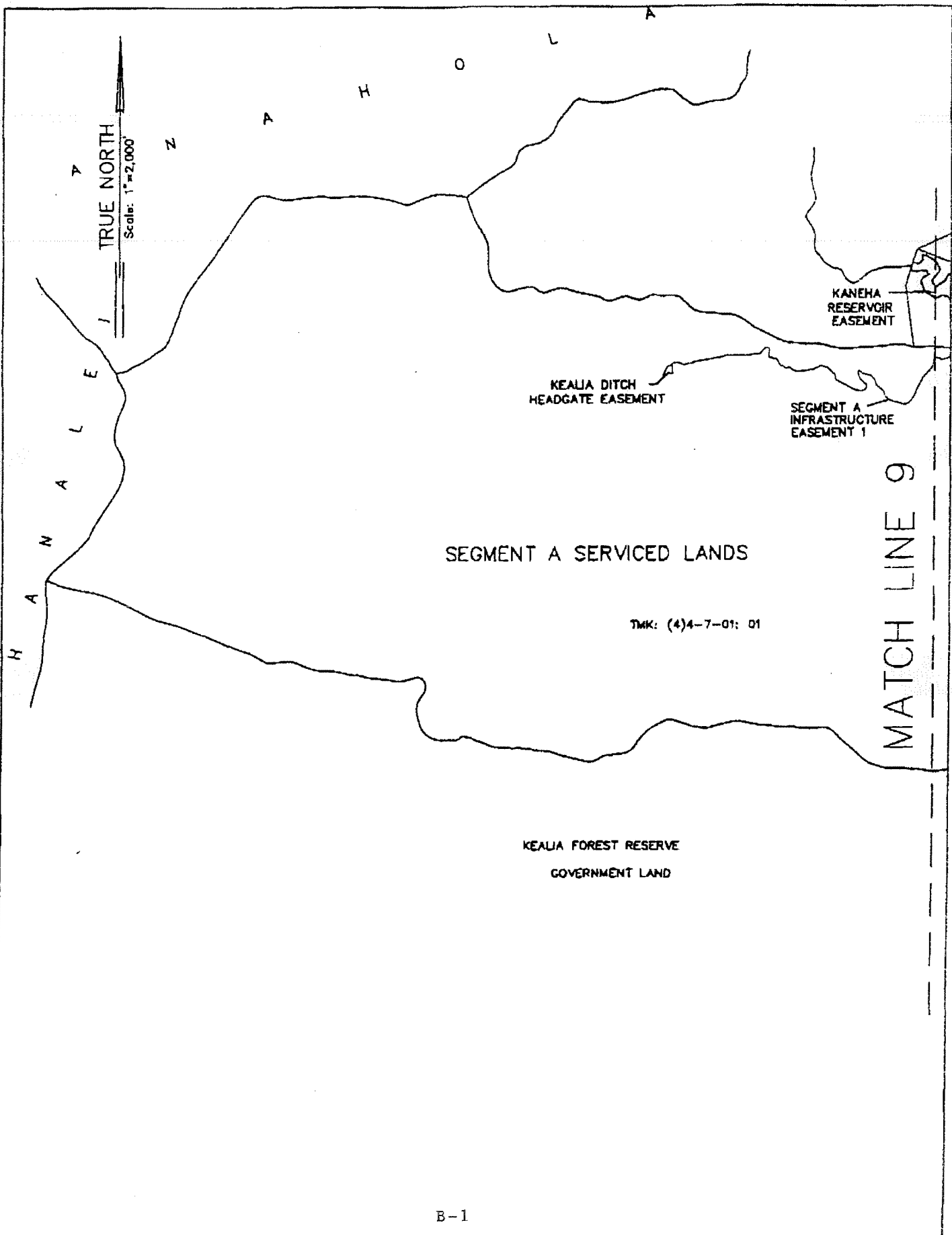
**EXHIBIT A**  
**TO WATER SERVICE AGREEMENT**

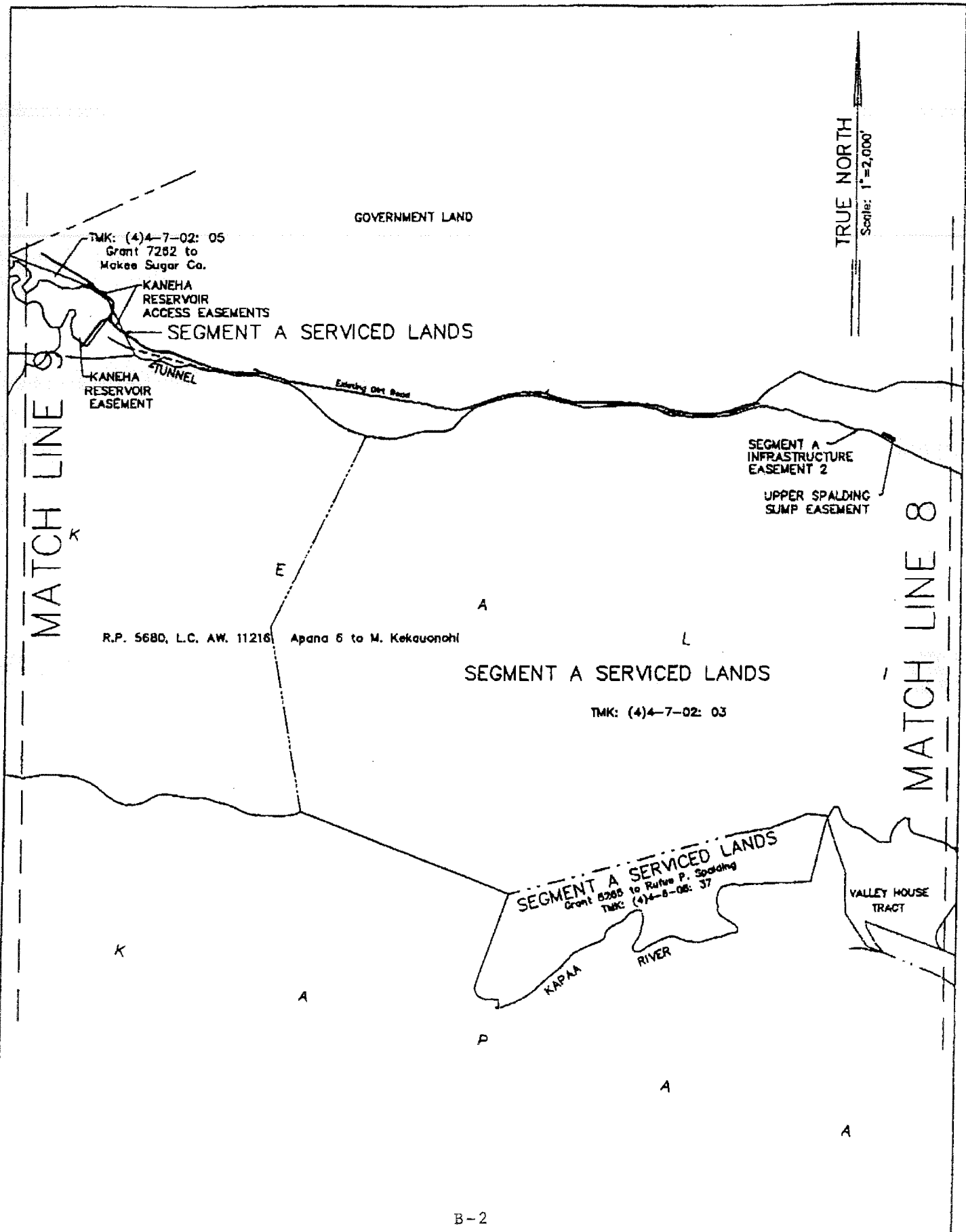
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**EXHIBIT B**  
**TO WATER SERVICE AGREEMENT**

