Sustainable Design & Consulting LLC
Practical Sustainability

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May 27, 2021

Dr. Keith Kawaoka, Acting Director
Office of Environmental Quality Control (OEQC)
State of Hawai'i
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Sent electronically:

Subject: Request for Publication
Final Supplemental Environmental Impact Statement
Kapa'a Light Industrial Park - Kailua
Tax Map Keys 4-2-015: 013 and 014

Dear Dr. Kawaoka,

Please publish the attached Final Supplemental Environmental Impact Statement in the next edition of "The Environmental Notice", in accordance with Hawaii Administration Rules Section 11-2001-30(d).

An earlier file version of the FSEIS which was posted in the May 23, 2021 edition of The Environmental Notice had a technical problem where the Appendices were missing from the file. We have corrected the problem and we would like to ask you to publish the updated file.

Should you have any questions, please contact Manfred Zapka, at (808) 265 6321 or sustainabledc@gmail.com.

Sincerely,
Sustainable Design & Consulting LLC

Manfred Zapka

Manfred J. Zapka, PhD, PE
Principal

Attachment: PDF of FSEIS report (will be uploaded to OEQC)

21-162

Letter to: Dr. Bruce S. Anderson, PhD., Director
Attn.: April Matsumura, DOH Wastewater Branch, January 7, 2019, Page 2 of 2

Cc: Zack Stoddard, Land Use Approval Branch

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Friday, May 28, 2021 2:48:47 AM

Action Name

Kapa'a Light Industrial Park

Type of Document/Determination

Final environmental impact statement (FEIS)

HRS §343-5(a) Trigger(s)

- (6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation

Judicial district

Koʻolaupoko, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 4-2-015:013; (1) 4-2-015:014

Action type

Applicant

Other required permits and approvals

numerous

Discretionary consent required

zone change

Approving agency

City and County of Honolulu Department of Planning and Permitting

Agency contact name

Zachary Stoddard

Agency contact email (for info about the action)

zachary.stoddard@honolulu.gov

Email address or URL for receiving comments

sustainableDC@gmail.com

Agency contact phone

(805) 768-8019

Agency address

650 South King Street
Honolulu, Hawaii 96822
United States
Map It

Accepting authority

City and County of Honolulu Department of Planning and Permitting

Applicant

KAPAA I, LLC and KAPAA III, LLC

Applicant contact name

John and Paul King

Applicant contact email

sustainableDC@gmail.com

Applicant contact phone

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Map It

Was this submittal prepared by a consultant?

Yes

Consultant

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Consultant address

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Honolulu, HI 96825
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Map It

Action summary

A supplemental EIS is being prepared for modifications to the Kapa'a Light Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the storm water management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, roadway access and a relocated powerline. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the 2011 EIS.

Attached documents (signed agency letter & EA/EIS)

- SDC-Kapaa-FSEIS-Transmittal-letter-to-OEQC-May-27-2021.pdf
- FSEIS-Kapaa-LIP-Report-with-Appendices-April-2021-MOD.pdf

Shapefile

- The location map for this Final EIS is the same as the location map for the associated Draft EIS.

Authorized individual

Manfred Zapka

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FINAL

For Activities to Develop the

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Report with 12 Appendices

April 2021

Draft SEIS was submitted in November 2020

Sustainable Design & Consulting LLC
Practical Sustainability

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PROJECT SUMMARY

Project Summary

Project Name:	Kapa'a Light Industrial Park
Accepting Agency:	City & County of Honolulu, Department of Planning and Permitting
Location:	Kailua, Oahu, Hawaii
Tax Maps Keys	[1] 4-2-15:13 and (1) 4-2-15:014; Note: The former land parcels TMK 4-2-15:006 and 012, referenced in the FEIS, have been consolidated into the new TMK 4-2-15:014 and the former TMK 4-2-15:008 has been changed to 4-2-15:013.
Land Area:	The 57-acre project site stretches over portions of TMK 4-2-15:013 and 014, which have a combined land area of 79 acres. The project site includes a "Lower" and an "Upper" portion. The Lower portion of the project site is situated within a portion of TMK 4-2-15:014 and the Upper portion stretches over TMKs 4-2-15:013 and a portion of 014. The project site is being developed under a Joint Development Agreement (Conditional Use Permit (CUP) No. 2015/CUP-70)
Applicants:	KAPAA I, LLC and KAPAA III, LLC
Recorded Fee Owners:	KAPAA I, LLC and KAPAA III, LLC
Existing Use:	In the Upper portion of the project site there are 35 existing warehouse structures and 3 acres of outdoor equipment storage. In the Lower portion of the project site there are approximately 10 acres of outdoor equipment storage, and there are no permanent buildings.
State Land Use District:	Urban; the entire project site is within the Urban State Land Use District.
Special Management Area:	The Lower portion of the site is within the SMA area.
City and County of Honolulu Zoning:	Limited Industrial (I-1) / General Preservation (P-2)
Flood Zone Designation:	A / D / X

Project Summary

Proposed Action:	The Proposed Action is the development of a new portion of the updated site development plan of the Kapa'a Light Industrial Park, in Kailua, Oahu. The Proposed Action is consistent with the site development goals described in the 2011 FEIS and further developed and approved under subsequent land use permits, including Land Use Zone Change and Special Management Area Use Permit (SM), with two SMP Minor Modifications. The development within the project site will serve to construct warehouse structures for small services providers and light industrial uses, providing much needed light industrial space in the Koolau Poko region of Oahu. The Proposed Action would, however, modify certain site development strategies delineated in approved 2011 FEIS, to align with subsequent site design modification and further developed impact mitigation strategies. Modifications of the site development strategies were required to accommodate design constraints due to a new site layout and satisfy more stringent permitting requirements that were introduced after the accepted 2011 FEIS was approved. The Proposed Action proposes a new design for storm water treatment, among other site development changes, since the approved design is not feasible based on a recent soil engineering investigation. The new design for storm water will be more effective than the previous and currently approved design because of better pollutant removal and better flood control.
Impacts:	Analysis of the following environmental resource criteria will be addressed in the Draft SEIS: • Climate and Climate Change • Geology • Topography • Soils • Surface Waters • Groundwater • Flora • Fauna • Historic and Archaeological Resources • Cultural Resources • Air Quality • Noise

Project Summary

	• Visual Resources • Socio Economic Characteristics • Public Services and Facilities • Infrastructure, Traffic, and Utilities • Cumulative Impacts
Determination:	In accordance with HAR Section 11-200.1-30 (b) (Supplemental environmental impact statements) the Accepting Authority has the authority whether a Supplemental Environmental Impact Statement (SEIS) is required. A SEIS refers to an additional environmental impact statement that prepared for an action for which a FEIS was previously accepted, but which has since changed substantively in size, scope, intensity, use, location, or timing, among other things. A SEIS is warranted when the scope of an action has been substantially increased, when the intensity of environmental impacts will be increased, when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts or their mitigation not previously dealt with. The Accepting Agency has determined that a SEIS is required.
Agency Consulted in SEISPN Process:	City & County of Honolulu, Department of Planning and Permitting Point of Contact: Mr. Zachary Stoddard Zachary.Stoddard@honolulu.gov
Consultant:	Manfred Zapka, Ph.D., P.E. Certification: CIEC, LEED AP, WELL AP, CEM Sustainable Design & Consulting LLC P.O. Box 25914, Honolulu, HI 96825 Tel: 808 265 6321 sustainableDC@gmail.com https://greatplacesandspaces.com/sustainabledesign

FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

KAPA'A LIGHT INDUSTRIAL PARK

APRIL 2021

This Final Supplemental Environmental Impact Statement and all ancillary documents were prepared under the signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in Chapter 343, Hawai'i Revised Statues, and sections ll-z0,A-n and 11-200-18, Hawai'i Administrative Rules, as applicable.

Applicants:

Kapa'a I, LLC and Kapa'a III, LLC

May 4, 2021

Paul King, Managing Member
Kapa'a I, LLC

Date

May 4, 2021

John King, Managing Member
Kapa'a III, LLC

Date

Accepting Authority:

City & County of Honolulu
Department of Planning and Permitting

EXECUTIVE SUMMARY

Overview and Background

The Proposed Action is the continuation of development of the Kapa'a Light Industrial Park (KLIP) under an updated site development approach. The KLIP project site extends over two adjoining parcels TMK [1] 4-2-15:013 and 014. The development of the KLIP occurs on two land portions of the project site, the Lower and the Upper portion, which have different grade elevation and are located on Eastern and Western side of the project site, respectively.

At present, the Upper portion of the project site has 35 existing warehouse structures and 3 acres of outdoor equipment storage, which are leased by companies of diverse sizes. Within the next 2 to 3 years, seven more warehouse structures are planned for the Upper portion of the project site. At present, initial site preparation work is underway within the Lower portion of the project site. This includes initial mass grading.

In 2011 the Final Environmental Impact Statement (FEIS) was approved for the land of the Proposed Action. At that time, the EIS process was triggered by the zone change application from General Preservation (P-2) to limited Industrial (I-1) for portions of the former parcels TMK 4-2-15:006 and 012. The parcels TMK 4-2-15:006 and 012 have since been consolidated to the new TMK 4-2-15:014 designation. The zone change was required to commence site development for a next phase of the KLIP expansion on the two portions of parcel TMK 4-2-15:014. Furthermore, the approved FEIS was required for the Special Management Area Use Permit (SMP) for the Lower portion of the project site.

In the time since the 2011 FEIS was approved, development conditions for the KLIP as well as environmental impact mitigation technologies and permit requirements for the site development have changed. In general, permit requirements have become more rigorous. This has caused the Applicants of the KLIP, the Kapa'a I, LLC and Kapa'a III, LLC, to seek changes in the site development approach. The new site development approach of the Proposed Action offers higher levels of impact mitigation than the approach that was disclosed in the approved 2011 FEIS and the subsequent Special Management Area Use Permit (SMP), including subsequent SMP minor modifications.

Link to download the 2011 FEIS http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2011-10-23-OA-FEIS-Acceptance-Kapaa-Light-Industrial-Park.pdf

General

This Final ~~Draft~~ Supplemental Environmental Impact Statement (F~~D~~SEIS) examines potential environmental impacts of the developing Kapa'a Light Industrial Park, in Kailua on the windward side of Oahu, under the Proposed Action. The FSEIS responds to comments received after publication of the Draft SEIS (DSEIS). Since some of comments required a more detailed description of impact mitigation measures, additional technical details are presented in the FSEIS as 12 Appendices.

Summarizing, the goals of the Proposed Actions are:

- To develop and implement a site development approach that is based on low impact development strategies to mitigate impacts to the environment and the community.
- To upgrade impact mitigation strategies from the earlier proposed strategies in the approved 2011 FEIS.
- To provide industrial zoned space so that specific needs within the windward Koolau Poko region of Oahu can be met and in concert with the General Plan current Sustainable Communities Plan.
- To continue supporting businesses and residents on windward Oahu with high quality industrial zoned space for businesses so that longer commutes and trips to alternative sites on the leeward side can be avoided and the financial sustainability of windward businesses can be supported.
- To work with the appropriate agency and community stakeholders so that optimized development strategies can be implemented, and a high project development synergy can be created, which serves the interest of the community as well as KLIP.

The Accepting Agency, the City & County of Honolulu, Department of Planning and Permitting, has determined that a Supplemental Environmental Impact Statement (SEIS) is required to implement the updated site development approach. This determination is that the Proposed Action represents substantive changes in scope, intensity, use, or timing, among other things, from the conditions disclosed in the accepted FEIS.

This ~~Draft~~ Final Supplemental Environmental Impact Statement (FSEIS) is prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes, Act 241, and Chapter 200 -1 of Title 11, Department of Health Hawaii Administrative Rules, "Environmental Impact Statement Rules". The DSEIS documents potential environmental impacts of the proposed project and evaluates proposed impact mitigation measures.

The Kapa'a Light Industrial Park (KLIP) is situated to the West of Kailua town, on the island of Oahu. The KLIP stretches over 57 acres in the Lower stretches of the Kapa'a Valley, which is the watershed of the Kapa'a Stream. The KLIP is located on two contiguous land parcels, TMK 4-2-15:013 and 14, with a total land area of 79 acres. The two parcels are owned by members of the King family, who are longtime residents of Kailua and the land is developed under a joint development agreement.

The development of the KLIP started some 30 years ago when the founder, Mr. John King, started to offer leasable base yard land and soon after he built the first permanent warehouse structure at the project site. Growing over time there are presently 35 warehouses at the KLIP site, with building footprints ranging between 3,000 sqft to 24,000 sqft. The existing warehouses and those under active development are located within the Upper portion of the KLIP, within the TMK 4-2-15:013 and the Western portion of 4-2-15:014.

The KLIP has been playing an important role for the economic infrastructure of the windward side of Oahu. Businesses on the windward side have been at pains to find suitable places for their businesses

close to home and/or close to their windward customer base. Availability for industrial zoned land on the windward side will be flat or reduced, as existing industrial zoned space is converted to other use.

Providing sufficient, modern, and sustainably designed leasable space on the windward side for small service and light industrial businesses is a significant benefit to the community and the environment. The Applicants are meeting this present and future demand for leasable industrial zoned space by developing both the Upper and Lower portion of the project site, and in building out the overall plan over time in a manner consistent with market demand and community needs.

Even before more recent governmental requirements for low impact development strategies became mandatory, the Applicant made a commitment to use site development strategies and technologies that cause less impacts to the environment and the community than strategies that were typically used. The KLIP site is located upstream of the important Kawainui Marsh, Hawaii's largest and Ramsar certified wetland area, and the adjacent Kapa'a Stream corridor, which also includes wetland areas. The protection of aquatic resources has been a key commitment by the Applicants for the further development and operation of the KLIP.

Since the KLIP is located on a former landfill, site development strategies are more demanding than on land with regular soil. For the project site, selected conventional development and construction strategies as well as impact mitigation strategies will have to be replaced with strategies that consider soil conditions on a former landfill.

Alternatives

This Final ~~Draft~~ SEIS document presents two alternatives, the SEIS Preferred Alternative and the SEIS No-Action Alternative. The prefixes "FEIS" and "SEIS" are used in this Final ~~Draft~~ SEIS to distinguish between the 2011 FEIS and the 2021 SEIS alternatives.

The two SEIS alternatives differ from each other by whether the updated site development plan is used. The SEIS Preferred Alternative uses the updated site development plan, while the SEIS No-Action Alternative uses that which was already approved. The SEIS No-Action Alternative uses the site development approach that is based on the approved design concepts from the 2011 FEIS, the 2013 zone change and the 2014 SMP and the subsequent 2017 SMP minor modifications. The flow chart in Figure A describes the differences of the alternatives.

