

**DRAFT ENVIRONMENTAL
ASSESSMENT**

FOR

**REPLACEMENT OF AN ON SITE WASTEWATER
TREATMENT PLANT**

**MAKAHUENA AOA
1661 PE'E ROAD, PO'IPU, KAUA'I
[TMK: 2-8-20:3]**

**Prepared for
County of Kaua'i Department of Planning**

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May 2010

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I. INTRODUCTION: PROJECT SUMMARY

Project Name: Makahuena On Site Wastewater Treatment Plant

Owner/Applicant: Association of Apartment Owners of the Makahuena at Po‘ipu

Approving Agency: Kaua‘i County Planning Department

Project Location: 1661 Pe‘e Road
Po‘ipu, Kaua‘i
TMK: 2-8-20:3

State Land Use Classification: Multi-Family Residential

Anticipated Determination of

Environmental Assessment: A Finding of No Significant Impact (FONSI) is expected for this project.

Agencies and parties

Consulted during Draft EA

Preparation included: State Department of Health, Office of Environmental Quality Control
Kaua`i County Planning Department

II. SUMMARY OF PROPOSED ACTION

The Association of Apartment Owners (AOAO) of the Makahuena at Po‘ipu propose to construct a new on site wastewater treatment plant (WWTP) within the footprint of the existing irrigation storage tank. The purpose of the project is to replace the existing on site WWTP and ancillary equipment which is over 30 years old and is reaching the end of its anticipated service life.

The proposed project will require approval associated with the Special Management Area (SMA) and Shoreline Setback Determination (SSD) boundaries as defined by the County of Kauai. The proposed project is located further upslope and inland from the shoreline and includes the replacement and improvements to the existing on site wastewater treatment plant. The proposed project will be constructed within the existing multi-family residential property. Any new structures and/or proposed activities located within the SMA boundary area require approval by the County of Kauai Planning Department and a Shoreline Setback Determination (SSD) is also required indicating that the setback area is properly located.

This Draft EA (DEA) was prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS), Chapter 200 Title 11, Administrative Rules, State of Hawaii Department of Health. The proposed project includes the creation of a wastewater treatment facility servicing over 50 units and, therefore, requires the preparation of an EA pursuant to Chapter 343-5(9), HRS and associated Title 11, Chapter 200, HAR. This DEA provides a framework to address the potential impacts of the proposed project on the designated SMA boundary.

This DEA evaluates the environmental issues involved with the project and assures the responsibility of its accuracy and content. The information within this DEA has been used to determine whether or not the impacts of the proposed action are significant enough to warrant the preparation of an Environmental Impact Statement (EIS). This DEA evaluates the existing environmental conditions and potential environmental impacts resulting from the

proposed project, as well as the mitigation measures which would be implemented to minimize any adverse impacts.

A. Project Purpose and Need

The Makahuena AOA proposes to improve the wastewater facilities to address existing deficiencies and insure that proper wastewater treatment is maintained and in accordance with State Department of Health (DOH) requirements prior to discharging the effluent into the approved DOH on-site injection wells.

B. Alternative Analysis

Several wastewater treatment processes were evaluated for the replacement of the existing WWTP at Makahuena. The replacement options evaluated included; 1) Sequencing Batch Reactor (SBR); 2) Extended Aeration, and 3) Membrane Bio-Reactor (MBR). Each system evaluated was designed to produce effluent with concentrations of Biological Oxygen Demand (BOD) and Suspended Solids (SS) below 60 mg/l, which is the maximum allowed by the State DOH for these parameters. Effluent concentrations of 20 mg/l for both BOD and SS are typical for SBR and Extended Aeration Plants. Effluent concentrations of 5 mg/l for BOD and SS are typical for MBR plants. A brief description of the three processes evaluated are presented as follows:

I. Extended Aeration

Extended aeration systems are activated sludge systems that are optimized to operate with low flow rates and relatively long aeration periods. The existing wastewater treatment plant at Makahuena is an extended aeration plant. The basic components of the system are the aeration tank, air compressor(s) which provide both the required oxygen source and the energy for mixing the contents in the aeration tank, and the clarifier(s) to separate the biomass from the treated effluent. The settled biomass is recycled back to the aeration tank. The advantages of an extended aeration system are:

- Ease of operation.

Some of the disadvantages of an extended aeration system are:

- High energy costs associated with operation of compressors.
- Energy use is near constant with varying influent flow rates.

II. Sequencing Batch Reactor (SBR)

The SBR system is essentially an activated sludge system where aeration and clarification are carried out in a single tank or batch reactor. Each cycle consists of five basic steps: idle, fill, aeration, settling and decant. During the treatment cycle, new incoming flow is either held in an equalization tank or directed to a parallel reactor. Variations in incoming wastewater flow rates are handled by varying the length of the idle phase. The reactor tank is sized to handle peak flows. During periods of average or low flow rates, fewer cycles per day will be required. The advantages of the SBR system are:

- Equalization, biological treatment and clarification can be achieved in a single basin
- Small Footprint
- Capital cost savings by eliminating clarifiers
- Number of treatment cycles per day is directly related to the daily flow. During periods of lower than average flow, energy use for aeration will be proportionally lower.
- Operation is automated by a small computer

Disadvantage of an SBR system include:

- Higher level of maintenance compared to a conventional extended aeration system due to more sophisticated controls and automatic devices

III. Membrane Bio-Reactor (MBR)

The MBR is essentially an activated sludge system with the final clarifiers being replaced with microfiltration membranes. Semi-permeable membranes are placed directly in the aeration tank and effluent (permeate) is drawn through the membrane. Effluent quality is high due to the small size of the pores in the membrane. Effluent BOD and SS concentrations of 5 mg/l and less are common with MBR systems. Advantages of an MBR system are:

- Very high effluent quality.
- After disinfection, effluent is typically suitable for reuse applications
- Small Footprint due to elimination of the clarifier

Some of the disadvantages of an MBR system are:

- High capital cost

- High energy cost (approximately twice the energy requirement of an extended aeration system)
- Energy use is near constant with varying influent flow rates.
- Higher level of maintenance compared to either the conventional extended aeration system or the SBR due to more sophisticated controls and automatic devices, and cleaning of the membranes
- Membranes will likely need to be replaced during the typical 20 year life cycle of the wastewater treatment system

LOCATION OPTIONS

Three alternative locations for the replacement WWTP were evaluated. All alternative locations required that the existing treatment plant be kept in service during the construction and replacement of the new system.

The locations evaluated included:

- Locate the new plant in the lawn area near the existing treatment system.
- Locate the new plant in the parking lot in the area of the existing underground irrigation tank.
- Locate the new plant aboveground in the parking area to the north (mauka) of the tennis court.

The major advantages and disadvantages to each of these locations are summarized below.

Option	Advantages	Disadvantages
Buried at lawn near existing treatment system	<ul style="list-style-type: none"> • Structures do not have to be traffic rated. • Keeps treatment system in same general location as existing system • Replacement system should be quieter than the existing system • Less disruption to parking area during construction. 	<ul style="list-style-type: none"> • Construction will be disruptive to residents and guests when they are using the pool area. • Access to construction area is difficult. Concrete would have to be pumped from parking area. • More expensive than aboveground installation • Underground design may make operation inconvenient
Buried at parking lot at existing irrigation tank	<ul style="list-style-type: none"> • Main treatment to be removed from lawn area near pool. • No permanent loss of parking spaces after construction is complete. • Less visible to residents and guests. • Less potential for noise disturbances 	<ul style="list-style-type: none"> • More expensive than aboveground installation • Underground design may make operation inconvenient.
Aboveground north of tennis court	<ul style="list-style-type: none"> • Less capital costs • Less disruption during construction • Easier access for plant operations. • May be able to defer backfilling of existing irrigation tank under parking lot 	<ul style="list-style-type: none"> • Aesthetics – Treatment plant will be visible to residents and guest as they arrive. • Visible from the tennis court. • Permanent loss of 4 or 5 parking stalls.

SELECTED TREATMENT PROCESS

Each of the three (3) treatment processes were evaluated based on the five (5) factors which included; Treatment Performance, Capital Costs Energy, Annual Energy and Operation and Maintenance Costs, Ease of operation, and Flexibility in locating on site.

Based on the evaluation of the three (3) treatments processes and the available location alternatives it was recommended that the existing WWTP at Makahuena be replaced with an SBR system. In summary the SBR provides a greater potential to save on annual energy costs, lower initial capital investment and a smaller footprint was required.