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MAP







TRUE NORTH  
Scale: 1"=2,000'

MATCH LINE 8

SPALDING MONUMENT

TMK: (4)4-7-04: 01

SEGMENT B SERVICED LANDS

SEGMENT B INFRASTRUCTURE EASEMENT 1

HALAULA RESERVOIR EASEMENT

SEGMENT B INFRASTRUCTURE EASEMENT 2

SEGMENT B SERVICED LANDS

TMK: (4)4-7-03: 02

Segment B Infrastructure in County R.O.W

SEGMENT B INFRASTRUCTURE EASEMENT 3

filtration station

well site

K U M  
Grant J I S B U K E U K R U I I U

KUHIO HIGHWAY

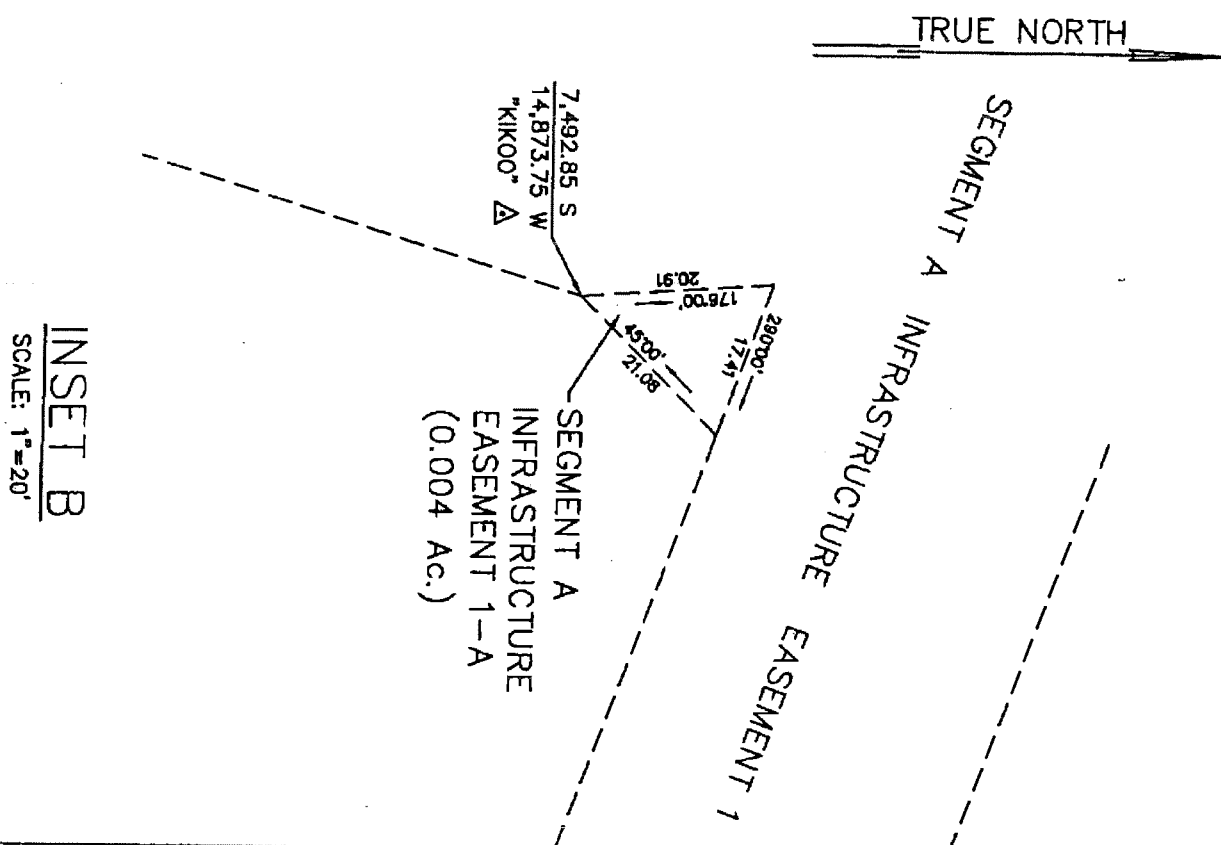
SEGMENT C INFRASTRUCTURE EASEMENTS  
SEGMENT C SERVICED LANDS

**EXHIBIT C**  
**TO WATER SERVICE AGREEMENT**

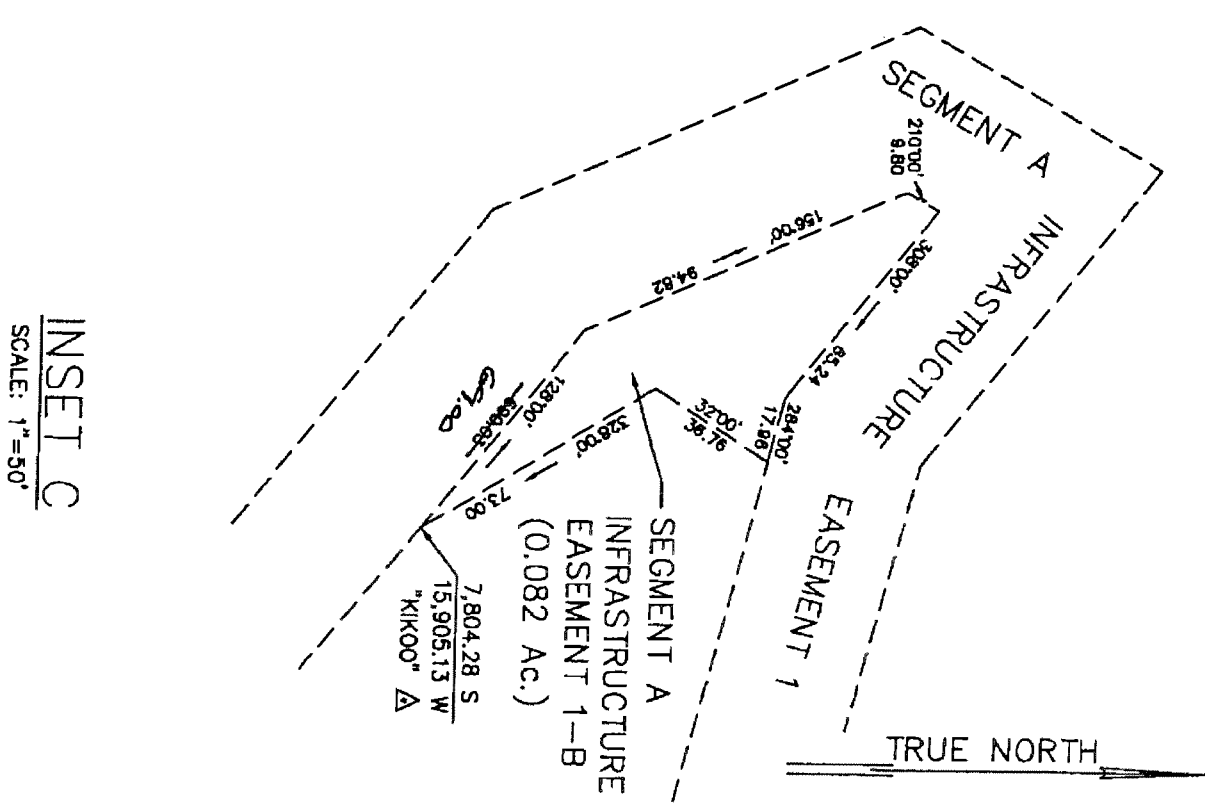
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**SURVEY OF THE INFRASTRUCTURE**





**INSET B**  
SCALE: 1"=20'



**INSET C**  
SCALE: 1"=50'

# SEGMENT A SERVICED LANDS

KEALIA DITCH  
HEADGATE EASEMENT  
(0.287 Ac.)  
SEE INSET F

SEGMENT A  
INFRASTRUCTURE  
EASEMENT 1

KEALIA DITCH  
HEADGATE EASEMENT  
(0.287 Ac.)