Under the updated site development, and therefore under the SEIS Preferred Alternative, the warehouse footprint in the Lower portion of the project site would have about 373,000 sqft, or 35,000 sqft. more than under the 2011 FEIS site development plan. Since the SEIS No-Action Alternative would be the same as under the 2014 SMP minor modification, the SEIS No-Action Alternative would have a 3.4-acre base yard and 217,000 sqft warehouse footprint. Under the SEIS Preferred Alternative the area of the 3.4-acre base yard would be used to build warehouses. The updated site development plan considers a range of design changes and includes new and more efficient impact mitigation measures.

A major difference between the two SEIS alternatives is the storm water treatment and management approach. Specifically, the SEIS No-Action Alternative would use the storm water design that was approved under 2017 SMP modification (2017/MOD-37). This storm water approach combined vegetated swales and below ground detention vaults, thus used low impact development strategies. Under this storm water system runoff would flow to vegetated swales and enter below ground detention vaults, where the runoff would infiltrate and migrate below ground and under the site perimeter berms.

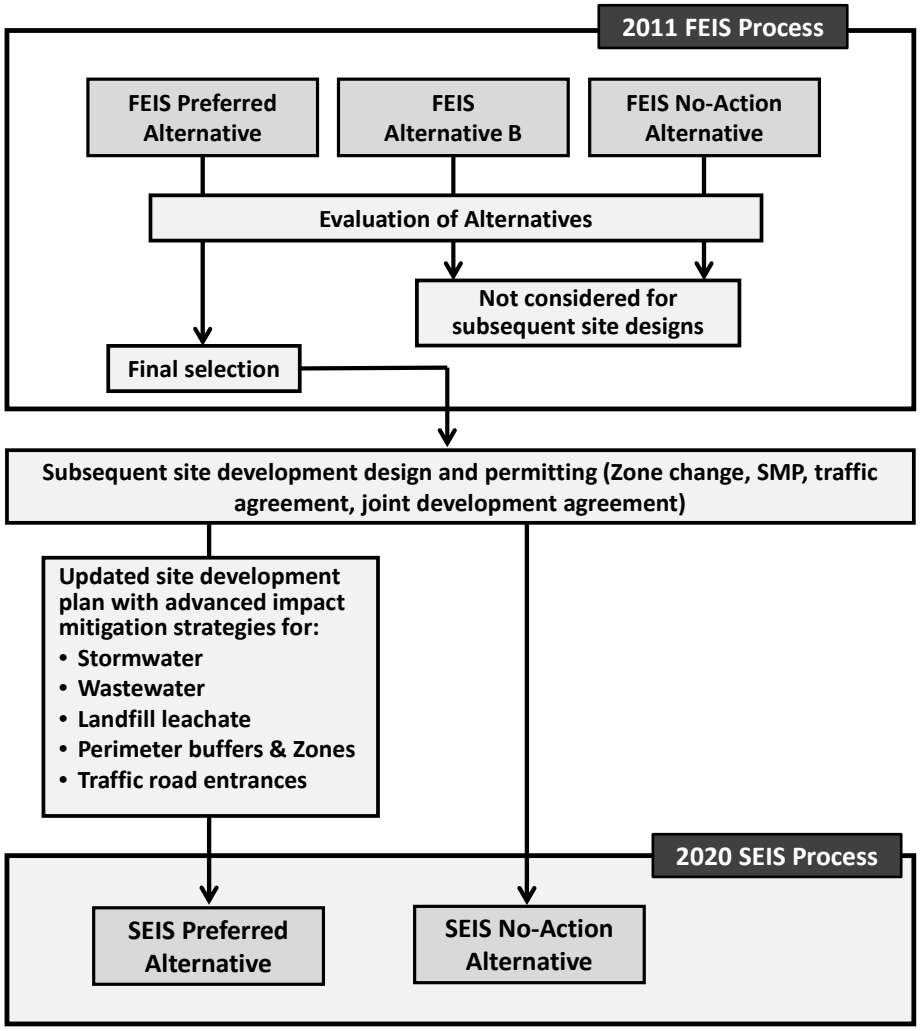

Figure A: Flow chart for alternatives referred to in the SEIS document

A geotechnical report completed in 2019 (Stewart Engineering, 2019) determined that the storm water treatment and management approach approved in the 2017 SMP minor modification could not be implemented since infiltration and subsequent migration of infiltrated water under the perimeter earth berm would contribute to perimeter berm instability. Consequently, a different storm water treatment and management strategy was completed which is part of the updated site development plan. This updated storm water plan necessitates an increase of the finish grade elevation to provide the

necessary hydraulic energy for gravity flow of storm water runoff to the treatment facilities at the Northern site perimeter.

In addition, the updated site development plan proposed the use of advanced onsite wastewater treatment in the entire project site. This advanced wastewater treatment technology would significantly reduce environmental impacts caused by treated wastewater disposal on-site. The advanced wastewater treatment would significantly reduce organic, TSS and nutrient loads in the effluent.

Table B shows the nine site development elements of the SEIS Preferred Alternative versus previous site development plans, including the SEIS No-Action Alternative.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
A	Storm water drainage and treatment technology; keeping detention vaults and adding filtration Manufactured Treatment Device (MTD) and vegetated buffer strips as storm water treatment	More stringent storm water permit guidelines require adjusting the storm water approach, and design constraints require different drainage and treatment. Since storm water discharge without effective treatment can affect the important aquatic resources downstream of the project site. Therefore, effective treatment is important and would be enhanced.	The efficacy of impact mitigation will be enhanced.
B	Rainwater harvesting for irrigation – keeping the amount of harvested storm water but changing the use to irrigation.	Less vegetated area in the site interior would require less harvested storm water for irrigation. But more irrigation of the site perimeter would balance the need for harvest rainwater.	Efficacy of impact mitigation remains the same.
C	Site finish grade elevation of the elevation of the project site grade would need to be increased.	Finish grade needs to be raised to provide sufficient hydraulic flow energy for gravity flow of runoff to treatment units and discharge from the site.	Efficacy of impact mitigation remains the same.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
D	Site perimeter berms would have increased height and width; dense vegetation cover with tall trees would be used on the new berms serving as vegetated buffer zone.	The site perimeter berms would have to be increased in height to accommodate the increased finish grade elevations.	Efficacy of impact mitigation remains the same.
E	Pervious and vegetated areas inside the project site would be reduced	Less storm water percolating into the landfill body would reduce the amount of harmful leachate.	Efficacy of impact mitigation would be enhanced.
F	Irrigation area would be limited to the vegetated buffer zone	Less vegetated areas within the site interior would require less irrigation.	Efficacy of impact mitigation remains the same.
G	Wastewater treatment technology; would use advanced onsite wastewater treatment technology.	New wastewater treatment technology would be used that is more effective than the previously used conventional septic systems.	Efficacy of impact mitigation would be enhanced.
H	Changed site road access: would use a single roadway entrance at a different location	The new site road access location would offer better visibility and a less complicated traffic flow, thus Lower traffic risks.	Efficacy of impact mitigation would be enhanced.
I	Changed layout of buildings would result in better internal layout with improved traffic areas; while the building arrangements would be changed, the overall building footprint would remain basically the same as in the 2011 FEIS.	Internal site layout was optimized by improving the accessibility of the buildings and the layout of the traffic areas. The previously planned 3.4-acre base yard would be removed and buildings would be constructed inside this area.	Efficacy of impact mitigation remains the same.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
J	Relocation of the existing 4 kV power line in the Lower site: A section of the 4 kV power line which supplies the KLIP and the Kapa'a Transfer Station with electricity passes through the Lower site. This section of the power line needs to be removed and replaced with a section outside the Lower site.	The relocation of the power line was planned, and it was decided to include the proposed action, which is the relocation of the section of the 4 kV power line, in this environmental review of the FSEIS.	The Proposed Action (relocation of the 4 kV power line) will not affect the other impact mitigation measures at the site. The Proposed Action (relocation of the 4 kV power line) has its own impact mitigation measures.

Possible environmental impacts and impact mitigation

Significant issues and impacts associated with the two SEIS alternatives are described below.

Geology, topography, and soils: For the SEIS Preferred Alternative and the SEIS No-Action Alternative about 27 and 22 acres of the project site would be converted from pervious to impervious land, respectively. Before construction, the project would require an approved erosion and sediment control plan and applicable permits, which would require appropriate site-specific best management practices (BMPs) for controlling runoff, erosion, and sedimentation during construction.

Water Resources: Under both action alternatives, the implementation of erosion and sediment control plans would be required to reduce soil erosion, Lower runoff flow rates and capture eroded soils and concentrated nutrients before they enter the receiving water. Storm water runoff during construction would be controlled by specific stormwater BMPs and erosion and sediment control plans for phases of the development would have to follow guidelines for the NPDES general permit coverage. Structural and non-structural management practices would be implemented for the operation of the proposed industrial park.

Under both SEIS alternatives, all storm water runoff from impervious areas would be captured in drain inlets, conveyed by drainpipes to treatment facilities at the site perimeter and subsequently released to the receiving water. Pollutants in the storm water runoff would be significantly reduced through the comprehensive treatment. Furthermore, the detention vaults would be sized to capture sufficient volumes of storm water runoff to avoid high peak flow rates during heavy rain events. The volume of storm water which would bypass the detention vaults would be relatively small.

The storm water treatment and management approach under the SEIS No-Action Alternative, which is the same approach as approved under the 2017 SMP minor modification, was found not feasible

by a soil engineering report. The storm water approach under the 2017 SMP minor modification used infiltration of all runoff adjacent and upstream of the site perimeter berms, which was likely to jeopardize berm stability.

The storm water treatment and management approach under the SEIS Preferred Alternative would avoid these constraints. Under the SEIS Preferred Alternative, storm water runoff would be conveyed to vegetated buffer strips. After running through these buffer strips where vegetation would filter out pollutants, the runoff would enter detention vaults. Runoff detained in these detention vaults would be released and run through manufactured treatment devices (MTD) which would filter the runoff to remove all but the smaller solid fractions in the storm water. Runoff would be discharged to the Kapa'a Stream corridor via an armored outfall.

The DSEIS describes impacts from leachate which could be released from rainwater percolating through the landfill. The leachate could cause significant impacts to aquatic resources adjacent to the project site. Harmful leachate is generated when water infiltrates into the landfill body entraining pollutants which are discharged downstream to the environment if not contained and treated. The landfill at the project site lacks an underground seal, such as an impermeable barrier, to protect potential harmful leachate to seep into the groundwater. Therefore, leachate cannot be contained and treated at the project site. Thus, the proven way to avoid adverse impacts from leachate is to avoid its generation by creating an impervious cover on the landfill.

The DSEIS describes positive effect of the Proposed Action on the overall water quality of the Kapa'a Stream since the stormwater discharge of the Proposed Action would reduce pollutants compared with pre-construction conditions.

Biological Resources: The Proposed Action would convert only land that is presently graded and has no vegetation. No open space, natural vegetated land or mature forest habitat would be used for the development footprint of either alternative. Under both action alternatives, rare and endangered species would not be affected since the existing condition of the project site is only habitat for a population of urbanized birds and small mammals but no endangered species. The adjacent Kawainui Marsh is habitat for federally listed water birds and no land of the marsh will be used for the Proposed Action.

Air Quality: Impacts on air quality would be primarily through increased traffic on the adjacent roads. The Proposed Action would not emit air pollutants from power generation or process heat. Some minor air impacts within the proposed project could result from dust and the operation of engines. Some air impacts would be expected from diesel operated vehicles, such as trucks. While there would be a significant increase of project related heavy vehicle traffic on the section quarry road with the highest traffic volume after full build out, it is expected that air quality impacts would not significantly increase relative to the background traffic. Recent regulations for diesel engines exhaust and cleaner diesel would reduce the air quality impact of heavy vehicles over time.

Noise: Construction noise would occur under both SEIS alternatives but would be short-term. It is expected that no sensitive receptors are located within the range of construction noise. Traffic

related noise would be similar under both SEIS alternatives, while the SEIS would contribute more to the ambient noise. The increased noise impacts due to the expected increases in traffic would be typically below threshold of a discernible difference to the human ear. The expected noise impacts would remain within the range typical for urban regions. Noise impacts during operations are not expected to be at significant levels and would occur in industrially zoned land where some level of noise could be expected.

Traffic: The expected increase in traffic is a function of trips generated per unit of warehouse space. Though the SEIS Preferred Alternative would have more warehouse footprint than the SEIS No-Action Alternative, the SEIS No-Action Alternative would have a base yard, which the SEIS Preferred Alternative does not have. The base yard footprint approximately equals the added warehouse footprint. It is estimated that traffic caused by the Proposed Action is about the same under both SEIS alternatives since the traffic rates of the removed base yard and added warehouse footprint would balance the two alternative. A traffic impact assessment report (TIAR), conducted for the 2011 FEIS, estimated the level-of-service (LOS) on two roadways and three intersections. The LOS levels on both roadways, the Kapa'a Quarry Road, and the Kapa'a Quarry Access Road, were predicted to remain better than a LOS level, which would require traffic impact mitigation, for the current state of project development. But the Proposed Action would have unacceptable LOS for intersections at full build-out and would therefore require traffic mitigation measures.

The Applicant plans to conduct an updated TIAR after the updated site development plans are approved. New LOS projections would determine what type and what scope the traffic impacts mitigations would need to be. The road entrance to the project site differs between the two SEIS Alternatives. The SEIS No-Action Alternative would have two road access to the Lower site, whereas the SEIS Preferred Alternative would only have a single road access. The single road access was chosen because of more practical access to the project site, lower traffic risks through better traffic flow, and improved sight distance. The road access to the Upper site would be identical for the two SEIS alternatives.

Infrastructure: Impact on the infrastructure would have small differences between the two SEIS alternatives since the SEIS Preferred Alternative would have more warehouse footprint but no base yard area. The demands for electricity and water could deviate between the two SEIS alternatives, with the SEIS Preferred Alternative potentially having higher demands. The municipal water main supply to the project site would have sufficient transmission capability for the proposed expansion of the light industrial park. Likewise, the electric power transmission would be sufficient given that the electric power lines are scheduled for upgrades in 2021 . Water and electricity savings measurements would be used since they are a requirement for the planned LEED certification of the Lower portion of the project site. These savings would reduce the demand on the regional infrastructure.

Since the project site is presently not connected to the municipal sewer system, wastewater treatment must happen onsite. Under the SEIS Preferred Alternative, advanced onsite wastewater treatment would be implemented, while under the SEIS No-Action Alternative the wastewater system would not be as advanced and would remain mainly conventional septic system. The SEIS

Preferred Alternative would emit wastewater effluent with significantly lower residual pollutants, thus reducing adverse impacts to the aquatic resources.

Socio-economic: The beneficial socio-economic impacts from the Proposed Action would outweigh possible adverse impacts. The 2017 Koolau Poko Sustainable Communities Plan called for flat amounts of business development but acknowledged the importance of some limited light industrial developments near the Kapa'a Quarry. In addition, the availability of modern, sustainably designed, and operated small service businesses can allow older, less sustainable businesses to relocate and the land they move from can be used for higher level community needs. Finally, having local services near residents and helping locate businesses near the homes of employees has a positive impact on the community.