The alternative chosen includes the replacement of the existing extended aeration wastewater treatment plant with a new Sequencing Batch Reactor (SBR) plant to be located underground in the parking lot area adjacent to the tennis court. The top slab of the treatment tanks will be traffic rated. Traffic rated access hatches will be provided where necessary for operation and maintenance.

C. Proposed Project Description

The existing treatment plant is a packaged extended aeration plant that was built during the original project construction in 1979. It is located underground in the lawn area adjacent to the pool. The treatment plant components include a pre-loader that intercepts grease from the influent, an aeration tank, two clarifiers and an effluent pump station. There are two 10 hp blowers located in a partially underground vault that provide compressed air for the aeration tank. The condition of the existing treatment tank is poor and due to the structural failure of the underground sludge storage tank, the sludge tank has been taken out of service and filled in. Waste sludge is currently being stored in the aeration tank. The waste sludge is removed approximately every 3 months. Currently the effluent is collected in a submersible pump station, and pumped to an existing primary injection well located in the parking area near the tennis court. A back up, secondary injection well is located adjacent to the existing WWTP. In the event of a power outage, the complex has an emergency generator available to run the aeration blowers and the effluent pumps. The facility currently has a Notice of General Permit Coverage (NGPC) for the treatment works for the existing (HI05WWGP421) wastewater treatment plant. Figure 1 illustrates the existing WWTP.

The proposed project improvements include installing a new wastewater treatment plant tank 60' x 15' within the same location as that of the existing underground irrigation tank. This irrigation tank will be removed prior to the construction of the new wastewater treatment plant tank. Upon completion, the new tank will be totally underground with its roof slab serving as part of a renovated parking lot.

The project will also involve demolition of existing concrete sidewalks and/or temporary relocation of existing landscape plants and grass within a 5 foot width for the required installation of new sewer piping and electrical ducts, approximately 700 feet in total length. The existing effluent pump station will be retrofitted to serve as a new influent pump station and miscellaneous sidewalk and rock wall improvements are also planned. New concrete sidewalks and relocation of landscape plants and grass back to existing conditions will cover all underground pipe and electrical duct installations. Figure 2 illustrates the new WWTP and improvements.

All site final grades and surface drainage flows will be returned to pre-construction conditions. Upon successful start-up and testing of the new wastewater treatment plant system, the existing wastewater treatment system will be taken off line, pumped, cleaned and secured. The structures will be partially demolished and backfilled with suitable backfill materials later in a following phase of construction.

D. Schedule

The anticipated start date for this project is August 1, 2010 and once initiated all phases of the project will be completed by November 30, 2010. Private funds will be used exclusively to pay for the cost of this proposed project.

III. SUMMARY DESCRIPTION FOR THE AFFECTED ENVIRONMENT

The Makahuena at Po‘ipu is located on Kaua‘i’s south shore. There are 78 single family apartment units including one single family residential unit that exist on the property. The area includes asphalt pavement driveways and parking areas providing parking for resident and visitor vehicles (Figure 3A and 3B).

A. Topography

The elevation of the property ranges from approximately 10 to 75 feet above mean sea level. The land elevation of the proposed new on site wastewater treatment plant tank is estimated to be approximately 57 feet above mean sea level. The shoreline area of the property and surrounding properties to the east and west of the site consists of rock ledges and formations. The landscaping on site consists of large grass areas with various trees and plants fronting the residential units.

The proposed project would involve some site clearing, grubbing, and grading work at the site. The topography of the site will not be significantly impacted within the footprint of the proposed project area. Due to the already flat topography of the project site, changes in topography are expected to be relatively insignificant.

B. Flora and Fauna

The Makahuena at Po‘ipu is a multi-family residential unit/resort that was constructed in 1979. The project area has been significantly altered through previous development activities, including clearing and grading. During the initial phase of construction, the entire property was cleared and grubbed of all existing structures and vegetation. After building construction and miscellaneous site improvements were completed, the landscaping work commenced with the installation of grass in the large open areas with hibiscus hedges, plumeria-palm-coconut trees and tropical plants & shrubs added along walkways and buildings to provide an island style ambiance. The landscaping is irrigated with an underground sprinkler system and maintained by full time resort staff.

The predominant fauna inhabiting the area included the introduced Hawaiian rat, house mice, brown rat, black rat and feral cats and dogs. Avifauna that may be found in the area include mynas, sparrows, finches, doves and cardinals.

There are no threatened, rare or endangered animal species are known to occur within the proposed project area.

During construction of the proposed project, the irrigation system will remain in service at all times except for temporary shut-downs and reconnections due to new irrigation installation work. Grass and plants that conflict with the installation of new work will be temporarily removed in sections and replanted upon completion of each section of new work. Landscape maintenance will be permitted in all areas except those areas in the zone of construction.

No direct impacts on the flora and fauna resources are anticipated as a result of construction of the proposed project, as the development of the new on site WWTP would be consistent with the current operations at the site. There are no identified or known threatened, rare, or endangered species of flora or fauna inhabiting the project site. Flora and fauna have previously been displaced due to past construction and operation activities at the project site. Noise produced by the construction of the proposed project may temporarily displace some of the birds and rodents found at the plant. These animals will most likely re-establish themselves on the property once construction is complete. Anticipated adverse impacts to flora and fauna are not expected. No sensitive habitat areas have been identified within the project site.

C. Archeological and Historic Resources

The project site has a history of past development. It is assumed that any site features of historic or archaeological value have been recovered or displaced during these periods of development. Presently, no archaeological or historical resources are known to exist at the proposed project site. Under the proposed project, no impacts on historic, archaeological, or cultural resources are anticipated for none were identified within the project area. Excavation and earthmoving is anticipated to take place in areas that were previously disturbed. It is not

currently known what cultural impact or archaeological assessments were previously performed on the property. A “Letter of Determination Request” was submitted to the State Historic Preservation Division regarding the project area.

D. Water Resources

I. Groundwater

Water resources within the Hawaiian Islands include three main types of aquifer systems: (1) basal lens; (2) dike water; and (3) perched. The basal lens consists of fresh coastal groundwater that floats on the denser underlying salt water. Dike water systems are generally located at high elevations and comprise groundwater that is impounded between impermeable basaltic dikes. Perched groundwater systems are formed as isolated lenses of groundwater resting on a geologic layer such as clay.

Groundwater at the site is within a basal groundwater area that is brackish. Consequently, no deep water wells have been drilled at the site and there are no potable water wells at the project site.¹ Depth to groundwater at the Property is estimated to be 50 to 70 feet below ground surface, based on the site elevation above sea level. The direction of groundwater flow beneath the Property is not definitively known. In the Hawaiian Islands, groundwater is generally assumed to flow down gradient and toward the ocean. The State DOH-established Underground Injection Control (UIC) program was established to protect the quality of underground sources of drinking water from pollution by subsurface disposal of fluids.² The UIC line is the boundary between non-drinking water aquifers (generally *makai*, or seaward, of the UIC line) and underground sources of drinking water (generally *mauka*, or toward the mountains, of the UIC line). The Property is located *makai* of the State DOH-established UIC line.³

The construction and operation of the proposed project would not have an impact on the drinking water resources. No significant impact to the groundwater underlying the project site is anticipated during the construction or operation of the proposed project. Mitigation measures will be developed to protect the groundwater resources during construction.

¹ State of Hawai'i, University of Hawai'i at Hilo, Department of Geography. 1998. Edited by Sonia P., and James O. Juvik. *Atlas of Hawai'i, Third Edition*.

² Hawai'i Administrative Rules, Title 11, Chapter 23. September 22, 1992.

³ State of Hawai'i Underground Injection Control Map. Island of Kauai, Effective July 6, 1984.

II. Surface and Coastal Water

Surface Water

Surface waters associated with the project area include the Pacific Ocean between Poipu Beach and Makahuena Point. As classified and regulated by the State of Hawai‘i, Department of Health (DOH) under *Title 11 Hawaii Administrative Rules, Chapter 54 Water Quality Standards*, the inner portions of area are designated as Class AA marine waters.⁴ The management objective of Class AA waters is to retain the waters in their natural pristine state as much as possible with an absolute minimum of pollution or alteration of water from any human-caused source or actions.

Coastal Zone Management

Chapter 205A, HRS, the Hawaii Coastal Zone Management (CZM) Program was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. The CZM area encompasses the entire state including all marine waters seaward to the extent of the state’s police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. All proposed project is consistent with the Hawaii Coastal Zone Management Program objectives in the following areas:

- **Recreational Resources:** *Provide coastal recreational opportunities accessible to the public.*

Access to these recreational facilities will not be impacted by any of the proposed project schemes.