INSET F  
SCALE: 1"=100'

SEGMENT A  
INFRASTRUCTURE  
EASEMENT 1-D  
(0.059 Ac.)  
SEE INSET E

SEGMENT A  
INFRASTRUCTURE  
EASEMENT 1-C  
(0.104 Ac.)  
SEE INSET D

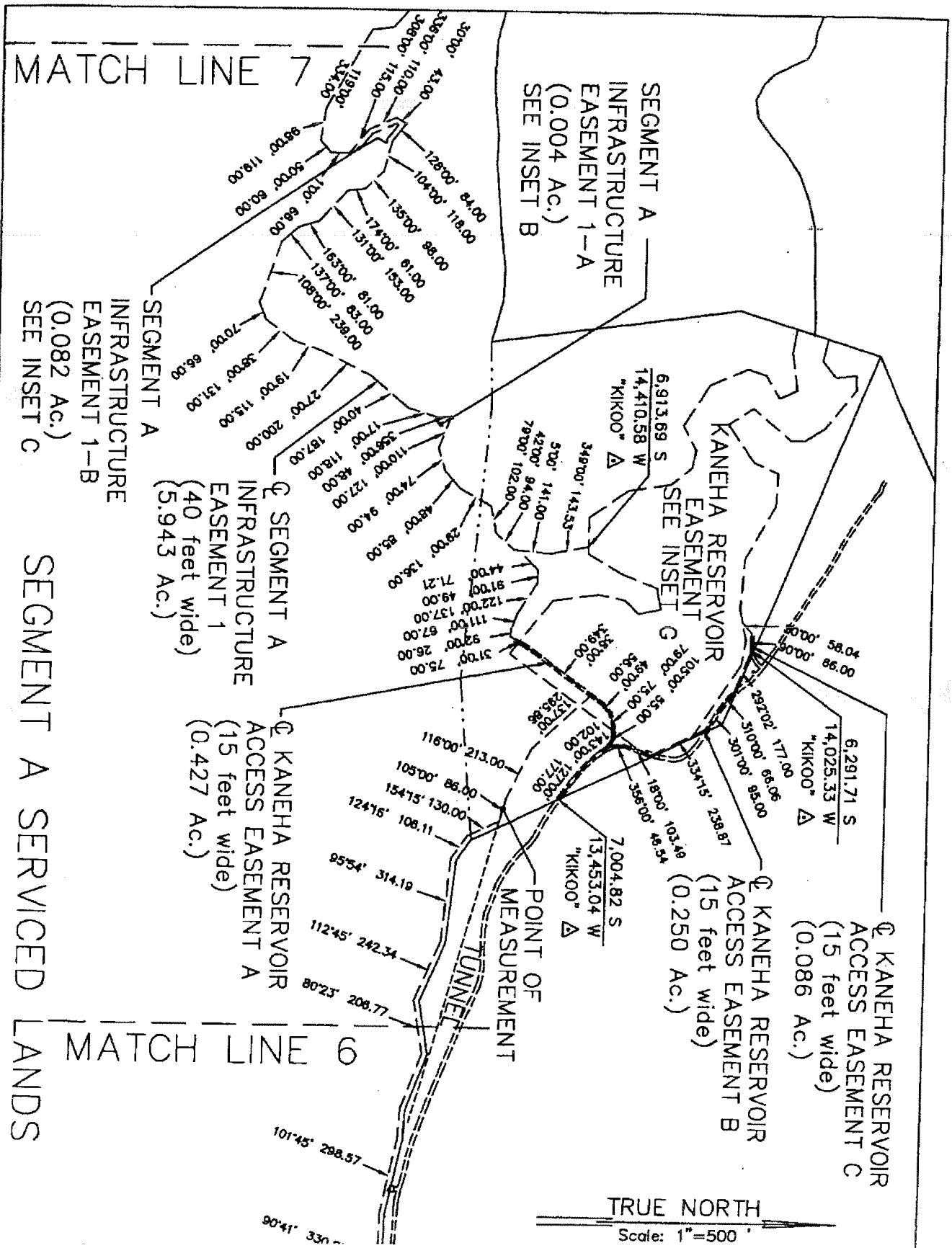
SEGMENT A  
INFRASTRUCTURE  
EASEMENT 1  
(40 feet wide)  
(5.943 Ac.)