Cultural: Neither SEIS alternative would have any adverse effect on cultural assets, since no cultural or archeological sites are known at the project site. The land on which the proposed development would be built is a landfill area that was created approximately 60 years ago. In the unlikely event of an archeological find during construction, standard procedures would be followed to protect any assets.

Cumulative impacts and outstanding issue: The 2011 FEIS described that there were no other major projects planned in the vicinity of the site and therefore there should be no significant cumulative impacts. The 2011 FEIS described several outstanding issues, all of which have been addressed since the 2011 FEIS was approved, except the need for a renewed traffic study.

Impact mitigation through low impact development approach

Under both SEIS alternatives, the Lower portion of the site which is close to environmentally sensitive areas would be developed using an array of sustainable building and site preparation technologies. These technologies would follow site development standard of the LEED certification standard; therefore, the site development would be more environmentally friendly than typical light industrial developments. The use of sustainable building and infrastructure strategies would have a positive and significant effect on the efficacy of impact mitigation.

Project Funding

The development of the proposed Kapa'a Light Industrial Park project will be privately funded.

Relationship to Plans, Policies and Controls

The Proposed Action would be consistent with all applicable objectives and policies of the Honolulu City and County General Plan, and the Koolau Poko Sustainable Communities Plan.

Honolulu City and County Land Use Districts: The project site has two land use designations for the two land parcels which comprise the project site. The TMKs 4-2-15:013 and 014 are zoned Intensive Industrial (I-2) and Limited Industrial (I-1), respectively. These land zoning allows the use of the two parcels for the intended construction of warehouses.

State Land Use Districts: The entire project site is within the "Urban" district. The intended land use of proposed actions would therefore be consistent with the state "Urban" land use district.

Permits

The Proposed Action would require certain land use and building permits to carry out construction work including but not limited to building, grading, and work on public roads. In addition, all applicable NPDES permits would be required, all but one NPDES already obtained. The project work may possibly also need permits to perform work in streams (stream alteration permit). It must be determined if the Proposed Action would need permits by the U.S. Army Corp of Engineers or the State Department of Health for wetland and surface water related construction.

Remainder of this document

The remainder of this document clarifies the similarities and differences between the approved FEIS from 2011, the currently approved SMA and land use permits for the KLIP development (No-Action Alternative) and the more advanced water treatment systems and land use for the Lower site (Preferred Alternative). In addition, the progress on issues required after the FEIS (outstanding issues) is summarized.

Additional Information provided in this Final SEIS.

In response to the comments received on the Draft SEIS submittal, new technical information is presented in this FSEIS. The technical information presented in this FSEIS describes certain changes to the site development approach, design concepts, impact mitigation measures that need further description, and updated submittals to agencies about impact mitigation.

The technical information is presented in 12 appendices, including Appendix A which was already presented in the DSEIS. Eleven appendices are new. The 12 appendices are named as follows:

Appendix A was presented as in the Draft SEIS and remains part of the FSEIS.

Appendix B – Responses to comments received from agencies and public interest groups: Comments were received from the Accepting Agency, other agencies and several community action groups. For all comments which addressed topics described in the DSEIS, detailed responses were given.

Appendix C - Changes and additions made to the storm water treatment and management system: The Accepting Agency suggested changes to the DSEIS which required some design changes of the storm water system in the lower portion of the project site (Lower site). These changes and additions include adding one drainage area, adding one Manufactured Treatment Device (MTD), and increasing detention vault capacities.

Appendix D - Requirement to increase the finish grade treatment in lower portion of the site to install the storm water and management system: Appendix D describes the technical reasons to increase the finish grade in the lower portion of the site so that sufficient elevation is provided to convey storm water runoff from the site to the storm water system at the Northern site perimeter.

Appendix E – Preliminary storm water system operations and maintenance plan: Appendix E described the preliminary tasks and technologies required to maintain the post-construction storm water BMPs at the project site.

Appendix F – Off street parking and trees inside the project site: Appendix F describes the applicable ordinances about off-street parking and adding trees around warehouses. The appendix discusses how the updated County rules are being met, and proposes the planting of trees while avoiding significant storm water infiltration through the tree planting and landscaped areas.

Appendix G – Visual Impact Mitigation: Appendix G describes visual impact mitigation technologies and practices which will reduce the visual impact from the development, especially the lower portion of the project site. The effectiveness of the vegetation screen and the site perimeter is described. In addition, measures to lower visual impact from long-distance view are discussed.

Appendix H – Light pollution prevention measures: Appendix H presents an updated version of a 2016 submittal to the Accepting Agency and DLNR about site development concepts which mitigate light pollution from the project site. This 2016 submittal was accepted by the reviewing agencies. The appendix describes the light pollution mitigation technologies and practices planned for the development. These include shielded light fixtures, preferred types of light sources and avoiding light trespassing to adjacent land.

Appendix I – Buffer development approach: Appendix L describes development concepts for the vegetated buffer zone around the project site. The development approaches were delineated in a 2016 buffer development plan that was submitted to the Accepting Agency and DLNR. The plan was accepted by the reviewing agencies. With the same mitigation measures considered the 2016 plan was updated to reflect the changed layout pf the project site.

Appendix J – Drainage ditch along the Kapa'a Quarry Road: Appendix J describes the condition of the drainage ditch along the Kapa'a Quarry Road fronting the lower portion of the project site. The changing conditions of the drainage ditch are described over the past two decades, from a ditch with free water surface to ditch overgrown with dense vegetation. A proposed approach to modify the area containing the ditch is presented which includes clearing the now overgrown areas, installation of a new vegetated swale with drainage, and construction of a combined path for pedestrian and bicyclist use.

Appendix K – Status of site development work: Appendix K describes a status of the development efforts completed during the past five years and outstanding development efforts that were required under the conditional zone change awarded in 2013.

Appendix L – Relocation of power lines: Appendix L describes the relocation of 4 kV power line that supply the project site. The current alignment of the 4 kV power line passes through of the lower portion of the site. This alignment must be changed to install the power line poles outside the project site perimeter. Appendix L describe the proposed alignment options, and expected impacts to the environment and the community.

The responses to all comments addressed to the Applicant is presented in Appendix B of this FSEIS document. The list below shows the stakeholders and agencies who were contacted about the availability of the DSEIS document and were invited to submit comments.

No.	Agency / stakeholder	Contacted	Status Responses / comments
1	**Federal Agencies**		
1.1	U.S. Army Corps of Engineers	Notice of DSEIS. 11/23/2020	Did Not respond
1.2	U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office	Notice of DSEIS. 11/23/2020	Did Not respond
1.3	USDA NRCS, Pacific Islands Area State Office	Notice of DSEIS. 11/23/2020	Did Not respond
2	**State Agencies**		
2.1	**Department of Business, Economic Development and Tourism (DBEDT)**		
A	DBEDT, Strategic Industries Division	Notice of DSEIS. 11/23/2020	Did Not respond
B	DBEDT, Hawai'i State Energy Office	Notice of DSEIS. Sent 11/23	Did Not respond
2.2	**Department of Health (DoH)**		
A	Clean Water Branch	Notice of DSEIS. Sent 11/23	Did Not respond
B	DoH, Wastewater Branch	Notice of DSEIS. Sent 11/23	Did respond with comments
C	DoH, Safe Drinking Water Branch	Notice of DSEIS. Sent 11/23	Did Not respond
D	DoH, Clean Air Branch	Notice of DSEIS. Sent 11/23	Responded with Standard Comments for Land Use Reviews
2.3	**Department of Land and Natural Resources (DLNR)**		
A	DLNR, Commission on Water Resources Management	Notice of DSEIS. Sent 11/23	Did Not respond
B	DLNR, Division of Aquatic Resources	Notice of DSEIS. Sent 11/23	Did Not respond
C	DLNR, Division of Forestry and Wildlife	Notice of DSEIS. Sent 11/23	Did Not respond

No.	Agency / stakeholder	Contacted	Status Responses / comments
D	DLNR, Engineering Division	Notice of DSEIS. Sent 11/23	Did Not respond
E	DLNR, State Historic Preservation Division	Notice of DSEIS. Sent 11/23	Did Not respond
2.4	**Office of Hawaiian Affairs**	Notice of DSEIS. Sent 11/23	Did Not respond
2.5	**Office of Environmental Quality Control**		
2.6	Department of Transportation	Notice of DSEIS. Sent 11/23	Did Not respond
2.7	Water Resources Research Center / Environmental Center, University of Hawaii at Manoa	Notice of DSEIS. Sent 11/23	Did Not respond
3	**City and County of Honolulu Agencies**		
	DPP	Notice of DSEIS. Sent 11/23	Responded with comments
3.1	Honolulu Fire Department	Notice of DSEIS. Sent 11/23	Did Not respond
3.2	Honolulu Police Department	Notice of DSEIS. Sent 11/23	Did Not respond
3.3	Department of Environmental Services	Notice of DSEIS. Sent 11/23	Did Not respond
3.4	Department of Parks and Recreation	Notice of DSEIS. Sent 11/23	Did Not respond
3.5	Department of Planning and Permitting	Notice of DSEIS. Sent 11/23	Response came through Zachary Stoddard, POC of Accepting Agency
3.6	Department of Design and Construction	Notice of DSEIS. Sent 11/23	Responded with stating they have no comments
3.7	Board of Water Supply	Notice of DSEIS. Sent 11/23	Did not sent comments. Had responded to SEISPN
3.8	Department of Transportation Services	Notice of DSEIS. Sent 11/23	Responded on February 11, 2021 Sent Comments
3.9	Department of Facility Maintenance	Notice of DSEIS. Sent 11/23	Did Not respond
3.10	Office of Climate Change, Sustainability, and Resiliency	Notice of DSEIS. Sent 11/23	Did Not respond

No.	Agency / stakeholder	Contacted	Status Responses / comments
4	**Other**		
4.1	Senate District 24: Senator Jarrett Keohokalole	Notice of DSEIS. Sent 11/23	Did Not respond
4.2	House District 49: Rep. Scot Z. Matayoshi	Notice of DSEIS. Sent 11/23	Did Not respond
4.3	City Council Member: Alan Kekoa Texeira	Notice of DSEIS. Sent 11/23	Did Not respond
4.4	Oahu Metropolitan Planning Organization	Notice of DSEIS. Sent 11/23	Did Not respond
4.5	Hawaiian Telcom	Notice of DSEIS. Sent 11/23	Did Not respond
4.6	Hawaiian Electric Company	Notice of DSEIS. Sent 11/23	Did Not respond
4.7	Kailua Neighborhood Board No. 31	Notice of DSEIS. Sent 11/23	Responded with comments
4.8	Lani-Kailua Outdoor Circle	Notice of DSEIS. Sent 11/23	Responded with comments
4.9	Hawaii's Thousand Friends	Notice of DSEIS. Sent 11/23	Responded with comments
4.10	Dr. Charles Prentiss	Notice of DSEIS. Sent 11/23	Did Not respond
4.11	HAWAII AUDUBON SOCIETY		Sent comments

GLOSSARY OF ACRONYMS

2011 FEIS	**The previously approved FEIS for the Kapa'a Light Industrial Park; approved in 2011.**
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BWS	Board of Water Supply
CFR	Code of Federal Regulations
CY	Cubic Yard
CZM	Hawaii Coastal Zone management (CZW)
cbft/sec	Cubic Feet per Second
dBA	Decibel (A-weighted measurements)
L_{dn} dB	Decibel (Day-night average sound level)
DBEDT	Department of Business, Economic Development and Tourism, State of Hawaii
DEIS	Draft Environmental Impact Statement
DSEIS	Draft Supplemental Environmental Impact Statement
DoH	Department of Health, State of Hawaii
DoT	Hawai'i Department of Transportation, State of Hawaii
DPP	Department of Planning and Permitting, City and County of Honolulu
E_{T0}	Monthly evapotranspiration rate
E_{TL}	Project-specific rate Evapotranspiration Rate
EPA	U.S. Environmental Protection Agency
FAO	Food and Agriculture Organization of the UN
FEIS	Final Environmental Impact Statement
FIRM	Flood Insurance Rate Map
GIS	Geographical Information System
GPD	Gallons per Day
GPM	Gallons per Minute
HACCP	Hazard Analysis and Critical Control Point Plan

HAR	Hawaiʻi Administrative Rules
HECO	Hawaii Electric Company
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
HECO	Hawaiian Electric Company
HRS	Hawaiʻi Revised Statutes
KLIP	Kapa'a Light Industrial Park
K_L	Landscape coefficient
I-1	Limited Industrial Land Use Zone
I-2	Intensive Industrial Land Use Zone
LEED	Leadership in Energy and Environmental Design
LZ	Lighting Zone
LOS	Level of Service
LUC	Land Use Commission
Makai	in the direction the ocean (Hawaiian language expression)
Mauka	in the direction the mountain (Hawaiian language expression)
MG	Million Gallons
MGD	Million Gallons per Day
MPH	Miles per Hour
MR	Materials & Resources
MSL	Mean Sea Level
MSW	Municipal Solid Waste
MWh	Mega Watt Hours
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OEQC	Office of Environmental Quality Control

OMPO	Oahu Metropolitan Planning Organization
P-2	General Preservation Land Use Zone
PSI	Pounds per Square Inch
RP	Regional priority
SCP	Sustainable Communities Plan
SEIS	Supplemental Environmental Impact Statement
SEISPN	Supplemental Environmental Impact Statement Preparation Notice
SHPD	State Historic Preservation Division
SMA	Special Management Area
sqft	Square Feet
SS	Sustainable Sites
SWPPP	Storm water pollution prevention plan
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
Total	N Total Nitrogen
TSS	Total suspended solids
UBC	Uniform Building Code
USACoE	U.S. Army Corp of Engineers
USFWS	U.S. Fish and Wildlife Service
V/C	Volume to Capacity (ratio)
VOC	Volatile Organic Compounds
VPH	Vehicles per Hour
WE	Water Efficiency

"Lower site " is used to describe the lower portion of the project site on the lower portion of TMK 4-2-15:014.

"Upper site " is used to describe the upper portion of the project site, which includes land of TMK 4-2-15:013 and the upper portion of TMK 4-2-15:014.

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CHAPTER 1 - PURPOSE AND ORGANIZATION OF THE DRAFT SEIS

This ~~Draft~~ Final Supplemental Environmental Impact Statement (DSEIS) examines potential environmental impacts of developing the Kapa'a Light Industrial Park (KLIP) on a site that consists of two contiguous land parcels TMK (1) 4-2-15:013 and 014. The parcels are located on the windward side of Oahu, near the town of Kailua.