- **Historic Resources:** *Protect, preserve, and, where desirable, restore those natural and manmade historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*

There is no known Registered Places of Historic importance located within the proposed project site.

⁴ DOH. 1987. Island of O‘ahu Water Quality Standards Maps.

The nature of the proposed facility improvements may pose potential short-term impacts to erosion, sedimentation and local water quality, primarily related to storm water runoff from the near cliff-side during the construction phase of the project. The potential water quality impact to the cliff-side waters during construction is considered remote and will be mitigated to adhere to the State of Hawaii and County of Kauai water quality regulations. All land disturbing activities (i.e. grading, excavation, etc.) are expected to be accomplished only to the extent necessary to facilitate the construction of the proposed project and its supporting infrastructure.

Certain aspects of the proposed project require the preparation of an erosion and control plan for approval by the County of Kauai before commencing excavating activities. An erosion and control plan is designed to minimize erosion and sedimentation, and consider all factors that contribute to erosion and sedimentation. Figure 4 presents the Erosion Control Plan for the proposed project. Below are a few examples that may be included in an erosion and control plan:

- Temporary silt fences: for use during the earthmoving activities.
- Permanent control measures: and facilities, including disposal of materials removed from the project area.
- Collection of Runoff: All runoff from the project area will be collected and diverted to facilities for removal of sediment. Keep run-off on site
- Pollution Prevention: Prevent cement products, oil, fuel and other toxic substances from entering any bodies of water.
- Watering: The project site will be watered daily to help minimize any dust.

With the proposed project, the above listed measures for erosion and sedimentation control will be implemented in order to comply with all local regulations. To further minimize the effects resulting from grading and construction activities, applicable Federal, State and County rules and regulations will be implemented. All appropriate and applicable best

management practices will be implemented to help reduce and control discharge of runoff from the construction areas.

E. Flood Hazards

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) shows the project area to be in Zone X, which is described as the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. Majority of the project site is located in Zone X, with portions of the property along the coastline located in Zone AE (elevation 24) (FIRM Community Panel No. 150002 0352E). Zone AE which is defined as an “Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods.

Construction activities and improvements at the project site will conform to all applicable governmental standards. The proposed project will not have a significant impact or contribute to flood hazards on or around the property.

F. Noise

The ambient noise of the property is dominated by the sounds of wind rustling vegetation, and water movement against the shore. The prevailing trade winds and the close proximity of the project site to the ocean, combine to provide a buffer from elevated noise.

Construction-related activities would generate noises that are likely to be audible in neighboring areas, but would not be at levels that would be detrimental. The loudest potential construction equipment noise sources may include pavers (88 dBA at 50 feet [15.2 m]), pneumatic tools (88 dBA at 50 feet [15.2 m]), and trucks (93 dBA at 50 feet [15.2 m]). Noise levels decrease significantly with increasing distance from the source; a 6 dB decrease is generally exhibited with each doubling of the distance between the source and the location at which noise is audible.⁵ Therefore, noise from trucks would be less than 65 dBA at a distance of 1,600 feet (488 m). Potential noise impacts would be minimized by restricting construction work to daylight hours and installing noise mitigation on the equipment.

⁵ For example, if an activity generates 93 dBA at a distance of 50 feet (15 meters), the noise level at a distance of 100 feet (30 meters) would decrease to 87 dBA, and would further decrease to 81 dBA at a distance of 200 feet (61 meters).

The proposed project will have little or no long term impacts on the ambient noise levels in the area. Ambient noise levels may be affected at a minimal level during the construction of the proposed project. All vehicles and equipment used during construction will be properly muffled and maintained to reduce noise impacts associated with the construction activities.

Once operational, the noise generated from the project area would be consistent and in accordance with the designated land use. Operation of the proposed project would not result in a permanent (on-going) increase in ambient noise levels, and would not exceed the State of Hawai'i noise level zone standards of 65 dBA⁶ during the daytime.

G. Air Quality

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures.⁷ The Hawaiian Islands experience two seasons: "summer" (May to October) and "winter" (November to April). Summer is characterized by overhead sun, heat, and mild trade winds, while winter has higher rainfall, cooler temperatures, and stronger trade winds. The predominant wind direction at the site is from the east-northeast and the mean annual rainfall is approximately 34 inches.

The state of Hawai'i is in "attainment" of the NAAQS. Air pollutant emissions at the proposed project site are primarily attributed to mobile sources (e.g., vehicles) and stationary sources (e.g., landscaping equipment) related to resort operations.

No significant impacts to air quality would be associated with the proposed project. Construction-related impacts would be short-term and temporary. Emissions would possibly result from generators, construction related vehicles, and fugitive dust. Fugitive dust would be minimized as required by HAR 11-60.1-33 and generators would operate as allowed under HAR 11-60.1.

No significant long-term impacts to air quality are expected as a result of the development of the proposed project. Emissions from the activities associated with the project site would

⁶ State of Hawaii Noise Standards, Department of Health.

⁷ State of Hawai'i, University of Hawai'i at Hilo, Department of Geography. 1998. Edited by Sonia P., and James O. Juvik. *Atlas of Hawai'i, Third Edition*.

continue at approximately the current levels, and would comply with HAR 11-60.1, and would not significantly impact the air quality.

H. Special Management Area

The purpose of the Special Management Area (SMA) Assessment is to regulate any use, activity or operation that qualifies as a “Development.” The assessment provides a means to preserve, protect and where possible, restore the natural resources of the Coastal Zone by establishing special controls on development within the areas along the shoreline so as to avoid the permanent loss of valuable resources and the foreclosure of land use and management options. The SMA originally encompassed all lands extending not less than 100 yards inland from the shoreline. The shoreline is defined as the upper reaches of the wash of the waves (other than storm or seismic waves) at high tide during the season of the year in which the highest wash of the waves occurs. The shoreline is usually evidenced by vegetation growth, or the upper limit of debris left by the wash of waves.

SMA applications are reviewed by the County of Kauai Planning Commission for completeness and approval. The following considerations are specified in Chapter 205A, Hawaii Revised Statutes (HRS) regarding the use of the land within the Special Management Area. These concern will be addressed as relevant to the Proposed Project:

1. All development in the Special Management Area shall be subject to reasonable terms and conditions set by the planning commission to ensure that:

(a) Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles.

Access to publicly owned or utilized beaches, recreation area and natural reserves will remain the same as a result of the proposed project.

(b) Adequate and properly located public recreation areas and wildlife preserves are reserved.

There are no wildlife preserves on or near the property. There is no impact anticipated to the recreation areas from the proposed project.

(c) Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon Special Management Area resources.

Solid waste at the project site is collected by the County of Kauai Department of Public Works or private haulers and transported to the County Landfill. Any solid waste generated by during the construction will be disposed of properly and will not impact the region's solid waste refuse collection. Presently the wastewater at the facility is serviced by an existing WWTP. The proposed project includes the replacement of the existing WWTP in order to maintain proper treatment of the wastewater. The proposed project will not impact the solid and liquid waste treatment resources in the region.

(d) Alterations to existing landforms and vegetation; except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquakes.

The proposed project is on previously disturbed and developed land. No coastal scenic or recreational amenities will be affected. With respect to flood hazard, the project falls within Flood Zones X and AE. The proposed facility is approximately 300 feet from the coastline and lies outside the tsunami inundation zone. The facility is assigned to a Seismic Design Category B, moderate seismic hazard, and is designed to meet the requirements of the IBC 2006 Standards.

2. No development shall be approved unless the planning commission has first found that:

(a) The development: will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential, cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect: and the elimination of planning options.

The proposed project involves the replacement of the existing WWTP that has reached the end of its useful service. Not replacing the WWTP could possibly create and adverse environmental effect. The replacement of the WWTP will create a beneficial positive effect; in that it will ensure that the wastewater is properly treated, therefore not creating an adverse effect to the environment.

(b) The development: is consistent with the objectives and policies set forth in the Special Management Area Rules and Regulations of the County of Kauai, as amended (July 1998) and any guidelines contained in HRS Section 205A-26.

These objectives and policies are discussed in the coastal zone management Section D.II.

(c) The development is consistent with the county general plan, development plans and zoning.

The land use designation for the subject property indicates that the area is to be used for multi-family residential purposes. The project conforms to the county general plan, development plans and zoning. The proposed project will provide the facility with the improved wastewater treatment, which are necessary and vital to both the welfare and public safety of the community.

3 .The Planning Commission shall seek to minimize, where reasonable:

(a) Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon.

The proposed project is self-contained within the existing property boundary. No ocean or fresh water resources will be affected by the proposed project. The proposed project does not involve dredging, filling or other alterations to any bay, estuary, salt marsh, river mouth or lagoon. The proposed project will not have a significant impact on the coastal shoreline located approximately 300 feet from the proposed project site.