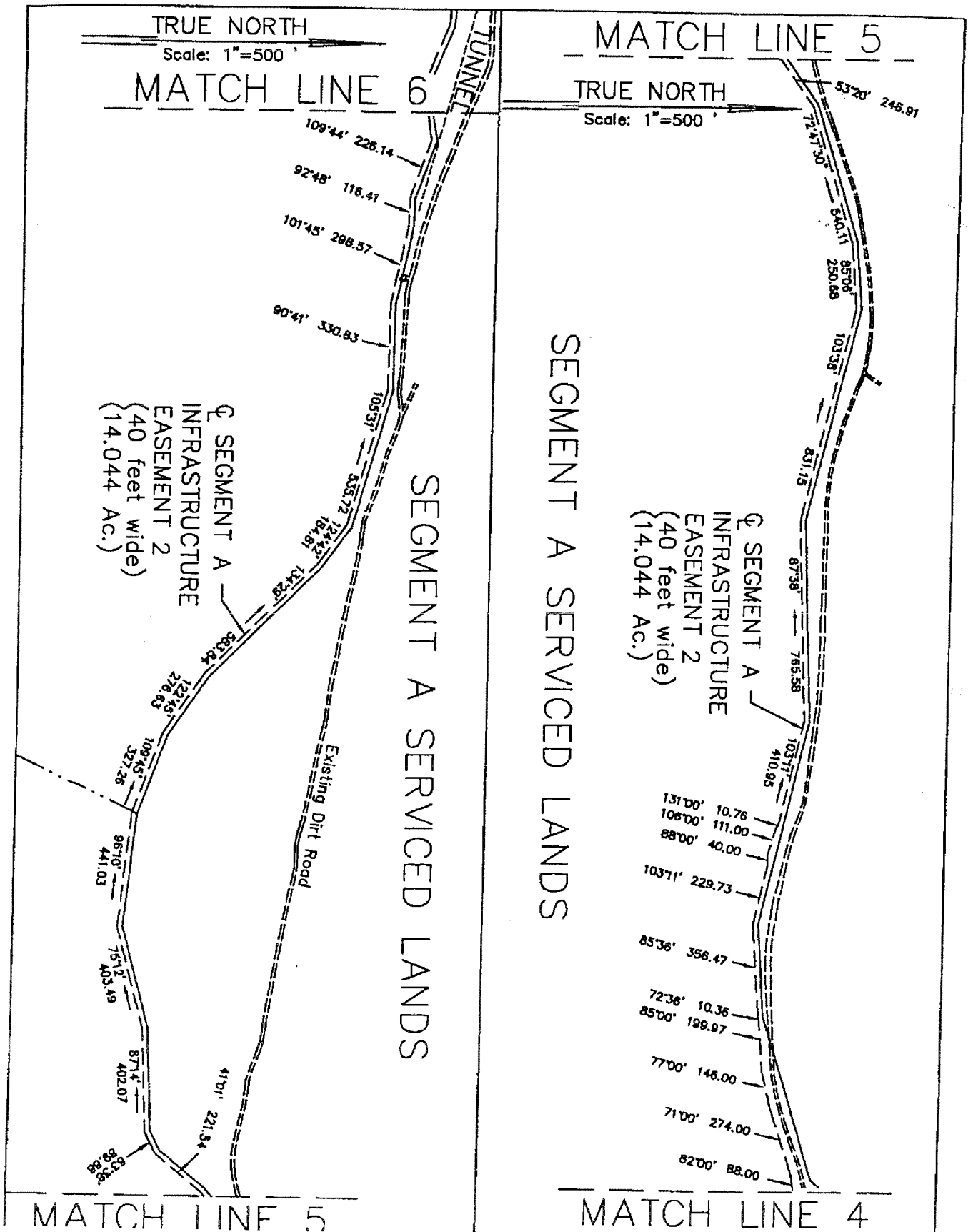
SEGMENT A INFRASTRUCTURE EASEMENT 1-D  
SEGMENT A INFRASTRUCTURE EASEMENT 1

INSET E  
SCALE: 1"=50'