In the 2011 FEIS, the project site was described as consisting of three contiguous parcels TMKs 4-2-15:001 (portion of), 006 and 008. While the physical extent of the project site remains the same, the parcel TMK designations of the parcels making up the project site were changed. First, the parcel TMK 4-2-15:001 (portion of) was changed to 4-2-15:012. Subsequently, the TMKs 4-2-15:012 and 006 were consolidated as parcel TMK 4-2-15:014, and the parcel TMK 4-2-15:008 was reassigned TMK 4-2-15:013. The ownership off the parcels remained the same.
Another change in the site development approach was the administrative act of a Joint Development Agreement between the two owners of parcels TMK 4-2-15:013 and 014.

This FSEIS ~~DSEIS~~ follows up on a FEIS which was accepted in October 2011 (2011 FEIS), by the Accepting Agency, the City and County of Honolulu, Department of Planning and Permitting (DPP). The 2011 FEIS described the environmental impacts of the KLIP as they were delineated in 2011. In the nine years since the approval of the 2011 FEIS the project has gone through several stages of site design which included some changes in the approach of site development, technology, and construction as well as improved impact mitigations.

Based on these changes the DPP determined that a SEIS is required to determine the changes made to the site development, construction, and impact mitigation strategies.

This FSEIS ~~DSEIS~~ is prepared pursuant to Hawaii's environmental impact statement law (HRS 343) and Chapter 11-200.1 Hawaii Administrative Rules (HAR). The law requires that the government considers environmental, social, and economic consequences of developments, which are not exempt under the law. Developments for which an Environmental Assessment (EA) or Environmental Impact Statement (EIS) are prepared require adequate opportunities for the public to participate in the review process.

The following sections of Chapter 1 provide background, purpose, and need of the Proposed Action as well as describe the SEIS process for the Proposed Action and process steps that have been completed.

1.1 Project Background

The Applicant are the owner of two contiguous land parcels on which the Kapa'a Light Industrial Park (KLIP) is developed. With the KLIP site expansion ongoing, more of the project site area has been developed, and more warehouse buildings have been constructed since the 2011 FEIS.

The development of the KLIP started some 30 years ago when the applicant started to offer leasable base yard land and soon after built the first permanent warehouse structure. Currently, there are presently approximately 30 warehouses at the KLIP site, with building footprints ranging between 3,000

sqft to 24,000 sqft. The existing warehouses and those under active development are located within the Upper portion of the KLIP, within the TMK 4-2-15:013 and the Western portion of 4-2-15:014.

The development objective of the proposed KLIP is to provide the Kailua and Kaneohe region with additional industrial space, which is in short supply in this region. The Koolau Poko region, in which the proposed project is located, is significantly undersupplied with industrial space when compared to other markets on Oahu. Due to the shortage of industrial space, businesses that serve the region are often forced to locate within other regions on Oahu, resulting in long commutes and trip for employees and clients, which reside in the Koolau Poko region. Since there is virtually no other land within the Koolau Poko region to provide additional industrial space, the proposed site is an important asset for the region to improve the economic infrastructure.

1.1.1 Project Location

The Kapa'a Light Industrial Park (KLIP) is situated to the West of Kailua town, on the island of O'ahu. The KLIP stretches over 57 acres in the lower stretches of the Kapa'a Valley, which is the watershed of the Kapa'a Stream. The KLIP is located on two contiguous land parcels, TMK 4-2-15:013 and 14, with a total land area of 79 acres. The two parcels are owned by the Applicants, the King family, who are longtime residents of Kailua.

The project site is located on the windward side of the island of Oahu, at the western boundary next to the important Kawainui Marsh. The KLIP site is adjacent to Kapa'a Quarry Road and Kapa'a Quarry Place. (In the 2011 FEIS the referred to Kapa'a Quarry Access Road was recently renamed to Kapa'a Quarry Place). The H3-Freeway passes the project site to the north. The proposed project site and immediate surroundings are shown in Figure 1.1.1.

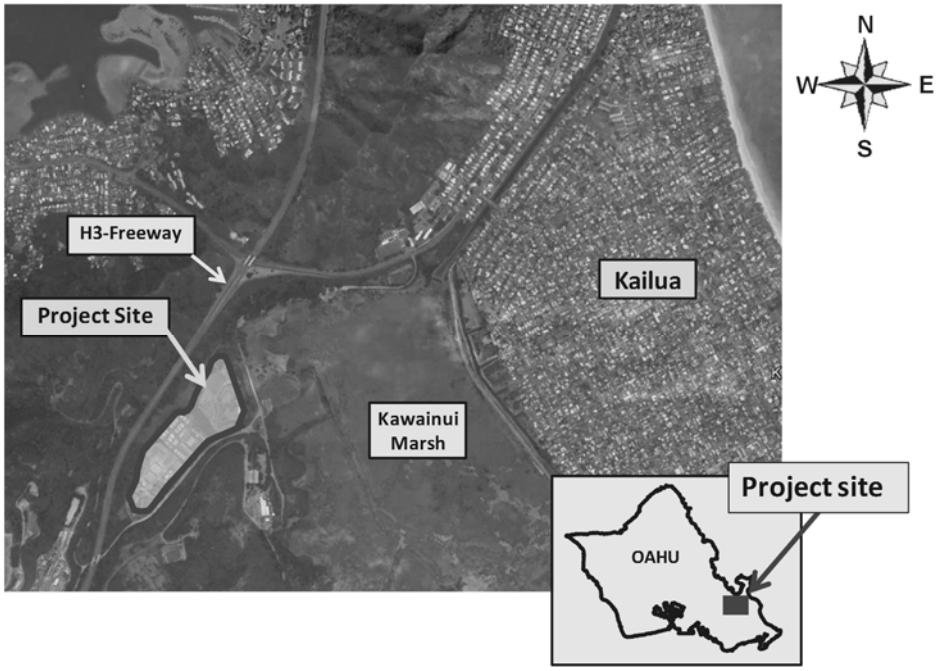


Figure 1.1.1: Project Location Map

1.1.2 Project Site Development Plans

The delineated development plans described in the 2011 FEIS were to add 606,000 square feet of warehouse space (building footprints) to the existing 283,000 square feet of warehouse space at the site. The total planned full build-out warehouse footprint, delineated in the 2011 FEIS, was therefore 889,000 sqft.

With 352,000 sqft of this warehouse space completed at the present time (2020) under the updated site development master plan, the planned additional warehouse footprint is 549,000 sqft to attain full build out. Therefore, the total full build-out warehouse footprint at the site is planned to be 892,000 sqft. This indicates that the presently planned full build-out warehouse footprint is only about 0.3% larger than disclosed in the 2011 FEIS. This means that the full build-out warehouse footprint described in the 2011 FEIS and updated in the present DSEIS is practically the same.

Likewise, the areas considered for the site development have slightly changed from the 2011 FEIS to the current site development master plan. The combined land area in the two parcels TMK -2-15:013 and 014 remains at 79 acres.

In the 2011 FEIS, the sum of the vegetated land and the impervious land at full build-out within the two parcels was itemized as 30.4 and 43.5 acres, respectively. An area of 5.1 acres was designated as "other, in parcel but outside project site". Under the current site development plans the sum of the vegetated land and the impervious land at full build-out is 31.0 and 44.9 acres, respectively, and 3.1 acres designated as "other". (refer to a detail description in Section 2)

A comparison between the planned full build-out area in the two parcels between the 2011 FEIS and the present SEIS indicates that under the updated masterplan, the planned impervious land increases by 3% and the land with vegetation increases by 2%. Therefore, this means that the changes in vegetated land and impervious land, including impervious pavement and building roofs, are small.

1.1.3 Administrative Actions for Site Development after 2011 FEIS

Following the acceptance of the 2011 FEIS there were the following changes in major land use permits:

A. <u>Conditional Zone change:</u> On October 24, 2013, the City and County approved a conditional zone change (Ordinance 13-35), which rezoned 27 acres of the former TMKs 4-2-15:012 and 006 parcels, the current consolidated parcel TMK 4-2-15:014, from General Preservation (P-2) to Limited Industrial (I-1). Figure 1.1.3.1 shows the "Exhibit A" map of the Ordinance 13-35. A portion of the project site is located inside the rezoned land.

The main conditions of Unilateral Agreement of the Zone Change Ordinance are as follows:

1. <u>Transportation:</u>
    a. The conditions included a project timeline with construction and traffic management plans.
    b. An updated Traffic Impact Analysis Report (TIAR) was required before construction of "Phase-D", defined as the Lower portion of the project site within parcel TMK 4-2-15:014.

c. An agreement with the City & County of Honolulu to build and fund frontage road improvements along the Kapa'a Quarry Road and Kapa'a Quarry Access Road (since renamed as Kapa'a Quarry Place).

Points A and C were ~~have been~~ completed and <u>are presently updated on cooperation with County agencies to reflect the changed site development plan</u>. Point B is outstanding and a new TIAR will be commissioned by the Applicants after the final development density is confirmed.

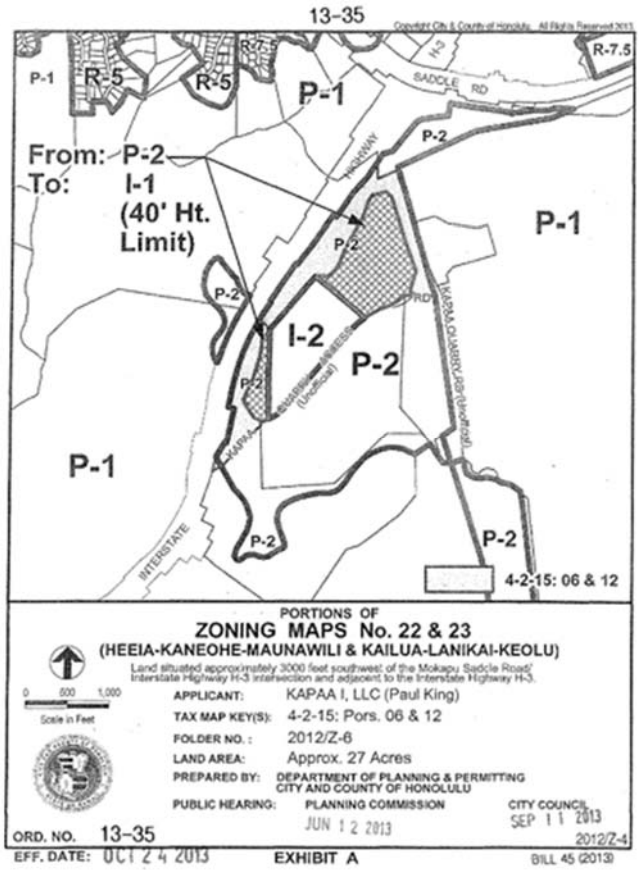


Figure 1.1.3.1:
Zoning Map of the Ordinance 13-35

The zoning map indicates the land that was rezoned from P-2 to I-1.

2. <u>Buffer zone:</u>

   a. A vegetated buffer zone was required around the project site to mitigate noise and visual impact. The buffer zone included earth berms and vegetation, including tall trees and shrubs.
   b. An existing detention basin within the buffer zone could be used for storm water treatment and flood control.

Point A has been completed since a Buffer Development Plan was developed by the Applicants and approved by the DPP in 2016. An updated version of the approved plan is presented in Appendix I. The existing detention basin mentioned under Point B is used for storm water treatment and flood control under the updated site development design.

3. Stormwater Facilities:

   a. Acceptance of off-site storm water drainage from an existing culvert under the Kapa'a Quarry Access Road (renamed as Kapa'a Quarry Place) onto the land.
   b. Development of the Lower portion of the parcel TMK 4-2-15:006 (the current 4-2-15:014) using low impact development (LID) approaches. These approaches include treating storm water runoff on site through underground storage containers while avoiding infiltration of rainwater into the existing landfill body.
   c. Monitoring and maintaining all onsite storm water infrastructure.

   All points A through C are being used in the site development planning and site design.

4. Exterior Lighting:

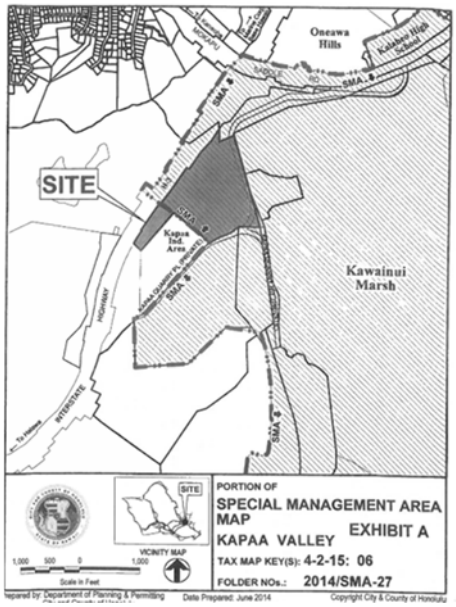
   a. Lighting impact mitigation was required to avoid impacts on migrating seabirds.

   A concept plan for the exterior lighting SDC (2016,A) was developed by the Applicants and approved by the Hawaii State Department of natural Resources (DLNR). An updated version of the approved plan is presented in Appendix H.

B. Special Management Area Use Permit (SMP) (Major): On September 25, 2014, the City and County of Honolulu granted a Special Management Are Use Permit (SMP) (Resolution 14-222, CD1) for the construction of portions of the Kapa'a Light Industrial park. Figure 1.1.3.2 shows the extent of the project site that is inside the Special Management Area (SMA). Figure 1.1.3.3 shows the project site configuration that was approved by the 2014 SMP.

C. Minor Modification for SMP No. 2014/SMA-27, 2016/MOD-68 (NA): In 2016 the DPP approved the SMP Minor Modification (2016/MOD-68 (NA) to allow grading and stockpiling in the Lower portion of the site. Stockpiling of a significant amount of fill was required to commence the first phase of grading. Since grading work was done in phases, fill that was brought to the site was first stored until sufficient fill was accumulated for the phased grading work to commence.

D. Minor Modification for SMP No. 2014/SMA-27, 2017/MOD-37 (MT): In 2017 the DPP approved the SMP Minor Modification (2017/MOD-37 (MT) to allow a redesigned storm water management system. The original storm water management system under the approved SMP No. 2014/SMA27 had an underground detention basin which would detain and subsequently release storm water in controlled above-ground discharges to receiving waters. The redesigned storm water system would replace the approved storm water system with a low impact development infiltration system.