(b) Any development, which would reduce the size of any beach or other area usable for public recreation.

There is no impact anticipated to the recreation areas from the proposed project.

(c) Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions or rivers and streams within the Special Management Area and the mean high tide line where there is no beach.

The proposed project will have no effect public access to tidal or submerged lands, beaches, rivers or streams.

(d) Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast.

The state highway nearest the coast is Highway 520, which is approximately one mile from the project site. The project will not substantially detract from the line of site toward the sea from this coastal highway.

(e) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

The proposed project is not anticipated to have an impact on water quality or existing areas of open water. With the proposed action, measures for erosion and sedimentation control will be implemented in order to comply with all local regulations. To further minimize the effects resulting from grading and construction activities, applicable Federal, State and County rules and regulations will be implemented. All appropriate and applicable best management practices will be implemented to help reduce and control discharge of runoff from the construction areas. The operations of the proposed project will not adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

The proposed project is not anticipated to have an impact on the SMA boundary area. A determination that the proposed project is consistent with the county's community plan objectives and zoning policies will be completed by the submittal of a completed SMA Assessment Application. The County of Kaua'i Planning Commission will review the SMA Assessment Application to determine whether the proposed action qualifies as a "Development" and will make a determination on whether the proposed action is: (1) Exempt, (2) requires a SMA Minor Permit, (3) requires a SMA Major Permit, (4) requires a SMA Emergency Permit, or (5) cannot be processed due to inconsistencies with the county general plan, community plan, and zoning.

I. Shoreline Setback

The United States Congress enacted the federal Coastal Zone Management Act in 1972. To comply with the Act, the Hawaii State Legislature passed Public Law 92-583: “The Hawaii Coastal Zone Management Act of 1977” (Hawaii Revised Statutes Chapter 205A or HRS 205A). Like the federal Act, the State law contains a number of wide ranging objectives and policies. These are intended to guide the conservation and development of land and water resources within the coastal zone in light of competing demands for limited and sensitive coastal resources. Shoreline Setback regulations are governed by Chapter 205A of HRS, as amended and Chapter 8, Article 27 of the Kaua‘i County Code 1987, as amended. The purpose of these rules are to regulate the use and activities of the land within the shoreline environment in order to protect the health, safety, and welfare of the public by providing minimum protection from know coastal hazards; and to ensure that the public use and enjoyment of our shoreline resources are preserved and management law, HRS Chapter 205A, as amended. Shoreline Setback Areas are a subset of the Special Management Area and range from 25 feet over 200 feet from the shoreline. Significant restrictions apply to the types of activities, structures and/or developments that are permitted within the Shoreline Setback Areas.

Establishment of the shoreline setback line is defined by Chapter 8, Article 27 of the Kaua‘i County Code 1987, as amended, as:

“For lots with an average depth of one hundred sixty (160) feet or less, the shoreline setback line shall be established based on the average depth of the lot as provided in Table 1 (§8-27.3), or at the option of the applicant, upon a coastal erosion study as provided in Table 2 (§8-27.3).

The site location has a minimum lot depth of 80 feet and a maximum of 520 feet. The average depth is in excess of 200 feet. The proposed project improvements are located approximately 60 feet (new piping placement) to over 300 feet (replacement of the WWTP tank) from the shoreline area. Any new structures and/or proposed activities must receive a Shoreline Setback Approval issued by the County of Kaua‘i Planning Commission and a Shoreline Setback Determination (SSD) indicating that the setback area is properly located.

IV. SUMMARY OF IMPACTS AND MITIGATION MEASURES

A. Impacts

The project area contains development similar to the proposed project in scope. The anticipated short-term impacts associated with the implementation and construction of existing improvements to the WWTP facilities are confined to the immediate site and to the area's existing infrastructure. Short-term impacts of the proposed action, which may affect the project site and adjacent areas, are generally associated with the construction activities such as clearing and grading, excavating, and landscaping. The short-term impacts shall be limited to the estimated construction period and all construction activities will be contained within the project site property. Construction, operation, and maintenance of the proposed project (replacements and improvements to associated WWTP infrastructure), as outlined, could have short-term minimal adverse impacts as well as long-term positive impacts on the public health, safety and human environment. Most of the adverse impacts would be short-term and construction-related. The proposed projected related impacts are expected to be minimal or negligible with implementation of appropriate mitigation measures.

For the proposed project, impacts on human environment are expected to not be significant with implementation of prescribed adverse affect minimization/mitigation measures outlined in this EA, along with the application of regulatory compliance. The most positive impact of the project will be the long term treatment of influent waste flows from the property. The existing treatment plant is reaching its anticipated service life and sewage spills or plant shutdowns are an ever increasing possibility. Relocating the wastewater treatment tank further inland from the shoreline and upslope provides increased survivability in the case of a strong hurricane or tsunami. Beneficial impacts to the water quality and public safety resulting from improving the wastewater treatment outweigh the short-term, minimal adverse impacts associated with construction.

The anticipated long-term impacts associated with the operation of the proposed action and support structures are confined to the immediate site and to the area's existing infrastructure.

B. Summary of Mitigation Measures

No specific major negative impacts have been identified. Discussed as follows are potential impacts of limited scope to the project area.

The Contractor will be required to minimize potential impacts through the implementation of mitigation measures. In order to prevent potential dust problems created by the construction operations, it is recommended that site watering, covering of stockpiles & materials or installing dust fencing be implemented. Construction activities will be limited to work between the hours of 8 A.M. and 5 P.M. The Contractor will be required to install sound reducing devices on equipment mufflers if noise decibels exceed accepted levels. The Contractor will be required to install erosion control measures such as silt fencing and storm drain protective devices during the construction period. The Contractor shall prevent storm water from the open construction area to directly enter the ocean. The Contractor shall provide barricades and safety fencing to prevent pedestrians, animals and vehicles from entering the construction area. Open excavations shall be fenced off or covered when the Contractor has left the site.

VI. FINDINGS AND REASONS SUPPORTING THE DETERMINATION

The applicant, Makahuena AOA has applied the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and the necessary significance criteria of Section 11-200-12 of Title 11 Chapter 200 and has determined that the proposed project will not have significant **adverse impacts on the immediate or surrounding environment including air quality, water quality, noise, wildlife habitats, archaeological sites, or existing utilities**. Any anticipated impacts will be encountered during the construction phase and will only be temporary and will not adversely impact the immediate and surrounding area. Discussion of the project conformance to the significant criteria is as follows:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The purpose of this project is to replace an aging wastewater treatment plant with a new wastewater treatment plant. This project will be located in a previously improved area and will not cause a loss or destruction of any natural or cultural resource.

2. Curtails the range of beneficial uses of the environment.

This project will be constructed primarily underground and will not impact the range of beneficial uses of the environment.

3. Conflicts with the state's long-term environmental polices or goals and guidelines as expressed in Chapter 344, HRS, and any revision thereof and amendments thereto, court decisions, or executive orders.

This project is consistent with Chapter 344 in that the aim is to preserve the natural resources "by safeguarding the State's unique natural environmental characteristics". Therefore, the installation of the new wastewater treatment plant will, in effect, reduce the risk of sewage spills and is in line with the state's long-term environmental policies.

4. Substantially affects the economic, social welfare and cultural practices of the community or state.

The project will not impact either the economic or social welfare or the cultural practices of the community or state due to being located on private property that has been previously improved.

5. Substantially affects public health.

The project will not affect public health. Potential positive impacts to public health are: improved wastewater treatment and reduced risk of sewage spills.

6. Involves a substantial secondary impacts, such as population changes or effects on public facilities.

The fact that the project is being done on private land, rules out any impact on population or public facilities.

7. Involves a substantial degradation of environmental quality.

The purpose of this project is to improve the quality and reliability of wastewater treatment prior to pumping the effluent into the injection well.

8. Is individually limited but has considerable effect upon environment or involves a commitment for larger actions.

This project replaces an aging wastewater treatment plant with a new wastewater treatment plant. It will not detrimentally effect the environment or involve a commitment for larger actions.

9. Substantially affects a rare, threatened, or endangered species or its habitat.

The fact that the project is being done on private land that had been previously improved, rules out any impact on rare, threatened, or endangered species or its habitat.

10. Detrimently affect air or water quality or ambient noise levels.

All possible anticipated short term impacts to air quality, water quality or noise levels most likely due to occur during the construction phase will be mitigated through the appropriate measures and Best Management Practices (BMPs) presented in this EA document. The ambient noise levels are expected to remain unchanged.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, and estuary, freshwater, or coastal waters.