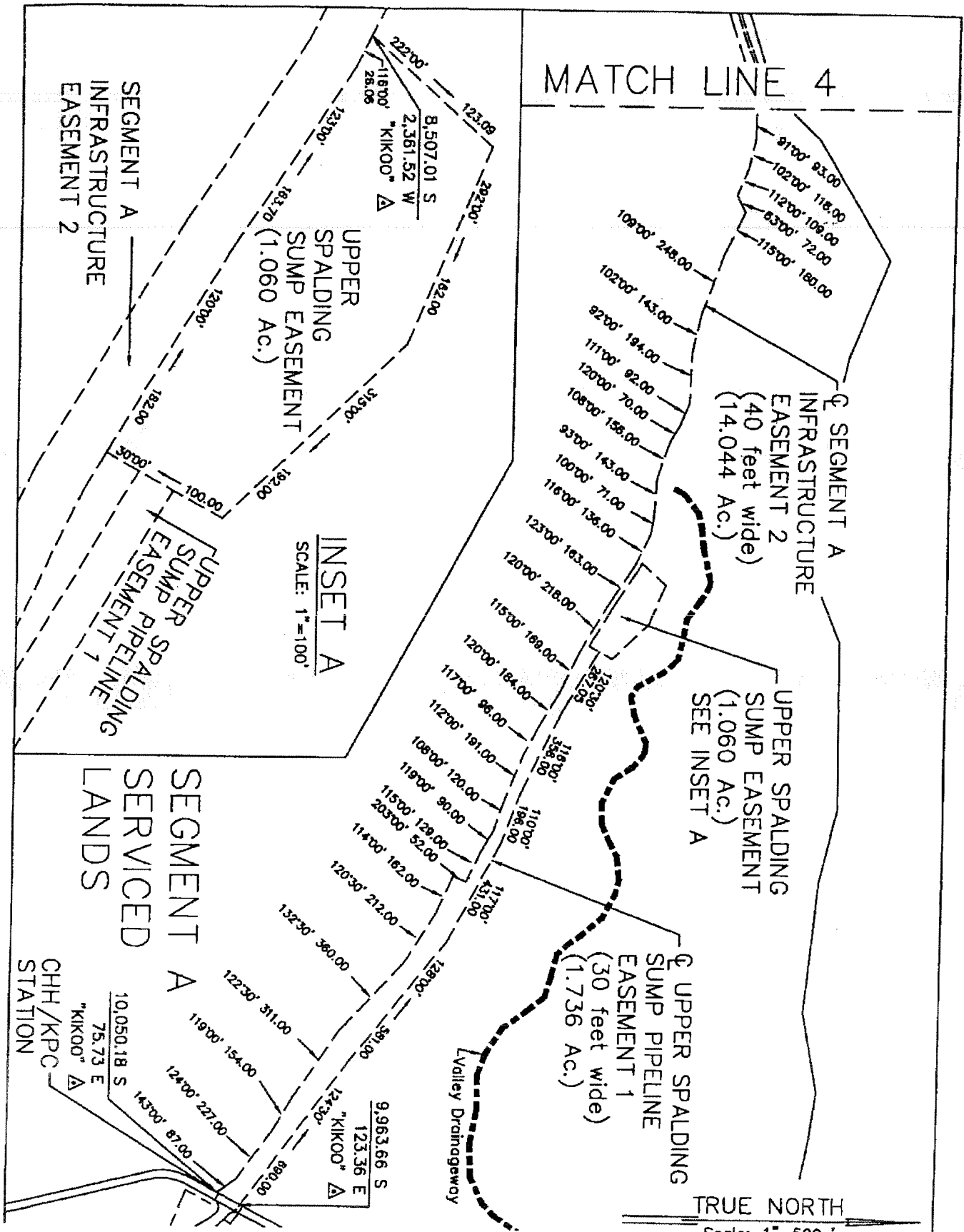
MATCH LINE 7

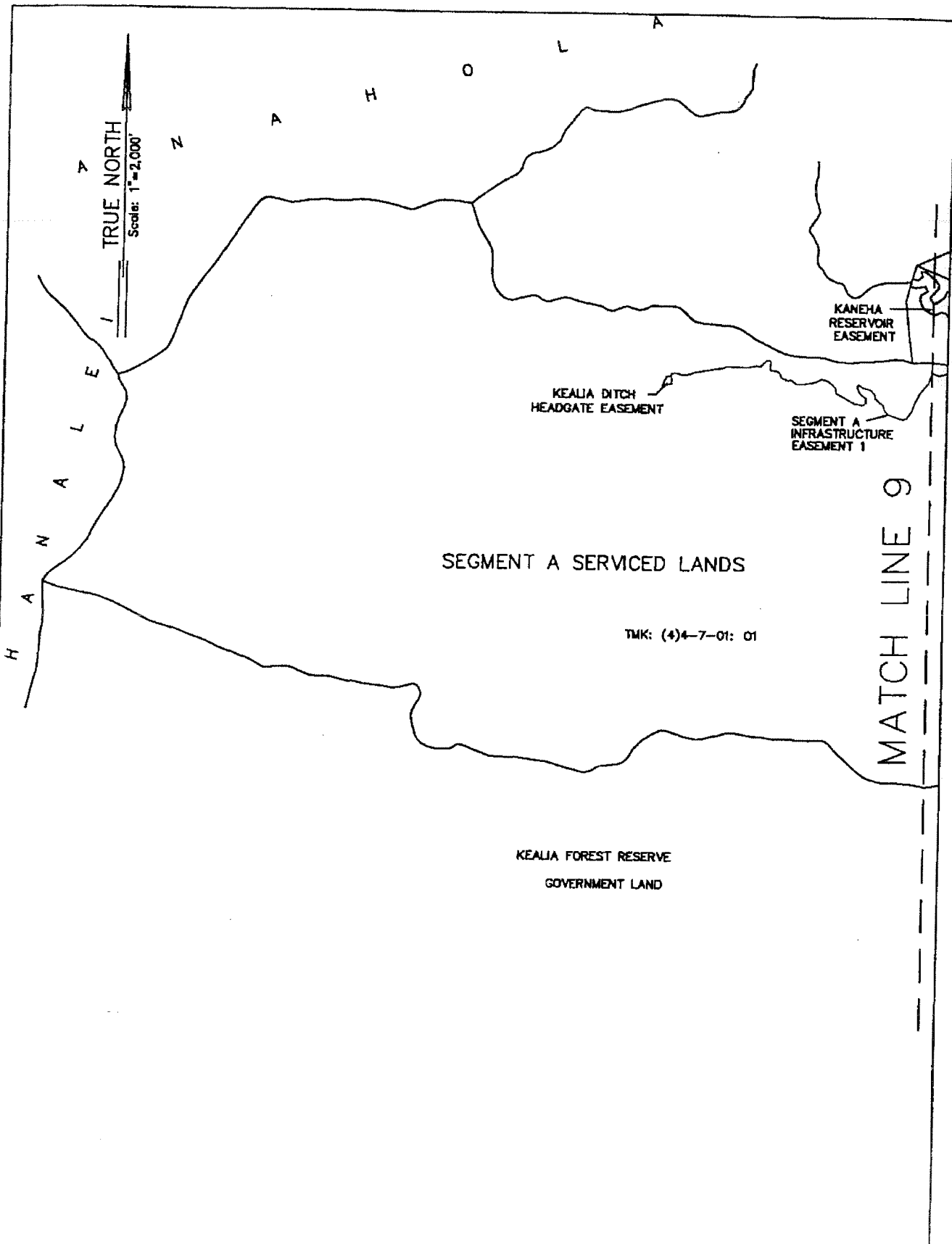
TRUE NORTH

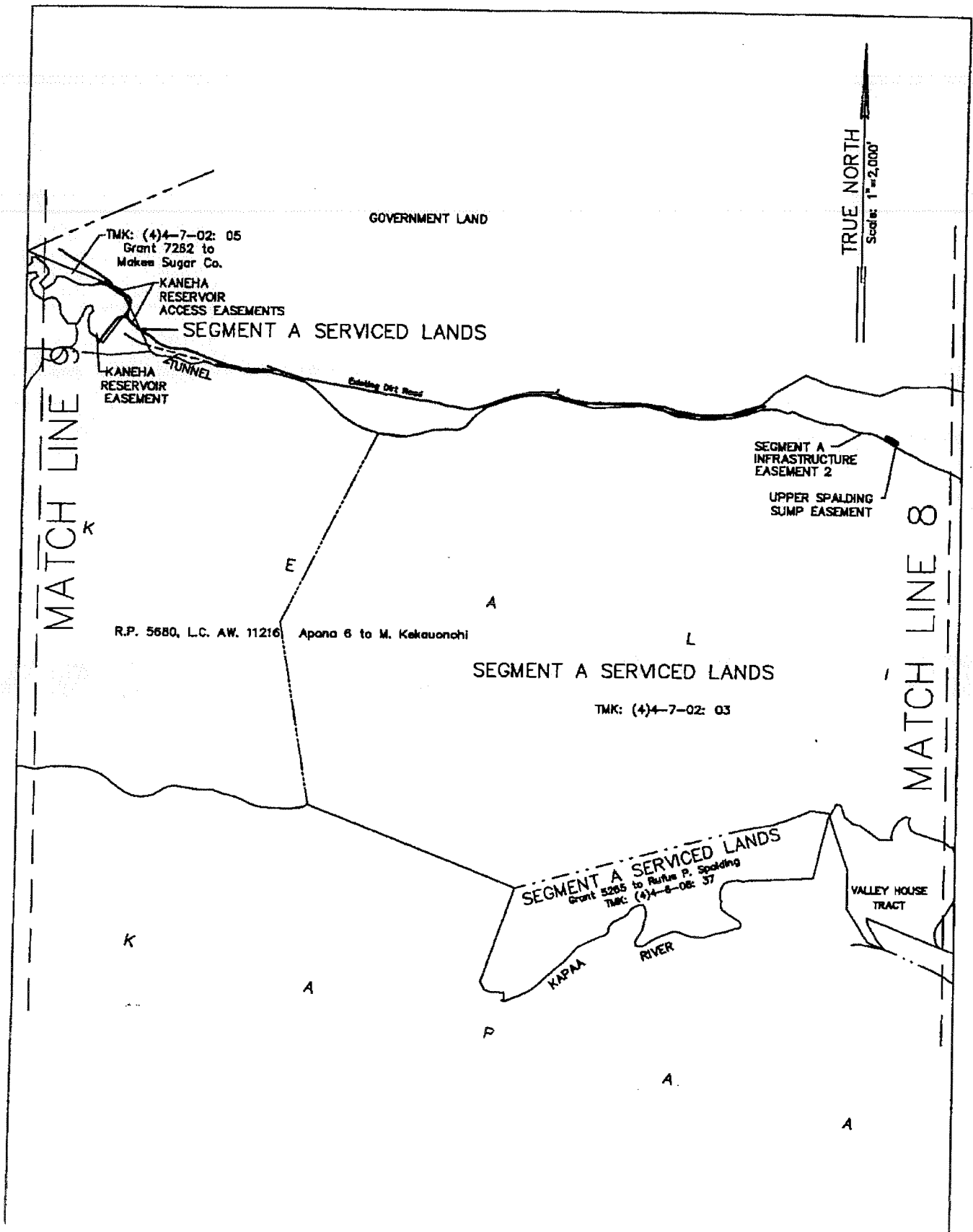


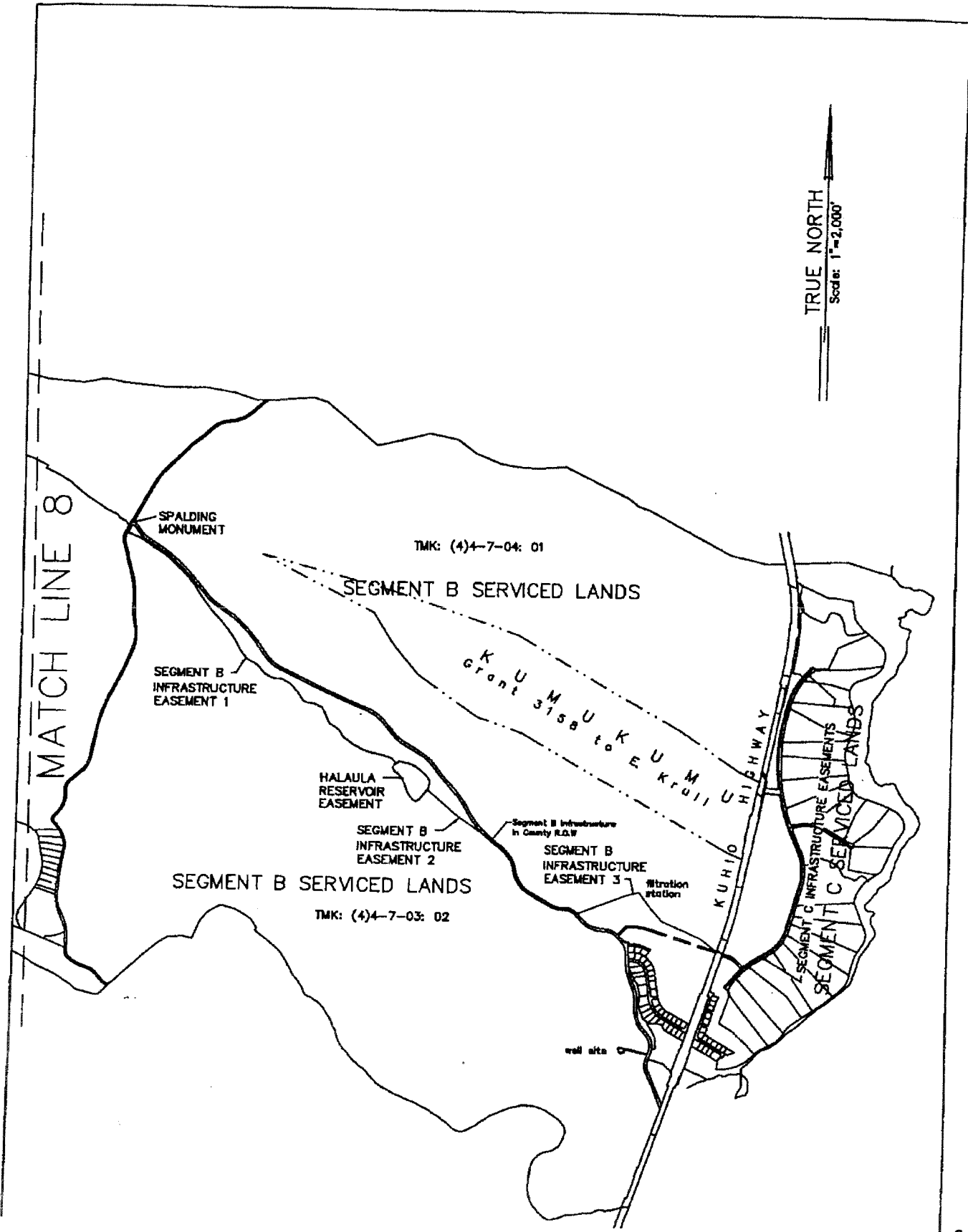












TMK: (4)4-7-04: 01

SEGMENT B SERVISED LANDS

SEGMENT B  
INFRASTRUCTURE  
EASEMENT 1

HALAULA  
RESERVOIR  
EASEMENT

SEGMENT B  
INFRASTRUCTURE  
EASEMENT 2

SEGMENT B SERVISED LANDS

TMK: (4)4-7-03: 02

Segment B Infrastructure  
in County R.O.W.