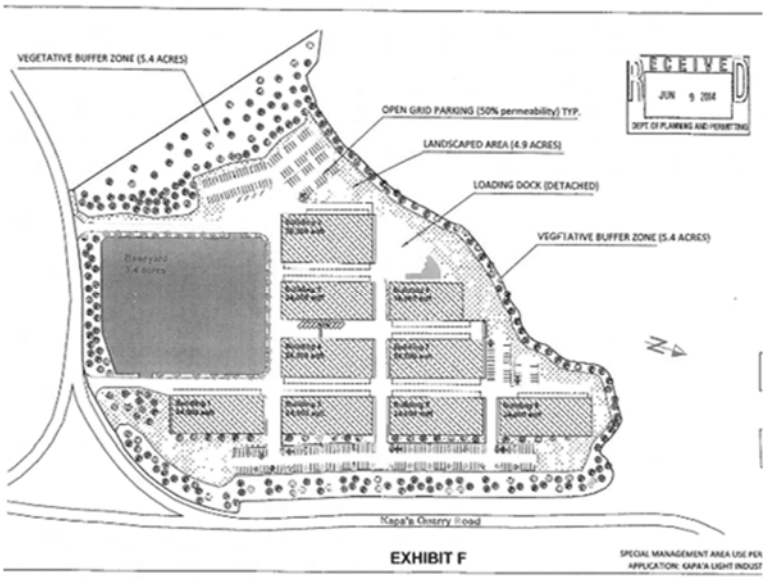


Figure 1.1.3.2: SMA Map (2014/SMA-27) Figure 1.1.3.3: SMP (2014/SMA-27) approved site configuration

Since the zone change did not permit infiltration of rainwater into the existing the landfill body, the revised storm water design under the 2017 SMP Minor Modification would infiltrate water into an added layer of fill adjacent and upstream of the perimeter berm. Under this method, the storm water would infiltrate into added and non-polluted fill. Subsequently, storm water would migrate below the site perimeter berms to the existing drainage swale along the Kapa'a Quarry Road.

E. Joint Development Agreement Conditional Use permit (CUP) No. 2015/CUP-70: In 2016 the DPP approved a joint development agreement for the Kapa'a light Industrial Park (KLIP). This allowed the joint development of the parcels that comprise the KLIP. Therefore, construction and operation of infrastructure and structures across property lines in the KLIP was allowed.

F. Subdivision of three parcels and creation of two lots; 2015/SUB-86: In 2016 the DPP approved a subdivision of the parcels that comprise the KLIP into two lots, Lot 1 of 22.3 acres and Lot 2 of 56.9 acres. The previous TMK 4-2-15:008 was designated Lot 1 and the two TMKs 42-155:006 and 012 were designated Lot 2. New TMK designations were subsequently assigned with TMK 4-2-15:008 changing to 4-2-15:013, and TMKs 4-2-15:006 and 012 changing to 4-2-15:14.

1.2 Purpose and Need for the SEIS

Earlier in 2020, the DOO required this SEIS following a February 2020 SMP Minor Modification Application that was denied, with the DPP letter dated April 8, 2020.

The February 2020 SMP Minor Modification proposed several changes in the site development design. The changes are described in more detail in Chapter 6 of this SEIS document. Among the proposed site development changes, the changed storm water management strategy was of the most concern.

The SMP Minor Modification Application requested the approval of a redesigned storm water management system, since further design work had concluded that the approved storm water system (under 2017/MOD-37 (MT) would cause construction and operational problems. A soil investigation study (Stewart Engineering, 2019) concluded that the intended infiltration of substantial amounts of water close to and upstream of to the site perimeter berms, and the subsequent migration of the infiltrated water through layers of added fill could cause soil stability problems of the earth berms. In addition, the drainage capacity of the ditch ~~swale~~ along the Kapa Quarry road and adjacent to the eastern site perimeter of the Lower portion of the site had deteriorated by significant soil accumulations and overgrowth with vegetation. In fact, the drainage ditch ~~swale~~ basically had ceased to exist in its function of conveying drainage to the Lower reaches of the Kapa'a Stream corridor.

Due to these design constraints, a revised storm water management system was designed that avoided infiltration of water into adjacent to the perimeter berm. The revised storm water management system proposed to collect the site runoff in below ground detention vaults for controlled above ground release through a single outfall to the Kapa'a Stream corridor. The single outfall was in the Lower reaches of the Kapa'a Stream corridor.

To provide sufficient hydraulic flow energy, e.g., hydraulic head, the 2020 SMP Minor Modification Application proposed to increase the finish grade. Increasing the finish grade also required to raise the site perimeter earth berms which stabilize the added fill.

In its denial decision, the DPP stated that a Supplemental EIS was required or warranted ".if modifications may have significant environmental impacts…. and ... when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts not previously dealt with." (quoting the April 8, 2020 DPP letter denying the SMP Minor Modification Application).

In due course, this FSEIS ~~DSEIS~~ is being created to address possible changes in environmental impact and the effectiveness of impact mitigation measures that are different from the 2011 FEIS.

The development objective of the proposed KLIP remains the same as delineated in the 2011 FEIS. The overreaching objective remains to provide the Kailua and Kaneohe region with additional industrial space, which is in short supply in this region.

The DPP Letter dated April 8, 2020 in which DPP declined the February 2020 SMP Minor Modification application, stated that submitted information was incomplete because the proposed modification requires an SEIS. The DPP letter is presented on the following three pages:

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

FILE

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

April 8, 2020

2020/MOD-11(ZS)
2014/SMA-27

Mr. Manfred Zapka
Sustainable Design & Consulting, LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

SUBJECT: Request for Minor Modification
Special Management Area (SMA) Use Permit
No. 2014/SMA-27
Kapaa Light Industrial Park
897 Kalanianaole Highway - Kailua
Tax Map Key 4-2-015: 014

This is in response to your submittal, received February 26, 2020, to modify the subject SMA. We regret to inform you that the submitted information is incomplete because the proposed modifications require a supplemental Environmental Impact Statement (EIS), as explained below.

You propose to modify the approved plans for the site because of design constraints that have arisen since the previous EIS, SMA (File No. 2014/SMA-27) and two subsequent Minor Modifications (File Nos. 2016/MOD-68 and 2017/MOD-37). The modifications proposed in the current application involve the stormwater management system, number of structures and building area, grading, perimeter berms, irrigation system, wastewater system, and roadway access (Pages 1 through 4 of the application). You state that the site has already been graded in accordance with approved plans, but there are no impervious surfaces or structures at this time (Page 9).

According to Hawaii Administrative Rules Chapter 11-200.1-30, a supplemental EIS is required if modifications may have significant environmental impacts. In addition, subsection (b) states, "A supplemental EIS shall be warranted ... when the mitigating measures originally planned will not be implemented, or where new circumstances or

Mr. Manfred Zapka
April 8, 2020
Page 2

evidence have brought to light different or likely increased environmental impacts not previously dealt with."

The proposed stormwater management system is significantly different compared to the stormwater management system described in the EIS. The proposed modifications involve significantly more impervious surface area, significantly less stormwater harvesting capacity and reuse, and a modified treatment system that eliminates infiltration. The proposed modifications no longer include large landscaped areas within the site that were described in the EIS. According to Page 184 of the EIS, pervious, vegetated areas manage a significant portion of stormwater through retention in the topsoil and evaporation. Because the proposed modifications involve less landscaped area to irrigate, the capacity to store and reuse stormwater has been reduced by about half (Page 3 of the modification request). The previously approved stormwater management system allowed stormwater to infiltrate under perimeter berms made of fill material designed to treat the stormwater (according to Minor Modification No. 2017/MOD-37, approved August 25, 2017). Stormwater would then migrate towards an existing ditch along Kapaa Quarry Road. A 2019 geotechnical report has since concluded that this would compromise the berm's stability. Instead, the proposed modifications direct stormwater through a manufactured treatment device and then directly into Kapaa Stream. It is unclear whether these modifications will cumulatively result in an increase in the volume of untreated overflow stormwater, which may have a significant environmental impact. In addition, the mitigating measures originally planned, including stormwater harvesting, pervious surfaces, and infiltration are significantly modified and will not be implemented as described in the EIS.

The proposed site design is also significantly different compared to the site design described in the EIS. The site design described in the EIS involves 15 buildings with a total building area of 337,000 square feet, while the proposed modification involves 14 buildings with a total building area of 373,200 square feet. Additionally, the finish grade must be raised to accommodate proposed changes to the stormwater management system. The previously approved finish grade ranges from 25 to 39 feet, while the proposed finish grade ranges from 40 to 50 feet (Page 42 of the application). The proposed finish grade is an average of 11.6 feet higher than what was previously approved, and will require 390,000 cubic yards of additional fill material. Page 325 of the EIS states a visual impact analysis shows that visual impacts can be mitigated. The proposed modifications significantly elevate the site features, which may result in a significant impact.

The proposed modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS. We will publish this determination in *The Environmental Notice*. The supplemental EIS should include, at minimum, the following:

Mr. Manfred Zapka
April 8, 2020
Page 3

- The percentage of annual stormwater that will overflow and bypass the proposed manufactured treatment device, as compared to the existing conditions and the approved plans under the EIS;
- The impact that treated and untreated stormwater will have on the stream and marsh, as compared to the existing conditions and the approved plans under the EIS;
- An analysis of alternatives, including the alternative of directing stormwater to the basin west of the Project site, and the impacts on water quality in the stream and marsh; and
- The visual impacts that the elevated site will have, as compared to the approved plans under the EIS.

The original application materials, including the $200 check, are enclosed. Should you have any questions, please contact Zack Stoddard, of our Land Use Approval Branch, at (808) 768-8019 or zachary.stoddard@honolulu.gov.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

Enclosure: Check No. 0415

1.3 The SEIS Process Steps of the Proposed Action

Under Hawaii's environmental impact review process, agencies are required to consider the impacts of their proposed major actions on the quality of the human and natural environment. The process is intended to make decisions on developments that are based on the understanding of impacts to the environment and community and identify and assess reasonable mitigation measures to avoid or minimize adverse effects.

The SEIS process is outlined in Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 343, Hawaii Revised Statutes (HRS) system of environmental review at the state and county levels. Hawaii Administrative Rule (HAR) Title 11, Chapter 200.1, Environmental Impact Statement Rules, with procedures and specifications regarding the contents, criteria, and definitions of applying the rules.

The procedures and requirements of creating a Supplemental EIS are stated in HAR §11-200.1-30 "Supplemental environmental impact statements". The applicable subsections of HAR §11-200.1-30 are listed below, with the underlined text highlighting has been added to indicate areas that relate to current project.

(a) An EIS that is accepted with respect to a particular action is usually qualified by the size, scope, location, intensity, use, and timing of the action, among other things. An EIS that is accepted with respect to a particular action shall satisfy the requirements of this chapter and no supplemental EIS for that Proposed Action shall be required, to the extent that the action has not changed substantively in size, scope, intensity, use, location, or timing, among other things. If there is any change in any of these characteristics which may have a significant effect, the original EIS that was changed shall no longer be valid because an essentially different action would be under consideration and a supplemental EIS shall be prepared and reviewed as provided by this chapter. If there is no change in a Proposed Action resulting in individual or cumulative impacts not originally disclosed, the EIS associated with that action shall be deemed to comply with this chapter.

(b*) The accepting authority or approving agency in coordination with the original accepting authority shall be responsible for determining whether a supplemental EIS is required. This determination will be submitted to the office for publication in the periodic bulletin. Proposing agencies or applicants shall prepare for public review supplemental EISs whenever the Proposed Action for which an EIS was accepted has been modified to the extent that new or different environmental impacts are anticipated. <u>A supplemental EIS shall be warranted when the scope of an action has been substantially increased, when the intensity 200.1-49 §11-200.1-31 of environmental impacts will be increased, when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts not previously dealt with.</u>*

(c) The <u>contents of the supplemental EIS shall be the same as required by this chapter for the EIS and may incorporate by reference unchanged material from the same</u>; however, in addition, <u>it shall fully document the proposed changes from the original EIS</u>, including changes in ambient conditions or available information that have a bearing on a Proposed Action or its impacts, <u>the positive and</u>

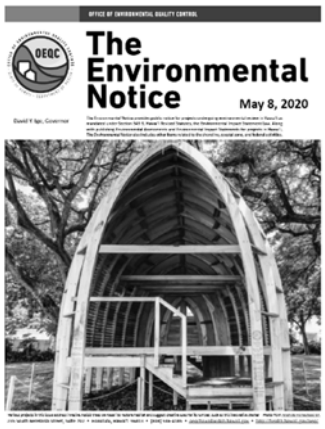
negative aspects of these changes, and shall comply with the content requirements of subchapter 10 as they relate to the changes.

(d) The requirements of the thirty-day consultation, public notice filing, distribution, the forty-five-day public review, comments and response, and acceptance procedures, shall be the same for the supplemental EIS as is prescribed by this chapter for an EIS.

1.4 SEIS Preparation Notice

The SEIS Preparation Notice was coordinated with DPP and was reported in the publication "The Environmental Notice" of the Office of Environmental Quality Control (OEQC).

The May 8, 2020 publication of the OEQC "The Environmental Notice" informed about the DPP decision of requiring a SEIS for the project. Figure 1.4.1 shows the cover sheet of the May 8, 2020 of the OEQC "The Environmental Notice" and the section that describes the DPP determination of requiring a SEIS.



May 8, 2020 — The Environmental Notice

O'AHU (CONTINUED)

Kapa'a Light Industrial Park--(Determination that Supplemental EIS is required)

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation	MAP UNAVAILABLE
District(s)	Ko'olaupoko	
TMK(s)	(1) 4-2-015:014	
Permit(s)	Numerous	
Approving Agency/ Accepting Authority	Department of Planning and Permitting, City and County of Honolulu Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov 650 South King Street, Honolulu, HI 96813	
Applicant	Kapaa I, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 Paul King, (808) 261-8991, sustainableDC@gmail.com	
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com	
Status	The approving agency has determined that a supplemental EIS is required.	

The proposed industrial park would be adjacent to the Kapa'a Stream and mauka of the Kawainui Marsh. Only grading work has been completed so far.

The Final EIS for the project was accepted on 10/11/2011. Since then, the Department of Planning and Permitting approved a major Special Management Area permit (file number 2014/SMA-27) and two minor modifications to that permit (file numbers 2016/MOD-68 and 2017/MOD-37). The applicant is requesting to modify the Special Management Area permit a third time because design constraints have arisen.