The project is located adjacent to existing coastal water. It is, however located further inland and higher in elevation than the previous existing wastewater plant. The proposed project will be constructed within the existing facility footprint, which is not located in an environmentally sensitive area.

12. Substantially affect scenic vistas and view planes in county or state plans or studies.

This project will be constructed primarily underground and will not affect scenic vistas and view planes in county or state plans or studies.

13. Requires substantial energy consumption.

The proposed project will result in the short-term commitment of fuel for equipment, vehicles and other machinery utilized during construction. The short-term energy demand is not considered excessive and the proposed project is not anticipated to create long term additional demands for energy consumption. When the new wastewater treatment plant is fully operational, the fuel consumption will be equal to the existing wastewater treatment plant.

VII. PERMITS REQUIRED

In addition to the approval of this Environmental Assessment, the following permits and approvals are required for the development of the proposed project.

STATE OF HAWAII

- Permit for Design & Construction of a Wastewater Treatment Facility - Hawaii
Department of Health, Wastewater Branch.

COUNTY OF KAUAI

- Construction Plan Review and Approval - Department of Planning
- Building Permit - Department of Planning
- Special Management Area Use Permit (Major) - Department of Planning
- Shoreline Setback Determination - Department of Planning
- Grading, Grubbing and Stockpiling Permit - Department of Public Works

VIII. EA PREPARATION

The following agencies have been and will be consulted in the review of the Draft Environmental Assessment for the Makahuena On Site Wastewater Treatment Plant at Po`ipu. All of the comments that are received will be addressed in the appropriate sections of the Final Environmental Assessment.

STATE AGENCIES

Office of Environmental Quality Control
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96814

Hawaii State Library
Hawaii Documents Center
478 South King St.
Honolulu, Hawaii 96813

Kauai County Library
4344 Hardy Street
Lihue, Hawaii 96766

COUNTY OF KAUAI AGENCIES

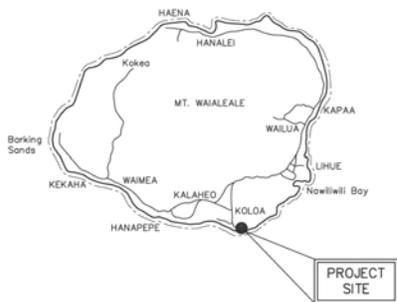
Department of Planning
4444 Rice Street
Lihue, Hawaii 96766

INDIVIDUALS/ORGANIZATIONS

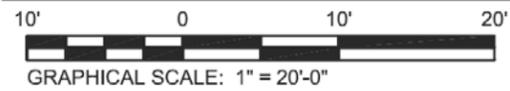
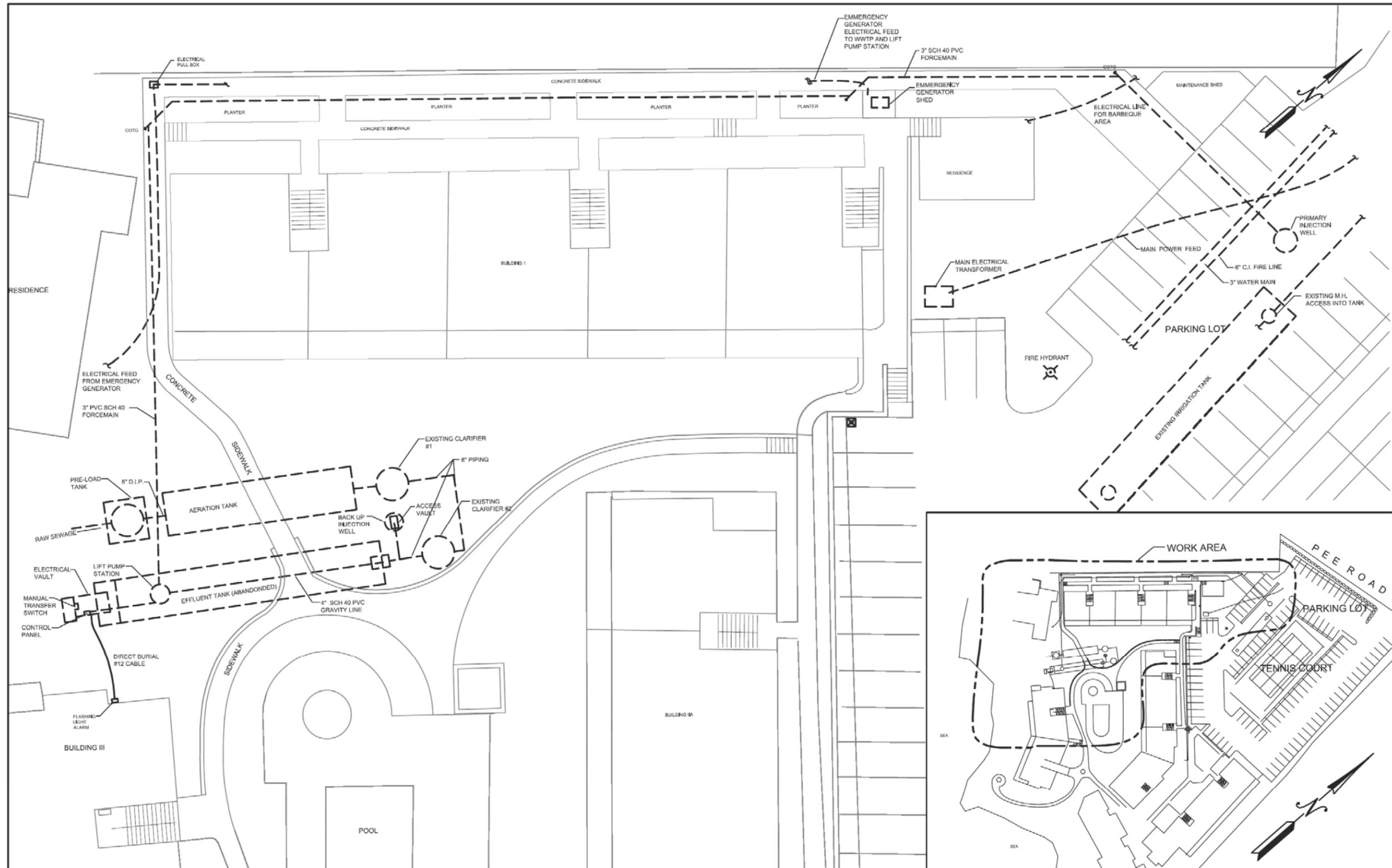
AOAO Makahuena at Poipu
1616 Pe'e Road
Koloa, Hawaii 96756

EA comments and responses received during the 30-day comment period will be placed here in the Final EA.

FIGURES



LOCATION MAP



EXISTING WWTP SITE PLAN

LOCATION PLAN



I HEREBY CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature: *Thomas A. Camarillo*
Date: April 30, 2010