SEGMENT B  
INFRASTRUCTURE  
EASEMENT 3

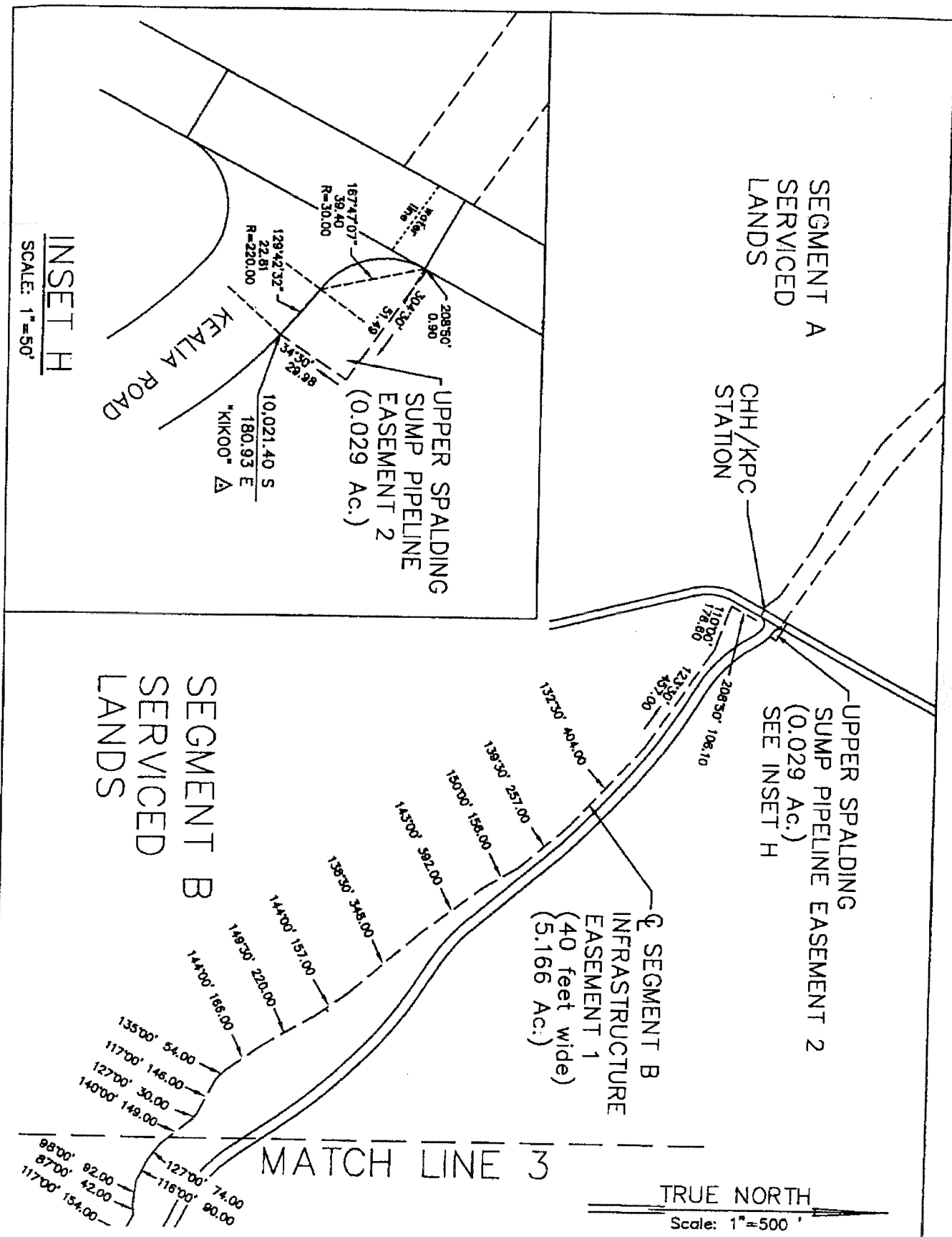
filtration  
station

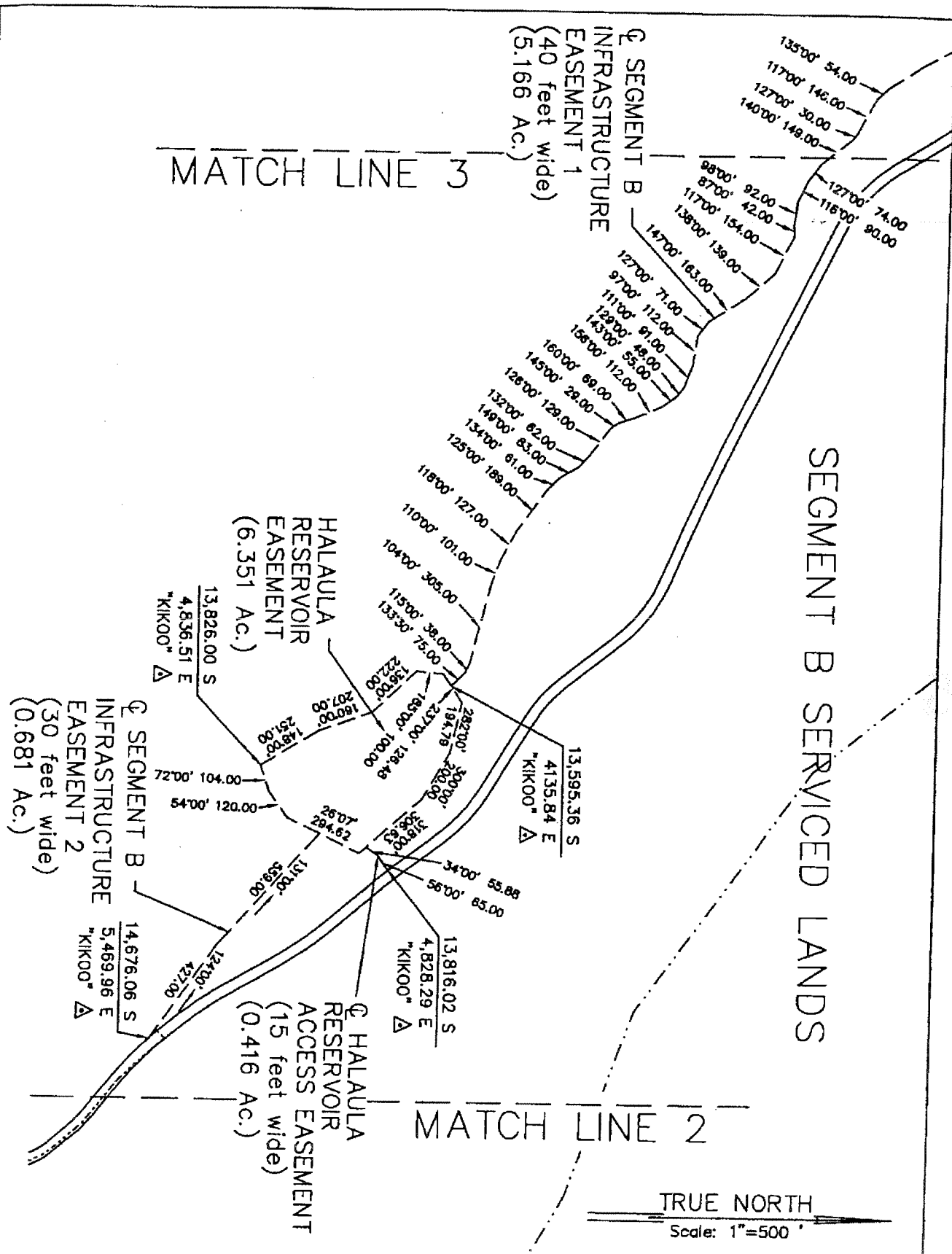
well site C

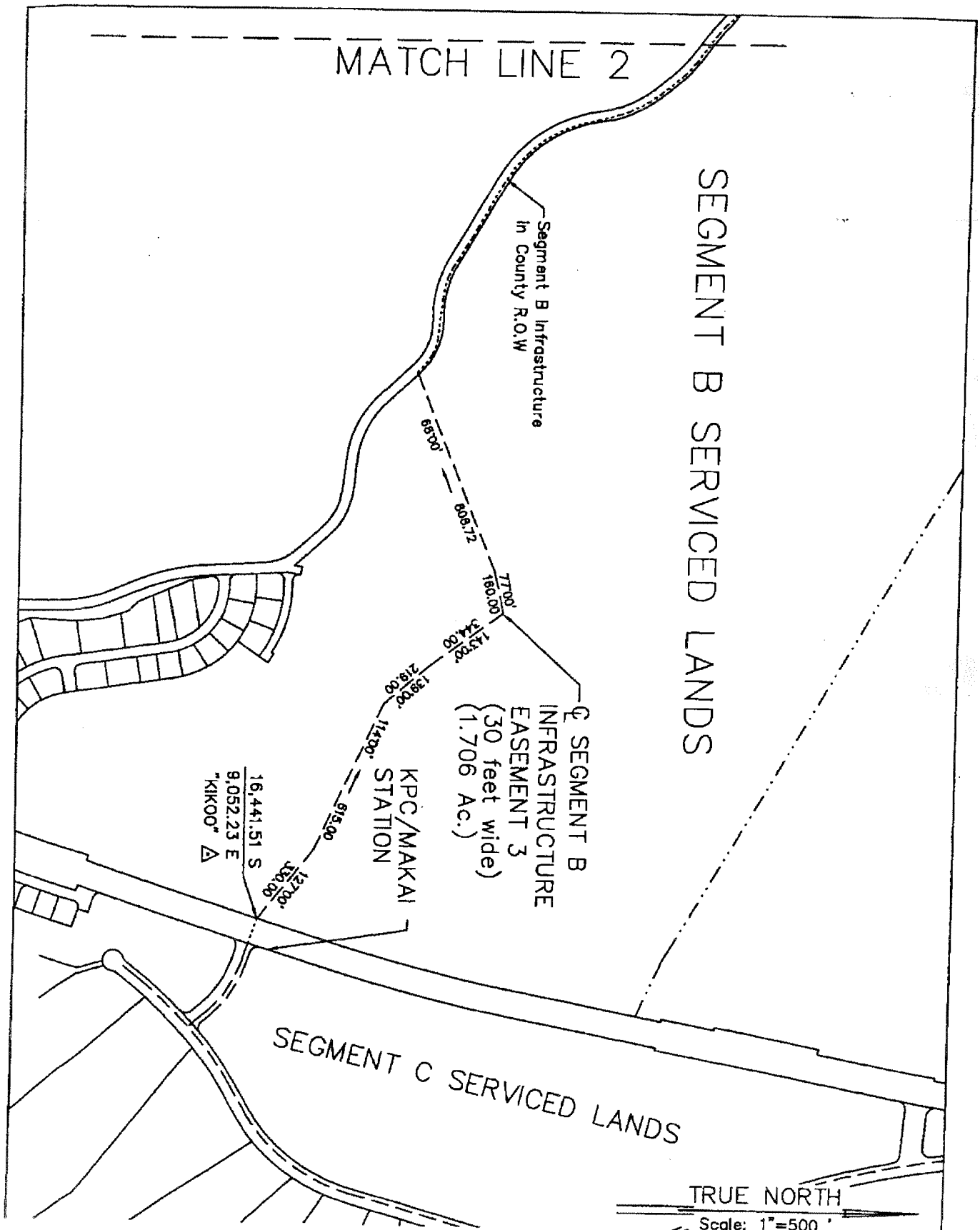
TRUE NORTH  
Scale: 1"=2,000'