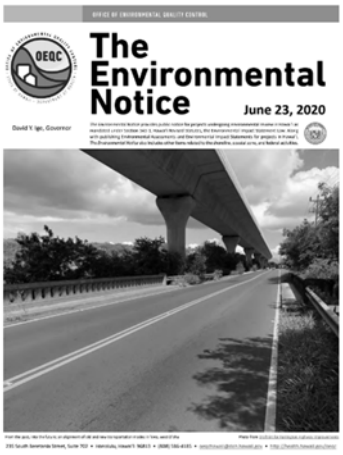
The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. As explained in the determination letter, the modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(a) Cover of the May 8, 2020 edition of the OEQC "The Environmental Notice"

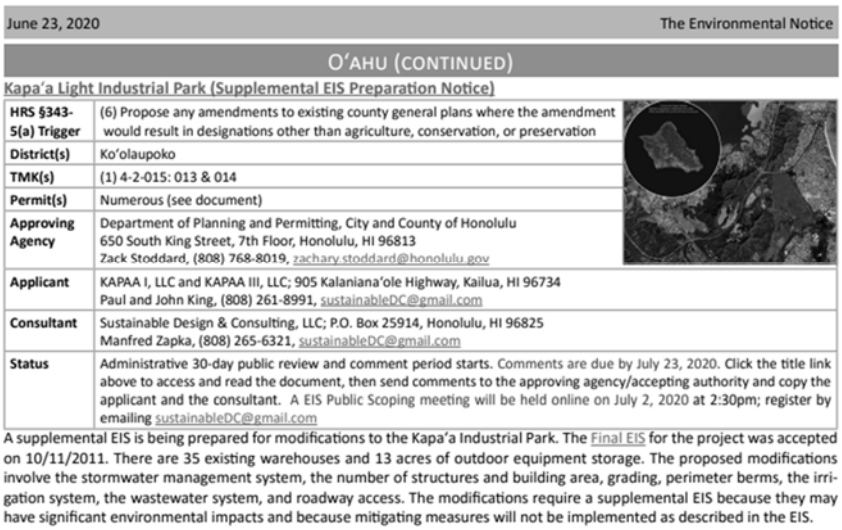
(b) Information of DPP determination requiring a SEIS for the Kapa'a Light Industrial Park

Figure 1.4.1: May 8, 2020 Publication in The Environmental Notice

The June 23, 2020 publication of the OEQC "The Environmental Notice" provided information on the SEIS Preparation Notice (SEISPN) and the public scoping meeting and provided a link to download the SEISPN document. Figure 1.4.2 shows the cover sheet of the June 23, 2020 of the OEQC "The Environmental Notice" and the information presented on the SEISPN.



(a) Cover of the June 23, 2020 edition of the OEQC "The Environmental Notice"



June 23, 2020 The Environmental Notice

O'AHU (CONTINUED)

Kapa'a Light Industrial Park (Supplemental EIS Preparation Notice)

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-015: 013 & 014
Permit(s)	Numerous (see document)
Approving Agency	Department of Planning and Permitting, City and County of Honolulu 650 South King Street, 7th Floor, Honolulu, HI 96813 Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov
Applicant	KAPAA I, LLC and KAPAA III, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 Paul and John King, (808) 261-8991, sustainableDC@gmail.com
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com
Status	Administrative 30-day public review and comment period starts. Comments are due by July 23, 2020. Click the title link above to access and read the document, then send comments to the approving agency/accepting authority and copy the applicant and the consultant. A EIS Public Scoping meeting will be held online on July 2, 2020 at 2:30pm; register by emailing sustainableDC@gmail.com

A supplemental EIS is being prepared for modifications to the Kapa'a Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(b) Information of DPP determination requiring a SEIS for the Kapa'a Light Industrial Park

Figure 1.4.1: June 23, 2020 Publication in The Environmental Notice

1.5 SEIS Scoping Process

Upon acceptance of the SEISPN the project team began the environmental review process with conducting the scoping process. A public scoping meeting was conducted on July 6, 2020. The scoping meeting was held online.

A scoping report was written that describes in detail the process and outcome of the scoping process. The scoping report is presented in Appendix A along with presentations that were used in meeting supporting SEIS scoping.

A summary of the process and outcome of the scoping process is presented hereafter:

The scoping process for the Draft EIS was conducted over a period of two months; from July to August 2020. The scoping process included the following communications and interactions:

A. Communication with the DPP, the Accepting Agency
B. Holding one public scoping meeting (held online)
C. Communicating with State and County agencies
D. Communicating with community groups
E. Communicating with individuals
F. Presenting the proposed scope of the SEIS at a public meeting of the Kailua Neighborhood Board.

DPP scope requirements: The DPP stated the following issues to be discussed in the SEIS, since they differ from the approaches described in the 2011 FEIS:

Stormwater Management System: The following issues related to storm water management should be discussed in the SEIS:

- More impervious surface area: The impacts and implications of less landscaped and pervious areas within the site relative to the 2011 FEIS should be discussed in conjunction with the revised storm water management strategy. The site will have more paved and impervious traffic areas adjacent to the warehouse structures.
- Less stormwater harvesting capacity; The impacts implications of having less landscaped area should be discussed relative to the needs for irrigation water. Less area to irrigate would decrease the capacity to store and reuse stormwater.
- Modified storm water management system that eliminates infiltration; The previously approved stormwater management system included stormwater to be detained in underground vaults and subsequently infiltrated into soil that was added inside and adjacent the perimeter berm (according to Minor SMP Modification No. 2017/MOD-37, approved August 25, 2017). Based on a soil study, it was found that infiltrating significant amounts of rainwater upstream of the site perimeter berms and possible below ground water migration underneath the perimeter berms could cause stability problems of the site perimeter berms.
  Therefore, an alternative storm water management strategy has been developed to discharge the runoff to the Kapa'a Stream corridor via the Northern site perimeter. The impact and implications of the new storm water management strategy should be discussed in this SEIS.
- Volume of untreated overflow stormwater; DPP stated the need to investigate impact and implications of discharging storm water that bypassed the proposed water quality treatment system during peak storm events. This discharge would cause an increase in the volume of untreated overflow stormwater, which might cause environmental impact.

Site development: The following issues related to the site development strategies should be discussed.

- Change in number of buildings and total building area; With the number and locations of warehouse buildings changing in the updated site development approach relative to the 2011 FEIS related impacts and implications should be discussed.

- Increased finish grade elevation: Impacts and implications of raising the full build-out finish grade elevation should be discussed. While increasing the finish grade elevation is necessary to install the proposed storm water management system with low impact development strategies, raising the finish grade elevations could have impact and implications on the environment and the community.

- Visual impact due to increased elevation of finish grade; One potential impact of raising the finish grade would be the visual impact caused by higher perimeter berms. Therefore, a visual impact analysis should indicate if the visual impacts can be successfully mitigated.

The DPP concludes that the Supplemental EIS should include, at minimum, the following:

- The percentage of annual stormwater that will overflow and bypass the proposed manufactured treatment device, as compared to the existing conditions and the approved plans under the EIS.
- The impact that treated and untreated stormwater will have on the stream and marsh, as compared to the existing conditions and the approved plans under the EIS.
- An analysis of alternatives, including the alternative of directing stormwater to the basin west of the Project site, and the impacts on water quality in the stream and marsh; and
- The visual impacts that the elevated site will have, as compared to the approved plans under the EIS.

Comments and input received in the scoping process were from governmental agencies, community groups and individuals. Figure 1.5.1 and Table 1.5.1 show the range of issues of concern received in the scoping process. A high frequency of specific issues raised indicated a high level of perceived importance to address related impacts and implications.

As Figure 1.5.1 indicates, the leading concerns and recommendation received during the scoping were storm water and site development related, with 35% and 23% of the sum of received input, respectively. Water supply/non-potable water related issues and onsite wastewater treatment were two other topics raised.

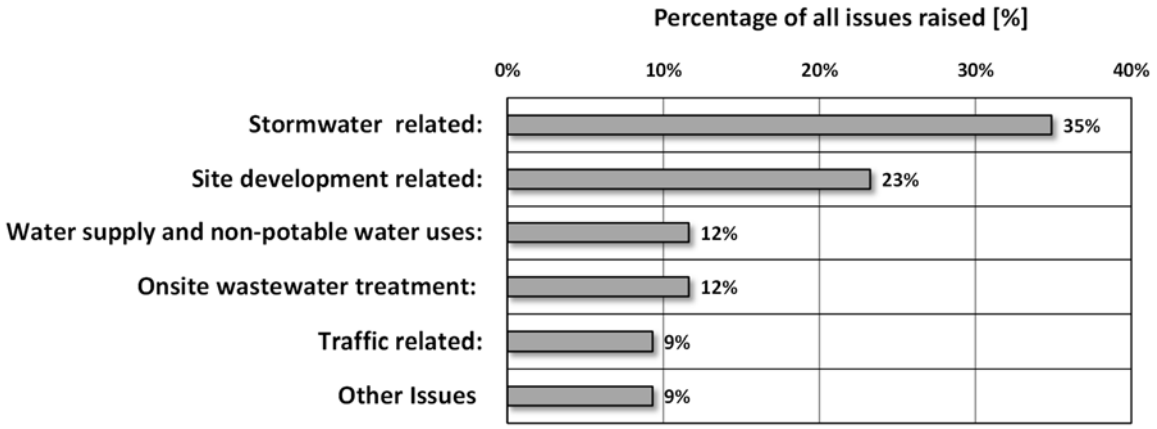


Figure 1.5.1: Frequency diagram of issues and concerns

1.6 Referencing Issues that Have not Changed from the 2011 FEIS

A significant number of issues discussed in the 2011 FEIS have not changed or have negligible changes. In these cases, the DSEIS references applicable Sections of the 2011 FEIS and provides an overview. In the DSEIS, the team indicates if changes from the conditions disclosed in the 2011 FEIS have occurred and if these changes are either small and negligible or warrant a deeper discussion of the impacts and implications of these changes.

Table 1.5.1: Summary and compilation of issues received during the scoping process

No.	Issues raised	DPP Determination (Accepting Agency)	County and State Agencies	During Public Scoping meeting	Community groups
A	**Stormwater water related:**	**X**		**X**	
A.1	More impervious surface area	**X**		**X**	**X**
A.2	Less storm water harvesting	**X**			
A.3	Modified treatment system without infiltration; using MTD	**X**			**X**
A.4	Volume of untrated water	**X**			
A.5	Stormwater overflowing and bypassing the MTD	**X**			
A.6	Impact that treated and untreated stormwater will have on the stream and marsh	**X**			
A.7	Alternative stormwater solution that directs runoff to existing sedimentation basin	**X**			
A.8	Possible flooding of Kapa'a Quarry road				**X**
A.9	Maintaining the stormwater treatment systems				**X**
B	**Site development related:**				
B.1	Change in number of buildings and total building area	**X**			**X**
B.2	Increased finish grade	**X**			**X**
B.3	Visual impact	**X**			**X**
B.4	Project boundaries				**X**
B.5	Current use of the site				**X**
B.6	Effect on wildlife	**X**			**X**
C	**Water supply and nonpotable water uses**				
C.1	Non-potable water for irrigation		**X**		
C.2	Rainwater catchment for irrigation	**X**	**X**		**X**
C.3	Use of low flow fixtures and toilets		**X**		
D	**Onsite waste water treatment:**			**X**	**X**
D.1	Impact of septic system				**X**
D.2	onsite treament versus municipal sewer				**X**
E	**Traffic:**				
E.1	Updated Traffic Impact Analysis Report		**X**		**X**
E.2	External road improvements		**X**		
E.3	Traffic safety				**X**
F	**Other:**				
F.1	Noise and light pollution				**X**
F.2	Market needs for project				**X**
F.3	Inclusion of "No-Build" alternative				**X**
F.4	Clean air concerns		**X**		

1.7 Changes of Site Development Approaches from 2011 FEIS

While the overall development objectives for the KLIP have not changed, certain development strategies have been changed from the 2011 FEIS.

The subject changes in site development can be grouped into three categories:

A. Changed site development strategies that a related to the operation and use of the KLIP.
B. Changed site development strategies that use of new and more effective impact mitigation technologies.
C. Changed site development strategies that are required by evolving governmental requirements.

Table 1.7.1 shows a summary of major differences of site development strategies between the accepted 2011 Final EIS and the proposed site development masterplan presented in this SEIS, grouped into the categories A, B and C.

Table 1.7.1: Summary of major changes of site development strategies between the accepted 2011 FEIS and proposed action

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
A. Changed site development strategies that a related to the operation and use of the KLIP.		
A.1	Changed site layout affecting buildings and traffic areas in the project site	Improve internal movement, align to traffic flow, and maximize development density.
A.2	Changed site road access: use only one road access	Reduce traffic risks and create simpler traffic flow on adjacent roadways
A.3	Strom water harvesting for irrigation;	Less interior vegetated area to irrigate and adding irrigation of the site perimeter berms.
A.4	Irrigation; changed irrigation needs	Less interior vegetated area to irrigate and adding irrigation of the site perimeter berms.
A.5	Pervious and vegetated areas; reduced	Avoid infiltration of rainwater into the landfill body
B. Changed site development strategies that use of new and more effective impact mitigation technologies.		

Table 1.7.1: Summary of major changes of site development strategies between the accepted 2011 FEIS and proposed action

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
B.1	Wastewater treatment technology; advanced technology	Efforts to Lower wastewater related impacts through more effective onsite wastewater treatment technologies
C. Changed site development strategies that follow new governmental requirements.		
C.1	Storm water drainage and treatment technology; better pollution control	More stringent storm water permit guidelines design constraints
C.2	Site finish grade elevation; increased site elevation in the Lower portion of the site	Connected to the storm water management systems and required for storm water conveyance to treatment and discharge.
C.3	Site perimeter berms; increased to accommodate increased site grade in the Lower portion of the site.	Connected to the storm water management systems and required to stabilize the increased finish grade at full build-out

Category A Changes in site development strategies that related to the operation and use of the KLIP:

Change A.1 relates to the changes in the site layout, specifically the distribution of buildings and traffic areas. The Applicants decided to allocate more building footprint to the Lower portion of the site than was delineated in the 2011 FEIS. As the amount of building footprint differs less than 1 percent between the 2011 FEIS and the updated site development plan, less building footprint is allocated to the Upper portion of the site.

Change A.2 relates to a new approach of a site access. The new configuration of the roadway access was determined by the Applicants to simplify the traffic patterns and reduce traffic risks due to sight distance problems.

Change A.3 relates to collecting rainwater on designated building roofs for harvesting and subsequent use for irrigation of vegetated areas in the project site and at the site perimeter. With the layout of buildings and the location and extent of vegetated areas changed, the method of rainwater harvesting will change.

Change A.4 is closely related to Change A.3 as it identifies the changed need for irrigation water due to changes in the irrigation approach.

Change A.5 is indirectly related to Changes A.3 and A.4. The Applicants decided to remove larger vegetated areas inside the project from the current site development plan. This caused smaller vegetated areas in the site interior and therefore less need for irrigation water of these interior areas. The need for harvested rainwater increased due to irrigation of the perimeter berms.

Category B - Changed site development strategies that use of new and more effective impact mitigation technologies:

Change B.1 Wastewater treatment technology. The Applicants proposed to use an advanced wastewater treatment technology. This change in technology was made to align the development of the KLIP with innovative environmental technologies, which offer a more effective impact mitigation capacity. This change in onsite wastewater treatment technology was done voluntarily by the applicants and was not dictated by governmental regulations.

Category C - Changed site development strategies that are required by evolving governmental requirements.

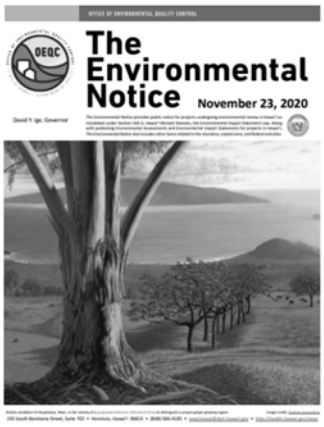
Change C.1 relates to evolving governmental requirements about storm water treatment and management. The standard for storm water treatment and management have been significantly upgraded in 2018. Standards which were in effect at the time the 2011 FEIS was approved are no longer sufficient under changed governmental regulations. Instead, storm water treatment and management strategies will be considered under the updated development masterplan which not only abide by the rules, but which would go beyond and provide enhanced impact mitigation.