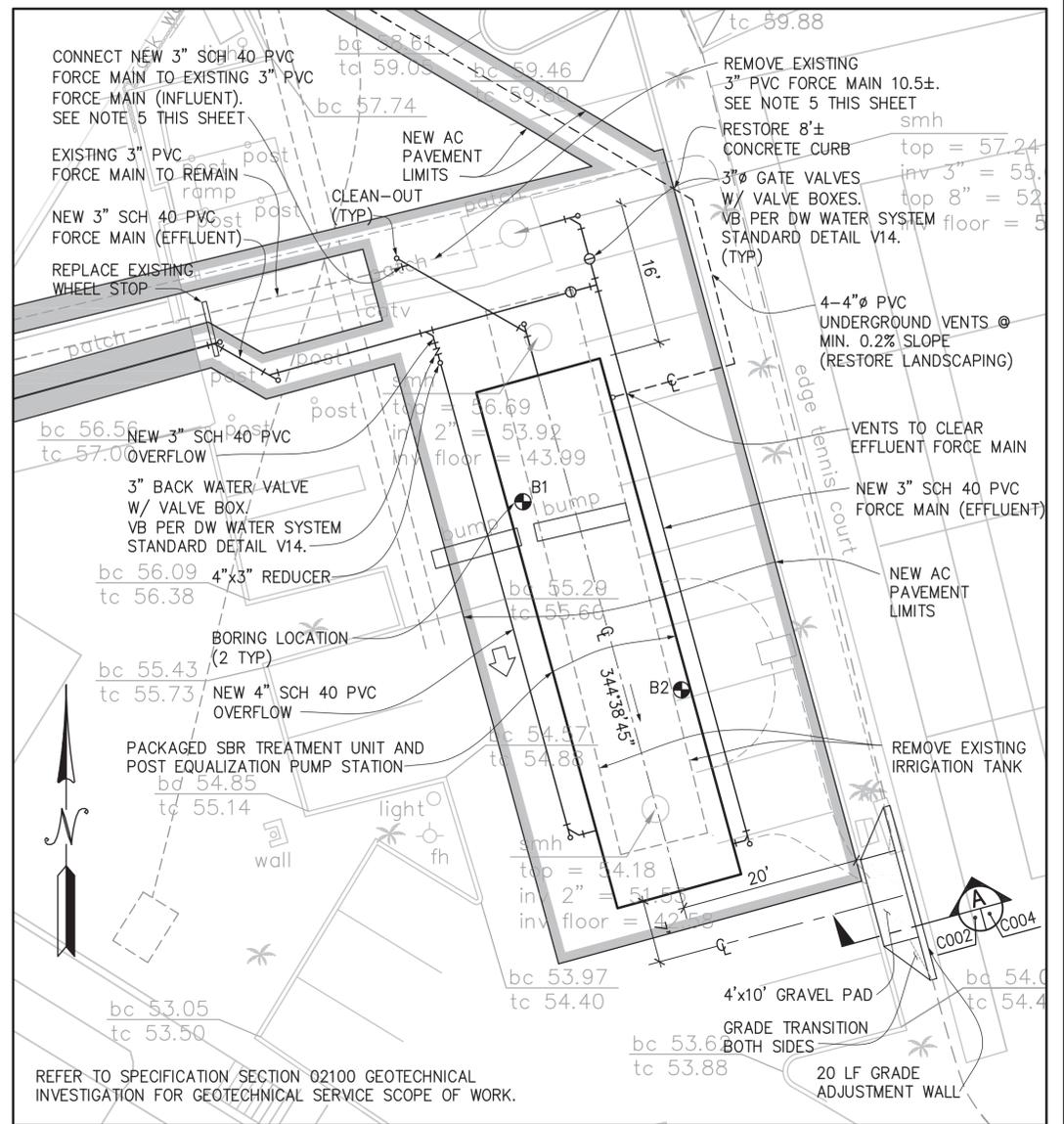
REVISIONS	BY
1. REVISED PER OWNER COMMENTS. ADDED NEW CONC. SIDEWALK. 03/17/2010	TAC

PROJECT TITLE: MAKAHUENA WASTEWATER TREATMENT PLANT AT PO'IPU WASTEWATER TREATMENT PLANT DESIGN
KŌLOA, HAWAII

DESCRIPTION:
SITE PLAN

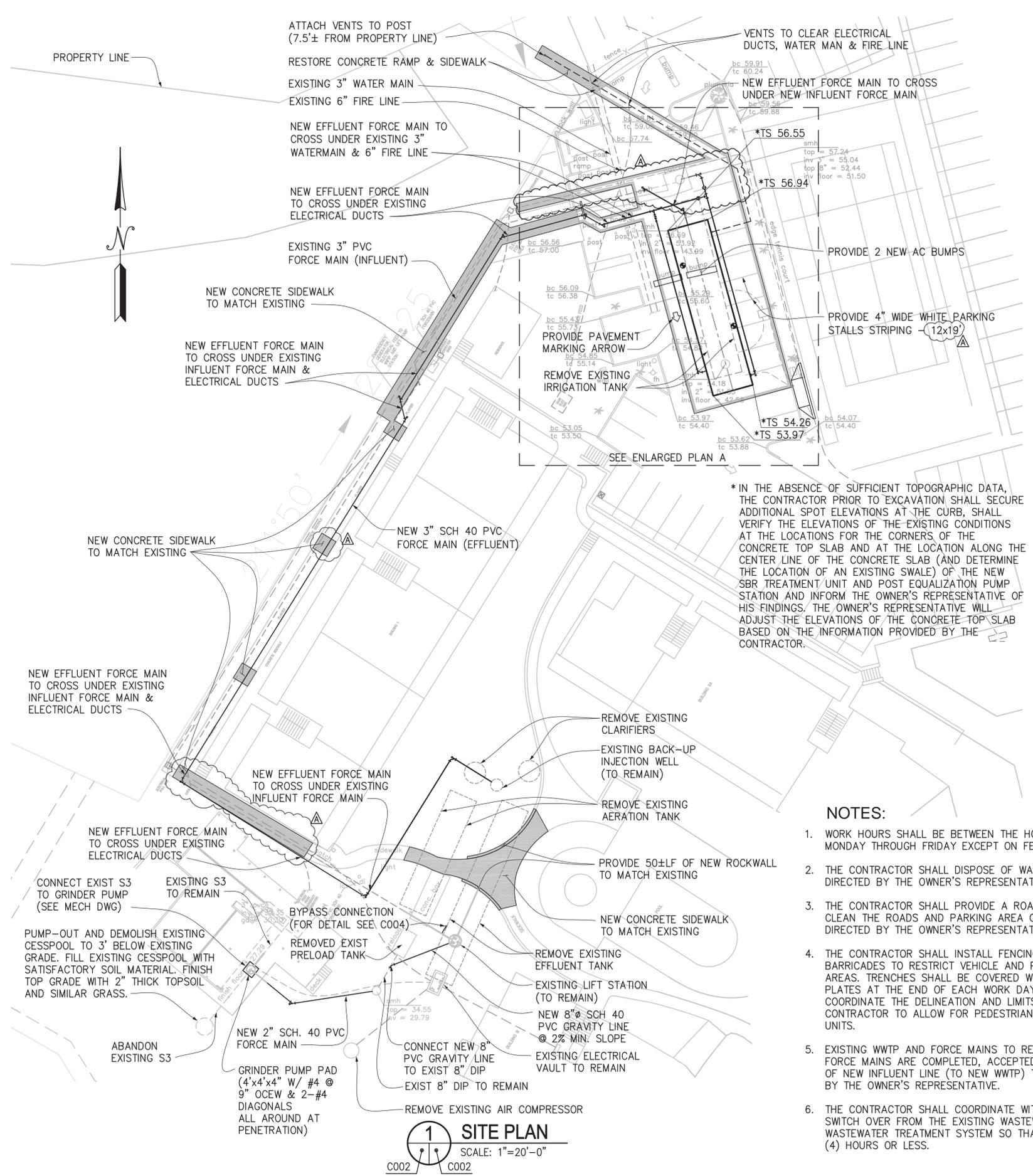
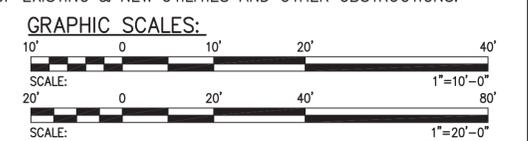
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C002



A
PACKAGED SBR TREATMENT UNIT AND POST EQUALIZATION PUMP STATION
ENLARGED PLAN
SCALE: 1"=10'-0"