KUHIO  
HIGHWAY

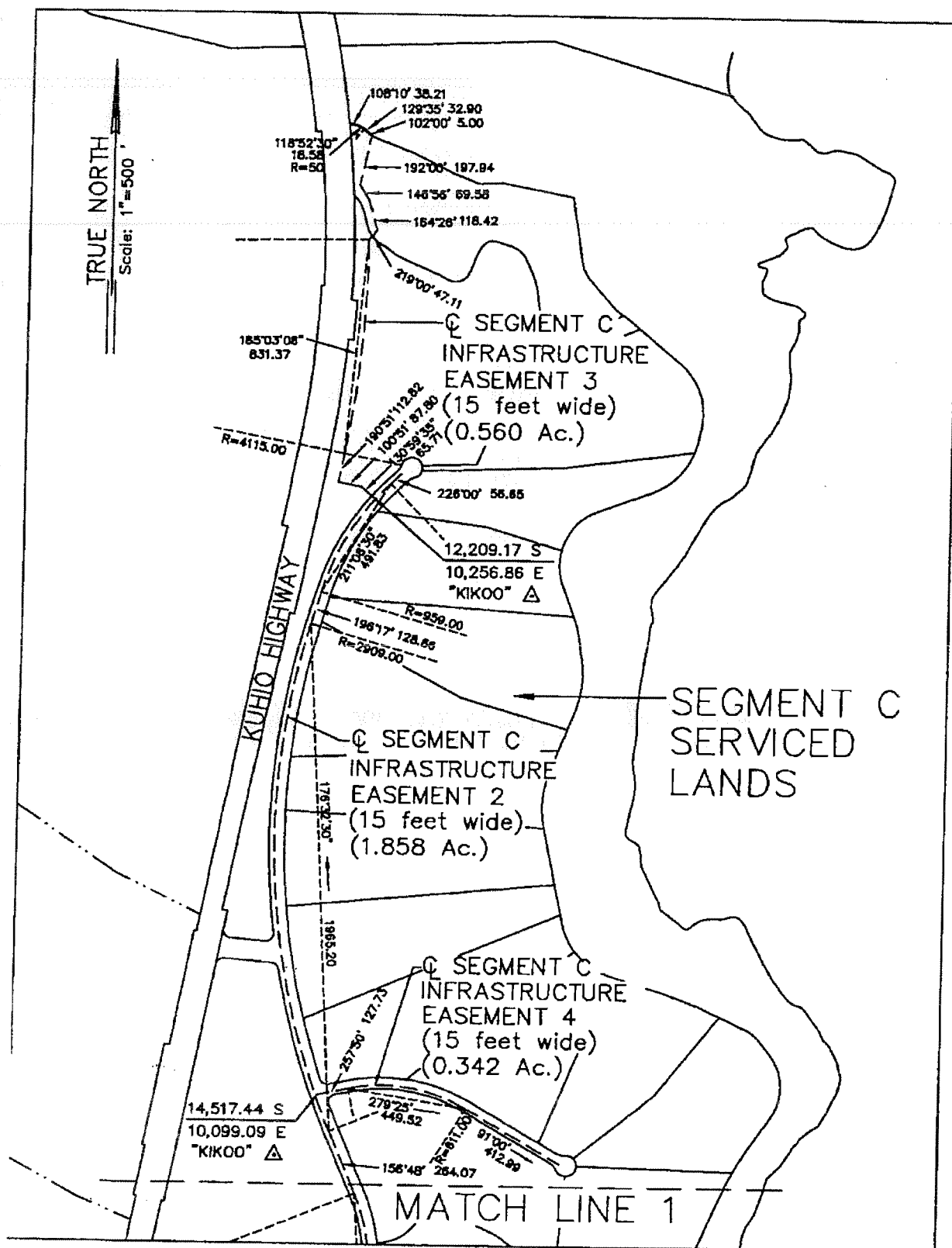
SEGMENT C INFRASTRUCTURE EASEMENTS  
SEGMENT C SERVISED LANDS

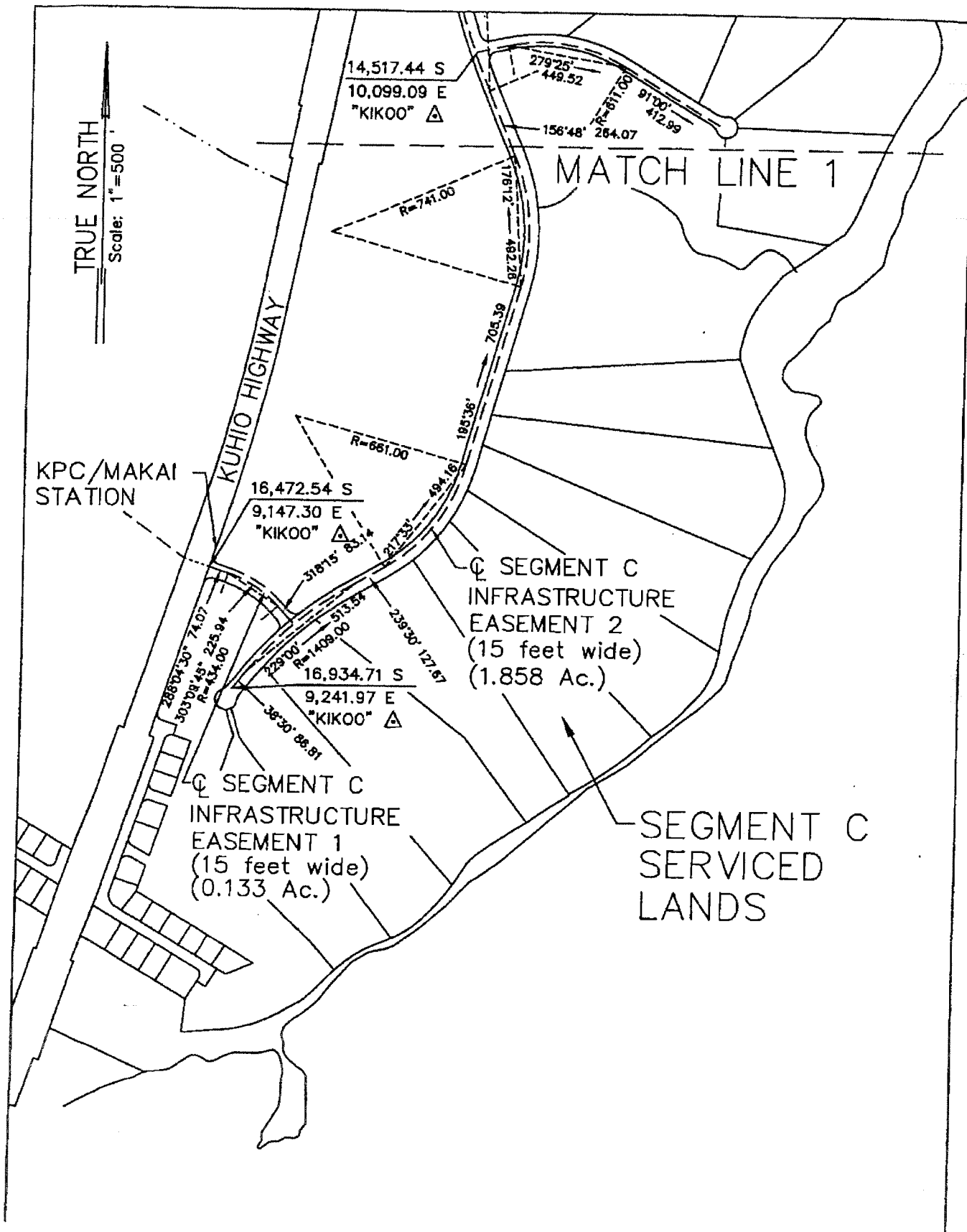












**EXHIBIT D**  
**TO WATER SERVICE AGREEMENT**

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**DESCRIPTION OF SEGMENT C SERVICED LANDS/Kealia Kai Subdivision**