Change C.2 is a site development consequence of Change C.1. Design detail, that will be described later in this DSEIS, delineate that the full build-out finish grade elevation must be significantly elevated from earlier plans, to provide the hydraulic flow energy to convey storm water runoff through the subsequent stages of the proposed storm water treatment and management system.

Change C.3 is a logical change as it related to the need of increasing and widening the site perimeter earth berms. The berms are needed to stabilize the added fill to achieve the higher elevation of the full build-out site.

1.8 Publication of the Draft SEIS (New Section)

The Draft SEIS (DSEIS) was published in the November 23, 2020 edition of the "The Environmental Notice" of the Office of Environmental Quality Control (OEQC). Figure 1.8.1 shows the cover of the November 23 edition and the notice of the availability of the DSEIS document.

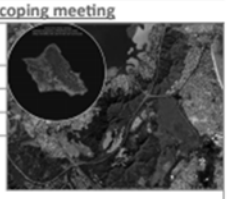


November 23, 2020 The Environmental Notice

O'AHU

Kapaa Light Industrial Park--Draft Supplemental EIS and audio recording of public scoping meeting

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-015:013 & 014
Permit(s)	Zone change and numerous others (see document)
Approving Agency/ Accepting Authority	Department of Planning and Permitting, City and County of Honolulu Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov 650 South King Street, Honolulu, HI 96822
Applicant	KAPAA I, LLC and KAPAA III, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 John and Paul King, c/o (808) 265-6321, sustainableDC@gmail.com
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com
Status	Statutory 45-day public review and comment period starts. Comments are due by January 7, 2021. Click the title links above to read the doument and hear the audio recording of the public scoping meeting, then send comments to the approving agency/accepting authority at sustainableDC@gmail.com



A Supplemental EIS is being prepared for modifications to the Kapaa Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(a) Cover of the November 23, 2020 edition of the OEQC "The Environmental Notice"

(b) Information how to access and download the DSEIS and the audio recording of the public scoping meeting.

Figure 1.8.1: November 23, 2020 Publication in The Environmental Notice

1.9 Stakeholders/agencies who Commented on the DSEIS (New Section)

Table 1.9.1 shows the stakeholders / agencies which were consulted and either commented or did not comment on the Draft SEIS (DSEIS). The responses to all comments addressed to the Applicant are presented in Appendix B of this FSES document.

Table 1.9.1: List of stakeholders which were contacted and advised of the availability of the DSEIS and/or which sent comments (the responses to the comments addressed to the Applicant are presented in Appendix B)

No.	Agency / stakeholder	Point of contact	Contacted	Status Responses / comments
1	**Federal Agencies**			
1.1	U.S. Army Corps of Engineers	**To: U.S. Army Corps of Engineers, Honolulu District** Fort Shafter, HI 96858-5440 Sent via email to: CEPOH-PA@usace.army.mil To Whom It May Concern:	Notice of DSEIS. Via email 11/23/2020	Did Not respond
1.2	U.S. Fish and Wildlife Service, Pacific	To: **Pacific Islands Fish and Wildlife Office**	Notice of DSEIS.	Did Not respond

	Islands Fish and Wildlife Office	**U.S. Fish and Wildlife Service** 300 Ala Moana Blvd Rm 3-122 Honolulu, HI 96850 Sent via email to: pifwo_admin@fws.gov	Via email 11/23/2020	
1.3	USDA NRCS, Pacific Islands Area State Office	To: Attn.: Mr. Travis Thomason, Director **USDA Natural Resources Conservation Service (NRCS)** **Pacific Islands Area State Office** P.O. Box 50004 Honolulu, Hawaii 96850-0050 Sent via email to: Travis.Thomason@usda.gov	Notice of DSEIS. Via email 11/23/2020	Did Not respond
2	**State Agencies**			
2.1	**Department of Business, Economic Development and Tourism (DBEDT)**			
A	DBEDT, Strategic Industries Division	Attn.: Mr. Mike McCartney **Dept. of Business, Economic Development & Tourism** **Director's Office** 250 S. Hotel Street, 5th Floor Honolulu, HI 96813 808-586-2355 Sent via email to: dbedt.director@hawaii.gov	Notice of DSEIS. Via email 11/23/2020	Did Not respond
B	DBEDT, Hawai'i State Energy Office	Attn.: Scott J. Glenn, Chief Energy Officer **Hawaii State Energy Office** P.O. Box 2359 Honolulu, Hawaii 96804 Phone: (808) 587-3807 Sent via email to: dbedt.energyoffice@hawaii.gov	Sent 11/23	Did Not respond
2.2	**Department of Health (DoH)**			

A	Clean Water Branch	Attn.: Mr. Alec Wong, P.E., Chief **State of Hawaii Department of Health** **Clean Water Branch** 2827 Waimano Home Rd #225 Pearl City, HI 96782 Sent via email to: CleanWaterBranch@doh.hawaii.gov	Sent 11/23	Did Not respond
B	DoH, Wastewater Branch	Attn.: Mrs. Sina Pruder, P.E. , Chief **State of Hawaii Department of Health** **Wastewater Branch** 2827 Waimano Home Road Hale Ola Building, Room 207 Pearl City, HI 96782-1487 Sent via email to: sina.pruder@doh.hawaii.gov	Sent 11/23	Did respond with comments
C	DoH, Safe Drinking Water Branch	Attn.: Mrs. Joanna Seto, P.E., Chief State of Hawaii Department of Health Safe Drinking Water Branch 2385 Waimano Home Road Uluakupu Building 4, Suite 110 Pearl City, HI 96782-1400 Sent via email to: sdwb@doh.hawaii.gov	Sent 11/23	Did Not respond
D	DoH, Clean Air Branch	Clean Air Branch Hawaii State Department of Health Sent via email to: cab@doh.hawaii.gov		Responded with Standard Comments for Land Use Reviews
2.3	**Department of Land and Natural Resources (DLNR)**			
A	DLNR, Commission on Water Resources Management	Attn.: Suzanne D. Case, Chairperson **DLNR, Commission on Water Resource Management** P.O. Box 621 Honolulu, Hawaii 96809	Sent 11/23	Did Not respond

		Sent via email to: dlnr.cwrm@hawaii.gov		
B	DLNR, Division of Aquatic Resources	Attn.: Brian Neilson, Administrator DLNR, Division of Aquatic Resources 1151 Punchbowl Street, Room 330 Honolulu HI 96813 Sent via email to: DLNR.aquatics@hawaii.gov	Sent 11/23	Did Not respond
C	DLNR, Division of Forestry and Wildlife	Attn.: David Smith, Administrator DLNR, Division of Forestry and Wildlife Kalanimoku Building 1151 Punchbowl St. Room 325 Honolulu, HI 96813 Sent via email to: dlnr@hawaii.gov	Sent 11/23	Did Not respond
D	DLNR, Engineering Division	Attn.: Carty Chang, P.E., Chief Engineer **DLNR, Engineering Division** Kalanimoku Building 1151 Punchbowl Street, Room 221 Honolulu, Hawaii 96813 Sent via email to: dlnr.engr@hawaii.gov	Sent 11/23	Did Not respond
E	DLNR, State Historic Preservation Division	Attn.: Alan Downer, Administrator **DLNR, State Historic Preservation Division** Kakuhihewa Building 601 Kamokila Blvd., Suite 555 Kapolei, HI 96707 Sent via email to: dlnr@hawaii.gov	Sent 11/23	Did Not respond
2.4	**Office of Hawaiian Affairs**	Attn.: Lisa Watkins-Victorino, Ph.D., COO Office of Hawaiian Affairs 560 N. Nimitz Hwy., Suite 200 Honolulu, HI 96817 Sent via email to: info@oha.org	Sent 11/23	Did Not respond

2.5	**Office of Environmental Quality Control**			
2.6	Department of Transportation	Attn.: Jade Butay, Director **Department of Transportation** Aliiaimoku Building, Room 509 869 Punchbowl Street Honolulu, HI 96813 Sent via email to: Grace S. Ichikawa, Executive Aide to the Director Sent via email to: Grace.Ichikawa@hawaii.gov	Sent 11/23	Did Not respond
2.7	Water Resources Research Center / Environmental Center, University of Hawaii at Manoa	Attn.: Prof. Thomas W. Giambelluca, Director Water Resources Research Center University of Hawaii at Manoa 2540 Dole St., Holmes Hall 283 Honolulu, HI 96822 Sent via email to: thomas@hawaii.edu	Sent 11/23	Did Not respond
3	**City and County of Honolulu Agencies**			
	DPP	Attn.: Zachary Stoddard City & County of Honolulu, Department of Planning and Permitting Land Use Branch 650 S King St Honolulu, HI 96813 Sent via email to Zachary.Stoddard@honolulu.gov	Sent 11/23	Responded with comments
3.1	Honolulu Fire Department	Attn.: Manuel P. Neves, Fire Chief Honolulu Fire Department 636 South Street Honolulu, Hawaii 96813 Sent via email to: c.naval@honolulu.gov	Sent 11/23	Did Not respond

3.2	Honolulu Police Department	Attn.: Susan Ballard, Chief of Police Police Department, City and County of Honolulu 801 South Beretania Street, Honolulu, Hawaii 96813 Sent via email to: Captain Brian Lynch blynch@honolulu.gov Emily Ogasawara, eogasawara@honolulu.gov	Sent 11/23	Did Not respond
3.3	Department of Environmental Services	Attn.: Lori M. K. Kahikina, P.E., Director City and County of Honolulu Department of Environmental Services 1000 Uluohia Street, Suite 308 Kapolei, Hawaii 96707 Sent via email to: Lisa Kimura, lkimura1@honolulu.gov	Sent 11/23	Did Not respond
3.4	Department of Parks and Recreation	Attn.: Michele K. Nekota, Director City and County of Honolulu Department of Parks and Recreation 1000 Ulu'ōhi'a Street, Suite 309 Kapolei, Hawai'i 96707 Sent via email to: parks@honolulu.gov	Sent 11/23	Did Not respond
3.5	Department of Planning and Permitting	**City and County of Honolulu, Department of Planning & Permitting** 650 So. King St., Honolulu, HI 96813 • Fax: (808) 768-6743 Sent via email to: Kathy Sokugawa, Acting director Sent through Zachary Stoddard	Sent 11/23	Response came through Zachary Stoddard, POC of Accepting Agency
3.6	Department of Design and Construction	Attn.: Haku Milles, P.E., Deputy Director City and County of Honolulu	Sent 11/23	Responded with stating they have no comments

		Department of Design and Construction 650 South King Street, 11th Floor Honolulu, Hawaii 96813 Sent via email to: ddc@honolulu.gov		
3.7	Board of Water Supply	Attn.: Ernest Y. W. Lau, P.E., Manager and Chief Engineer Honolulu Board of Water Supply 630 South Beretania Street Honolulu, Hawaii 96843 Sent via email to: elau@hbws.org	Sent 11/23	Did not sent comments. Had responded to SEISPN
3.8	Department of Transportation Services	Attn.: Christopher Clark, Chief Planner City and County of Honolulu Department of Transportation Services 650 South King Street, Third Floor Honolulu, Hawai'i 96813-3017 Sent via email to: c.Clark@honolulu.gov	Sent 11/23	Responded on February 11, 2021 Sent Comments
3.9	Department of Facility Maintenance	Attn.: Ross S. Sasamura, P.E., Director and Chief Engineer City and County of Honolulu Department of Facility Maintenance 1000 Uluohia Street, Suite 215 Kapolei, Hawaii 96707 Sent via email to: r.sasamura@honolulu.gov	Sent 11/23	Did Not respond
3.10	Office of Climate Change, Sustainability, and Resiliency	Attn.: Joshua W. Stanbro, Chief Resilience Officer & Executive Director Office of Climate Change, Sustainability, and Resiliency Kapālama Hale 925 Dillingham Boulevard, Suite 257 Honolulu, Hawai'i 96817 Sent via email to: resilientoahu@honolulu.gov	Sent 11/23	Did Not respond

4	**Other**			
4.1	Senate District 24: Senator Jarrett Keohokalole	Senator Jarrett Keohokalole Senate District 24 Hawaii State Capitol, Room 203 415 S Beretania St # 219, Honolulu, HI 96813 Sent via email to: senkeohokalole@capitol.hawaii.gov	Sent 11/23	Did Not respond
4.2	House District 49: Rep. Scot Z. Matayoshi	Representative Scot Z. Matayoshi House District 49 Hawaii State Capitol, Room 331 415 S Beretania St # 219, Honolulu, HI 96813 Sent via email to: repmatayoshi@Capitol.hawaii.gov	Sent 11/23	Did Not respond
4.3	City Council Member: Alan Kekoa Texeira	Councilmember Alan Kekoa Texeira City and County of Honolulu, City Council Honolulu Hale 530 South King Street, Room 100 Honolulu, Hawaii 96813 Sent via email to: alan.texeira@honolulu.gov	Sent 11/23	Did Not respond
4.4	Oahu Metropolitan Planning Organization	Attn.: Alvin Au, Executive Director Oahu Metropolitan Planning Organization 707 Richards Street, Suite 200 Honolulu, Hawaii 96813 Sent via email to: alvin.au@oahumpo.org	Sent 11/23	Did Not respond
4.5	Hawaiian Telcom	Attn.: Su Shin, President and General Manager Hawaiian Telcom 1177 Bishop Street Honolulu, HI 96813 Sent via email to: Kalani Andrade , Kalani.Andrade@hawaiiantel.com	Sent 11/23	Did Not respond

4.6	Hawaiian Electric Company	Attn.: Shelee Kimura, Vice President, Corporate Planning & Business Development Hawaiian Electric Industries Corporate 1001 Bishop Street, Suite 2900 Honolulu, Hawaii 96813. Sent via email to: Shelee.Kimura@hawaiianelectric.com	Sent 11/23	Did Not respond
4.7	Kailua Neighborhood Board No. 31	Attn.: Bill Hicks, Chairperson Kailua Neighborhood Board No. 31 923 Akumu Street Kailua, HI 96734 Sent via email to: billhicksknb@gmail.com	Sent 11/23	Responded with comments
4.8	Lani-Kailua Outdoor Circle	Attn.: Diane Harding, LKOC President Lani-Kailua Outdoor Circle P.O. Box 261 Kailua, HI 96734 Sent via email to: ani-kailua@outdoorcircle.org	Sent 11/23	Responded with comments
4.9	Hawaii's Thousand Friends	Attn.: Donna Wong, Executive Director Hawaii's Thousand Friends 335 Hahani Street #342132 Kailua, HI 96734 Sent via email to: htf3000@gmail.com	Sent 11/23	Responded with comments
4.10	Dr. Charles Prentiss	Dr. Charles Prentiss Kailua, HI Sent via email to: prentissc@outlook.com	Sent 11/23	Did Not respond
4.11	HAWAII AUDUBON SOCIETY	Attn.: Linda M. B. Paul, HAS President HAWAII AUDUBON SOCIETY 850 Richards Street, Suite 505, Honolulu, HI 96813-4709 hiaudsoc@gmail.com		Sent comments

1.10 Changes Made to the DSEIS (New Section)

Significant changes were made to the Draft SEIS (DSEIS). Figure 1.10.1 illustrates the process of preparing the content of the Final SEIS (FSEIS). The DSEIS was published November 23, 2020 for an official 45-day review period. Interested parties could download the about 500-page DSEIS report. The DESIS report had one technical appendix, Appendix A, which described the public scoping meeting and the responses received.