- REFER TO SPECIFICATION SECTION 02100 GEOTECHNICAL INVESTIGATION FOR GEOTECHNICAL SERVICE SCOPE OF WORK.
- NOTES:**
1. WORK HOURS SHALL BE BETWEEN THE HOURS OF 8:00 A.M. AND 5:00 P.M. MONDAY THROUGH FRIDAY EXCEPT ON FEDERAL, STATE AND COUNTY HOLIDAYS.
 2. THE CONTRACTOR SHALL DISPOSE OF WASTE AND EXCESS MATERIAL DAILY AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
 3. THE CONTRACTOR SHALL PROVIDE A ROAD PAVEMENT SWEEPER/VACUUM AND CLEAN THE ROADS AND PARKING AREA OF DUST AND MUD PERIODICALLY AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
 4. THE CONTRACTOR SHALL INSTALL FENCING, BARRIERS AND FLASHING LIGHTED BARRICADES TO RESTRICT VEHICLE AND PEDESTRIAN ACCESS FROM THE WORK AREAS. TRENCHES SHALL BE COVERED WITH VEHICULAR TRAFFIC RATED STEEL PLATES AT THE END OF EACH WORK DAY. THE OWNER'S REPRESENTATIVE WILL COORDINATE THE DELINEATION AND LIMITS OF THE WORK AREAS WITH THE CONTRACTOR TO ALLOW FOR PEDESTRIAN ACCESS TO THEIR RESPECTIVE LIVING UNITS.
 5. EXISTING WWTP AND FORCE MAINS TO REMAIN OPERATIONAL UNTIL NEW WWTP AND FORCE MAINS ARE COMPLETED, ACCEPTED AND OPERATIONAL. PROVIDE CONNECTION OF NEW INFLUENT LINE (TO NEW WWTP) TO EXISTING INFLUENT LINE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
 6. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE THE SWITCH OVER FROM THE EXISTING WASTEWATER TREATMENT SYSTEM TO THE NEW WASTEWATER TREATMENT SYSTEM SO THAT THE SHUT DOWN IS MINIMIZED TO FOUR (4) HOURS OR LESS.
 7. PRIOR TO THE DEMOLITION AND REMOVAL OF THE EXISTING IRRIGATION TANK, THE CONTRACTOR SHALL PROVIDE TEMPORARY FLEXIBLE HOSE OR PIPE IRRIGATION WATER LINES AND CONNECTIONS TO REPLACE EXISTING WATER LINES THAT ARE IN THE WAY OF NEW IMPROVEMENTS AND TO MAINTAIN LANDSCAPE AND GRASS FEATURES. THE CONTRACTOR SHALL INSTALL APPROXIMATELY 60 LF OF 2"Ø PVC PERMANENT IRRIGATION LINES AROUND THE NEW WWTP TO REPLACE THE EXISTING WATER IRRIGATION LINES THAT WERE REMOVED UPON PROJECT COMPLETION TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
 8. PUMP OUT AND DEMOLISH EXISTING CLARIFIERS, AERATION TANK, AIR COMPRESSOR, PRELOAD TANK, AND EFFLUENT TANK TO 3' BELOW EXISTING GRADE AND FILL EXCAVATIONS WITH SATISFACTORY SOIL MATERIAL AND REPLACE EXISTING GRASS AND PLANTINGS WITH 2" THICK TOPSOIL AND SIMILAR GRASS AND PLANTINGS. AFTER PUMP-OUT AND PRIOR TO BACKFILLING, DRILL FOUR (4) 4-INCH DIAMETER HOLES AT THE BOTTOM AND LOW POINT OF EACH TANK FOR DRAINAGE.
 9. PROVIDE CONCRETE THRUST BLOCKS AT ALL PIPE BENDS.
 10. PROVIDE PRESSURE CLEANOUTS AT ALL PIPE BENDS.
 11. PROVIDE SHOP DRAWINGS OF THE LAYOUT AND PROFILES OF THE FORCE MAIN, GRAVITY & VENT PIPING INCLUDING FITTINGS, CLEANOUTS AND VALVES FOR REVIEW. SHOW CROSSINGS OF EXISTING & NEW UTILITIES AND OTHER OBSTRUCTIONS.



1
SITE PLAN
SCALE: 1"=20'-0"

* IN THE ABSENCE OF SUFFICIENT TOPOGRAPHIC DATA, THE CONTRACTOR PRIOR TO EXCAVATION SHALL SECURE ADDITIONAL SPOT ELEVATIONS AT THE CURB, SHALL VERIFY THE ELEVATIONS OF THE EXISTING CONDITIONS AT THE LOCATIONS FOR THE CORNERS OF THE CONCRETE TOP SLAB AND AT THE LOCATION ALONG THE CENTER LINE OF THE CONCRETE SLAB (AND DETERMINE THE LOCATION OF AN EXISTING SWALE) OF THE NEW SBR TREATMENT UNIT AND POST EQUALIZATION PUMP STATION AND INFORM THE OWNER'S REPRESENTATIVE OF HIS FINDINGS. THE OWNER'S REPRESENTATIVE WILL ADJUST THE ELEVATIONS OF THE CONCRETE TOP SLAB BASED ON THE INFORMATION PROVIDED BY THE CONTRACTOR.

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Plotted on: Mar 11, 2010 at 3:51 pm by: epelene



I HEREBY CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature: _____
Expiration date: April 30, 2010

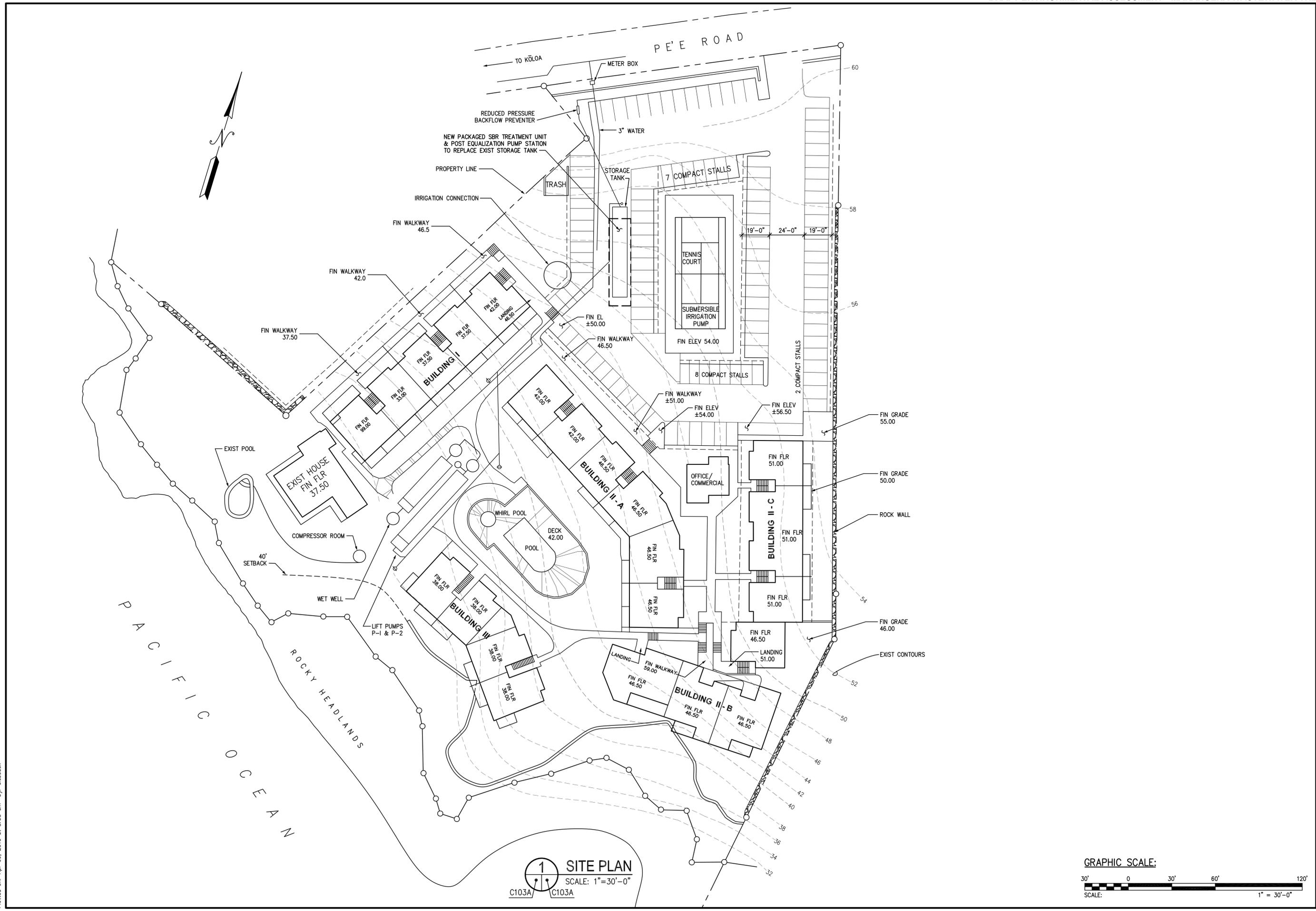
REVISIONS	BY

PROJECT TITLE: MAKAHUENA WASTEWATER TREATMENT PLANT AT PO'IPU WASTEWATER TREATMENT PLANT DESIGN
KŌLOA, HAWAII

DESCRIPTION:
DATE: 04/09/2010
SCALE: AS SHOWN
DRAWN: ENL
SHEET

C103A

FIGURE 3B



1 SITE PLAN
SCALE: 1"=30'-0"
C103A C103A



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Plotted on: Apr 09, 2010 at 8:58 am by: elebsoc

GMP INTERNATIONAL
ENGINEERS ARCHITECTS
1100 ALAKA STREET, SUITE 1800
HONOLULU, HAWAII 96813
Tel: (808) 521-4711
Fax: (808) 538-2889
Email: gmp@hawaii.com
www.gmpinternational.com



I HEREBY CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature: *Tom V. Camarillo*
Expiration date: April 30, 2010

REVISIONS	BY
ADDED NEW SHEET. 03/11/2010	TAC

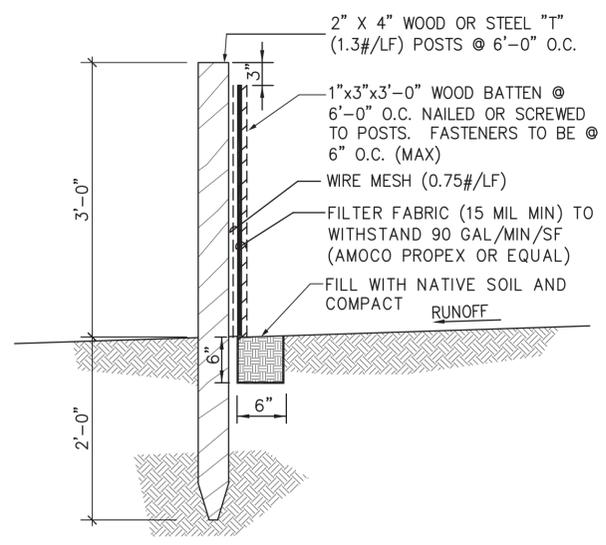
PROJECT TITLE: MAKAHUENA WASTEWATER TREATMENT PLANT AT PO'IPU WASTEWATER TREATMENT PLANT DESIGN
KŌLOA, HAWAII

DESCRIPTION: EROSION CONTROL AND GRADING PLAN

DATE: SCALE: AS SHOWN
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BEST MANAGEMENT PRACTICES
EROSION CONTROL NOTES:

- SILT FENCES SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING AND ON THE DOWNHILL SIDE OF ALL SLOPES BEING GRADED.
- SILT FENCES SHALL BE IMMEDIATELY REPAIRED WHEN DAMAGED DURING CLEARING AND GRUBBING OR GRADING OPERATIONS.
- STOCKPILES:
STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS OR OTHER AREAS OF CONCENTRATED FLOWS. SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED AROUND THE BASE OF THE STOCKPILES.
- DUST CONTROL:
DUST CONTROL SHALL BE APPLIED TO REDUCE DUST EMISSIONS. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII STATE - HAWAII ADMINISTRATIVE RULES: CHAPTER 11-60, "AIR POLLUTION CONTROL".
- SEDIMENT BARRIERS OR TRAPS:
SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED DOWN SLOPE OF ALL DISTURBED AREAS AND AROUND THE BASE OF ALL MATERIAL STOCKPILES.
- SLOPE PROTECTION:
SURFACE FLOW FROM ABOVE AND EXPOSED SLOPE SHALL NOT BE ALLOWED TO FLOW OVER THE SLOPE WITHOUT PROTECTION. SLOPE PROTECTION SHALL BE USED ON ALL AREAS WITH SLOPES GREATER THAN 50% AND ON AREAS OF MODERATE SLOPES THAT ARE PRONE TO EROSION.
- INLET PROTECTION:
ALL STORM DRAIN INLETS ON SITE, AND THOSE OFFSITE WHICH MAY RECEIVE RUNOFF FROM THE SITE SHALL USE AN INLET PROTECTION DEVICE.
- GRASS SHALL BE ESTABLISHED ON DISTURBED AREAS WHICH ARE AT FINAL GRADE OR WILL NOT BE WORKED FOR LONGER THAN 14 DAYS. ALTERNATIVES TO GRASS INCLUDE 2" MINIMUM STRAW MULCH COVER, EROSION BLANKETS WITH ANCHORS, 6-MIL PLASTIC SHEETS, SEDIMENT TRAPS OR PONDS, OR INTERCEPTOR DIKES/SWALES.
- PERMANENT STABILIZATION:
ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO REMOVING EROSION AND SEDIMENT MEASURES. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND AREAS OF DISTURBED SOIL WHICH RESULT FROM THE REMOVAL OF THE TEMPORARY MEASURES SHALL BE IMMEDIATELY PERMANENTLY STABILIZED.
- CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF SITE THE SILT FENCES WHEN THE PROJECT IS COMPLETED AND THE GRASS IS ESTABLISHED.



2 DETAIL - SILT FENCE

SCALE: NTS
C002A C002A

GRAPHIC SCALE:



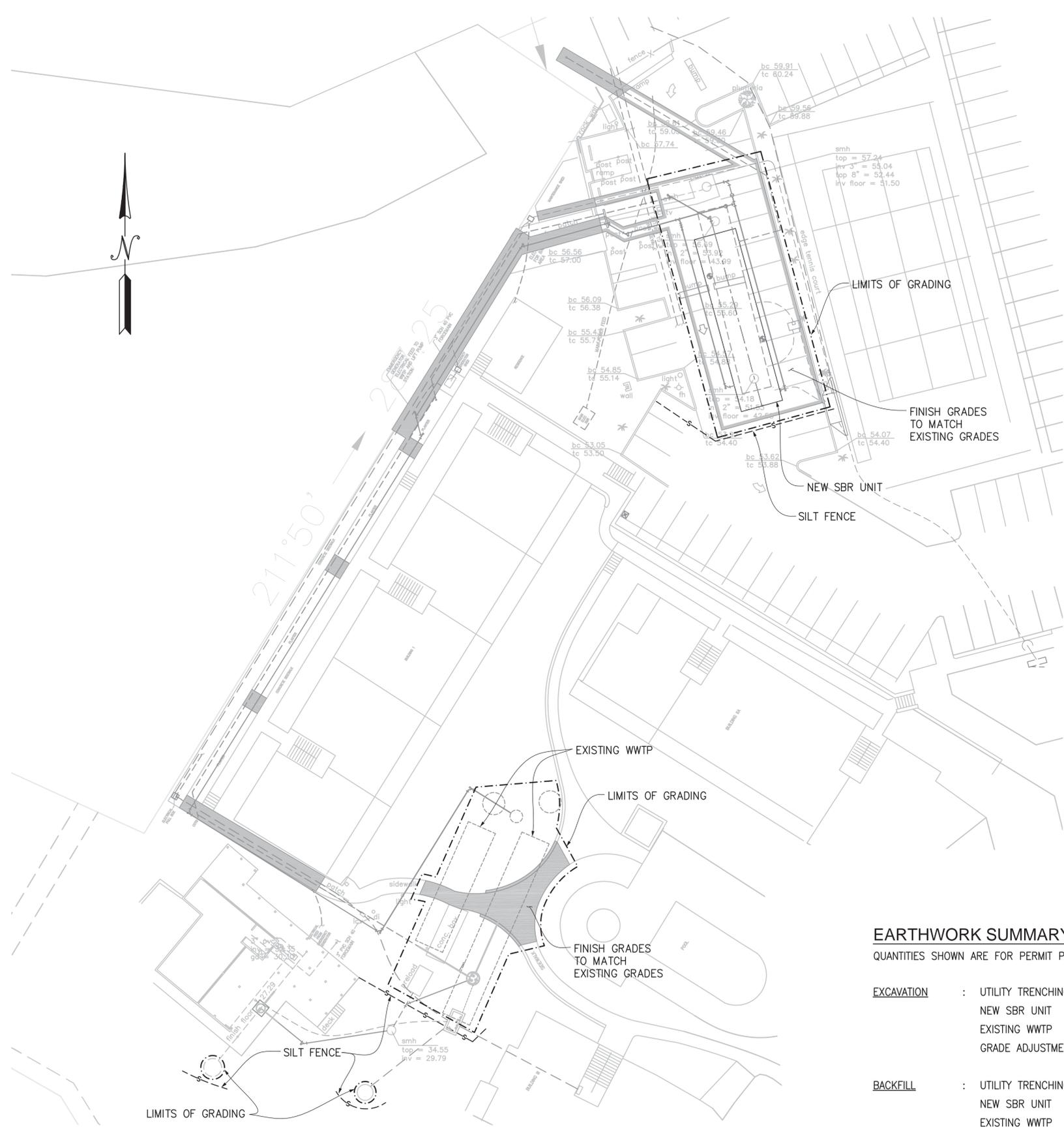
EARTHWORK SUMMARY

QUANTITIES SHOWN ARE FOR PERMIT PURPOSES ONLY

EXCAVATION	UTILITY TRENCHING	127	CY
	NEW SBR UNIT	821	CY
	EXISTING WWTP	39	CY
	GRADE ADJUSTMENT WALL	3	CY
BACKFILL	UTILITY TRENCHING	117	CY
	NEW SBR UNIT	542	CY
	EXISTING WWTP	188	CY
GRADED AREA	NEW SBR TREATMENT UNIT	0.08	AC
	EXISTING WWTP	0.06	AC

1 EROSION CONTROL AND GRADING PLAN

SCALE: 1"=20'-0"
C002A C002A



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