Responses received on the published DSEIS contained a total of about 200 comments. The comments and recommendations prompted several site development design changes and more detailed technical explanations about site development and impact mitigation approaches. It was decided that the best approach to develop the contents of the FSEIS document was to create separate technical appendices, each dedicated to a certain aspect of the site development approach and impact mitigation.

Figure 1.10.1 indicted five additional submittals that were requested by the Accepting Agency. It was agreed that these additional information, referred to as "Referenced technical reports", would be submitted later than submittal of the FSEIS document. The preparation of the "Reference technical reports" required communication with the responsible agency.

The status of the five referenced technical reports are as follows:

1. Updated timeline: An updated project timeline has been developed and will be submitted after the FSEIS is accepted, to implement the final site development plan in the accepted FSEIS.
2. Updated Constructing Management Plan (CMP): An updated CMP has been developed and will be submitted after the FSEIS is accepted, to implement the final site development plan in the accepted FSEIS.
3. Traffic Management Plan (TMP): A new TMP is being developed and will be submitted after the FSEIS is accepted.
4. Traffic Impact Analysis Report (TIAR): An updated TIAR will be developed in coordination with the State Department of Transportation after the FSEIS is accepted.
5. Updated proposed scope of Roadway Improvements: A proposal was submitted to and reviewed by the City and County of Honolulu, Department of Planning and Permitting, Traffic Review Branch (TRB). The cooperation with TRB continues and the final traffic improvements measures are still under development.

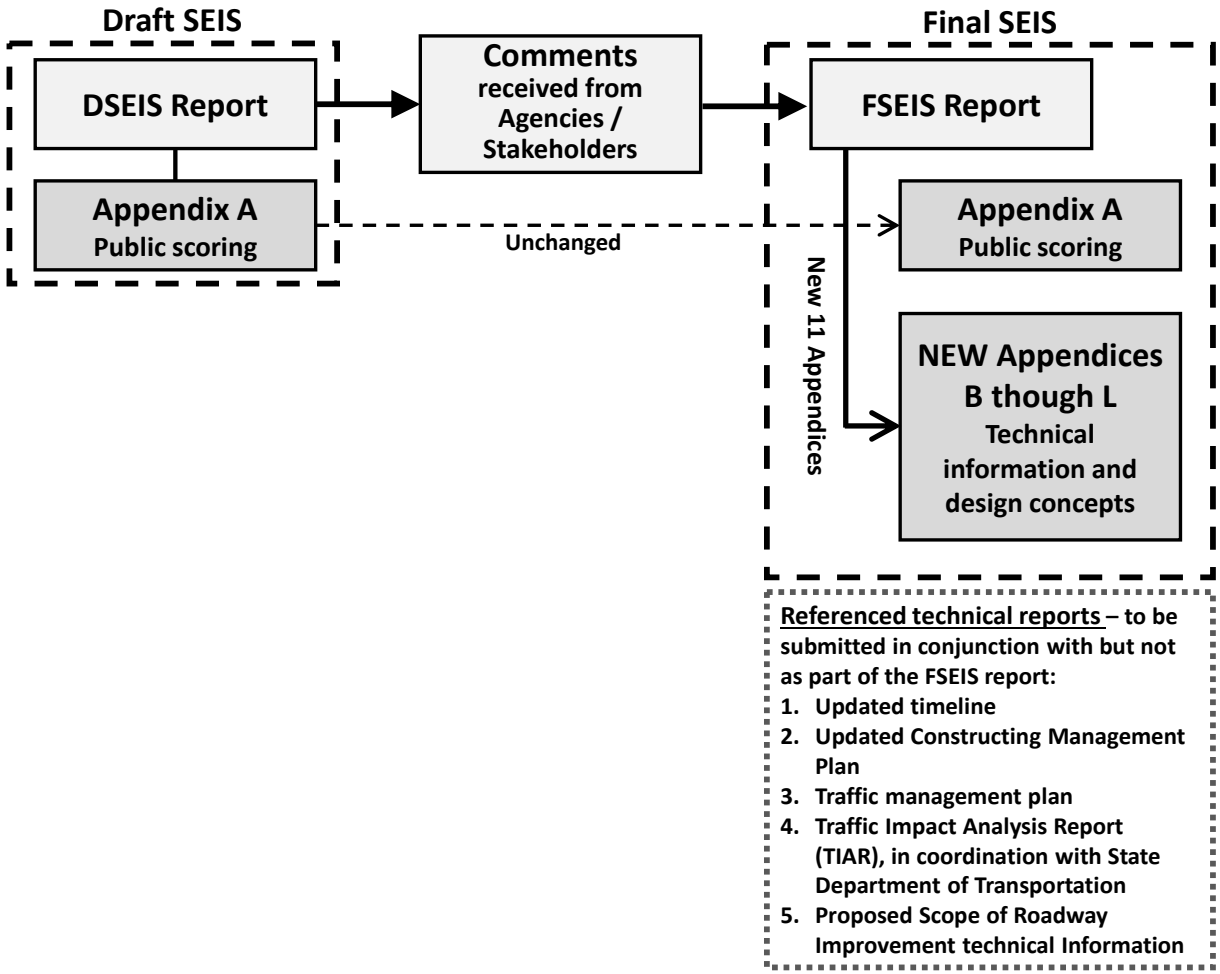


Figure 1.10.1: Changes made to the Draft SEIS to prepare the FSEIS and additional information requested

CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and alternatives are described in Section 2 of the 2011 FEIS. This section presents brief summaries of the descriptions given in the 2011 FEIS and describes changes relative to the updated site development plans.

2.1 Proposed Action as Defined in the 2011 FEIS

The 2011 FEIS described the proposed project as the planned expansion development of a light industrial park on three contiguous land parcels in the Lower stretches of the Kapa'a Valley on the windward side of Oahu. The expansion created needed industrial zoned space for businesses within the Koolau Poko region.

The 2011 FEIS listed the following measures to implement the Proposed Action. Updates to the 2011 FEIS Proposed Action are briefly discussed as "Updates under this SEIS" following the initial bullets:

1. About 25 acres of newly rezoned land that would support businesses to expand or relocate light industrial activities within the Kailua and Kaneohe regions:

   Update related to this SEIS: This goal of the 2011 Proposed Action to "support businesses to expand or relocate light industrial activities within the Kailua and Kaneohe regions" is still in effect. While the 2011 FEIS was a prerequisite for a subsequent zone change, the rezoning of 25 acres of land occurred in 2013.

2. A new light industrial park that will be developed as an expansion of an already existing industrial warehouse development, taking advantage of already existing infrastructure, and expanding the light industrial land use at the site.

   Update related to this SEIS: The expansion of the already existing industrial warehouse development and taking advantage of already existing infrastructure was facilitated with a Joint Development Agreement between the two landowners who make up the ownership of the Kapa'a Light Industrial Park. The Joint Development agreement allows sharing of infrastructure and the construction of buildings over property lines so that fill synergy can be used to develop the light industrial park.

3. Land for industrial activities that are located on former landfill area. The development of the landfill area will reduce problems of soil erosion and resulting runoff.

   Update related to this SEIS: This element of the 2011FEIS is still in effect and is even more effectively implemented under the updated site development plan than envisioned in the 2011 FEIS. The fact remains that a former land fill is developed and put to good use as the site for an important development. Development on a former landfill requires site development technologies that deviate from developments on land with regular soil. As a condition in the 2013 zone change, infiltration of rainwater into the landfill should be avoided so that potentially harmful leachate is avoided, and with it, related impacts to the environment. Leachate from landfill is defined as

polluted water created by precipitation percolating through the landfill body. The updated site development plan transforms the site to almost completely impervious land, thus eliminating infiltration of precipitation and the creation of leachate in the landfill body.

4. A total of 625,000 square feet of newly constructed industrial zoned space in modern warehouse structures or, as an alternative, several acres of base yard space which would replace a specific amount of warehouse space. Since 19,000 square feet of existing warehouse space planned to be demolished, this results in a net addition of 606,000 square feet of warehouse space at the proposed site.

   Update related to this SEIS: The total full build-out warehouse space in the light industrial park planned under the updated development plan described in this SEIS remains basically the same as the 2011 FEIS, since it is only 0.3 % larger under the updated site development plan.

5. Infrastructure to supply the new industrial space with water and electric power by interconnecting with municipal water and power infrastructure.

   Update related to this SEIS: A reliable supply of electricity and water is supported by implementing energy and water saving technology. The adequate electricity supply to the expanding park will be supported by new power lines which will are planned for installation in 2021 . Savings of potable water will be through the use of harvest rainwater for irrigation.

6. Onsite wastewater treatment. The project site as well as the entire Kapa'a Valley is presently not connected to the municipal sewage system, and a connection would require a forced sewer system.

   Update related to this SEIS: there are still no plans to connect the site to the municipal sewer system. The proposed onsite wastewater treatment technology under the updated site development plan would allow significantly higher pollutant removal than the wastewater treatment systems considered under the 2011 FEIS. Thus, lowering related impacts.

7. A comprehensive stormwater system that avoids high peak discharge rates during heavy storm events and avoids polluted runoff from the site into the receiving waters. The stormwater system would comprise runoff conveyance in swales, channels and pipes, detention ponds, stormwater treatment units to eliminate floatables and significantly reduce sediments, oil and nutrients content in the stormwater, and rainwater harvesting systems. The measures of quality and quantity control of stormwater differ between the parts of the proposed industrial park.

   Update related to this SEIS: The goals of the 2011 FEIS to implement highly effective storm water treatment and management systems are still in effect and the planned storm water system for the site will still include comprehensive treatment and management technologies. While the storm water system that was delineated in the 2011 FEIS was somewhat ahead of governmental

regulations at that time, the governmental guidelines and standard have since been amended to include measures that were already part off the 2011FEIS plans. It remains a main objective of the project to use storm water systems which not only satisfy the prevailing regulatory requirements but go beyond to reduce storm water related impact as much as possible under the development conditions.

8. Sufficient on-site (off road) parking for the additional employees and visitors of the development on site as well as facilities for parking and loading of heavy trucks within the development.

   Update related to this SEIS: This site development goal is still in place.

9. Development of the larger part of the rezoned land in accordance with low impact development technologies and principles. The Lower portion of the proposed site, which comprises the larger part of the land to be rezoned, is near environmentally and culturally important wetland.

   Update related to this SEIS: This site development measure goal is still in place and will be used to develop the Lower site in accordance with low impact development (LID) technologies. This includes implementing LID storm water strategies which will be used throughout the entire site, where technically possible.

10. In accordance with the recognized need for low impact development approaches, the Lower portion of the site would implement design, construction, and operational measures to achieve Leadership in Energy and Environmental Design (LEED) certification upon completion of the project. The LEED development approach for the development involves measures to limit impacts derived from the site, efficient use of water and energy, material reuse and recycling as well as Lowering indoor environmental impacts. The LEED certification is a quantifiable measure for the environmentally friendliness and energy effectiveness of the proposed action.

    Update related to this SEIS: The Applicants are still committed to develop the Lower site in accordance with the LEED green building standard.

2.2 Ability of Region to Absorb Amount of Planned Additional Industrial Space

For the 2011 FEIS a market study was conducted to determine if the region that will be served by the proposed Action, thus the Koolau Poko region, could absorb the planned industrial space, including warehouses and base yards. The main conclusions of the market study corroborated the need for the project to provide industrial zoned space and the ability of the region to absorb the planned amount of added industrial space. The conclusions presented in the 2011 FEIS were as follows:

1. The Koolau Poko region, also characterized as "Greater Kailua/Kaneohe" from the trade area perspective, has a significantly undersupplied industrial sector, when compared with any urban

regions on Oahu. The area currently only supplies about 21 percent of the industrial space demand created by the size of its resident population.

2. The market study predicts that over the next 20 years (through 2030) the Koolau Poko region will readily support an additional about 1,000,000 gross square feet of industrial-type floor area or about 96 acres of vacant industrial zoned. The 606,000 square feet of new floor space that the proposed project will provide would therefore only provide some 63% of the predicted demand. Currently there is limited available land in the region that is appropriately zoned for industrial-type activities and industrial lands in the region are being diminished by ongoing or planned transformation to higher return commercial or residential development. Due to this limited alternative availability of industrial-type floor space in the region, it can be assumed that the proposed project will be able to lease all its planned space.

3. Based on historical trends it is forecasted that it would take from 15 to 17 years for the proposed 606,000 square feet of expanded floor space in the Kapa'a Light Industrial Park to reach full adsorption. For the subsequent analysis in this SDEIS a development time of 15 to 17 years is still assumed.

This project team considered that the basic premises of the 2010 market study is still valid. In the time since the 2011 FEIS more of older industrial space in the Kailua and Kaneohe region has been retired or is scheduled for retirement, without concrete plans to replace the lost industrial space with equally zoned space. A trend in the urban region of Kailua and Kaneohe is the conversion of industrial or commercial space to residential, thus higher revenue generating space.

The Applicants have reported that the average vacancy rate of the KLIP is low, around 4%. Leasable space that becomes available is typically leased out to new tenants within a short period. The Applicant further reported that the demand for smaller industrial zoned spaces remains high, with most of the new tenants coming from within the windward region.

Finally, the Applicants are not increasing the square footage of space significantly from the 2011 FEIS.

<u>The Accepting Agency determined in their response to the DSEIS that the demand for the proposed expansion of the Kapa'a Light Industrial Park was demonstrated in the 2011 FSEIS. The Accepting Agency further indicated that proposed land use had not changed since it was reviewed and accepted by the DPP for the 2011 Final EIS.</u>

2.3 Site Development Alternatives

Alternative site development strategies were discussed in Section 2.3 of the 2011 FEIS. Two 2011 FEIS action alternatives and a No-Action alternative were considered. These two alternatives with proposed actions were identified as the FEIS Preferred Alternative and FEIS Alternative B.

The FEIS Preferred Alternative and FEIS Alternative B differed in their use of construction technologies and the use of the open space that directly surrounds the proposed site.

- Under the FEIS Preferred Alternative, the development of the Lower and Upper portions of the site would be developed. The Lower portion of the site, which means the part of the site adjacent to wetland area, was designed using low impact development practices. The Preferred Alternative proposed sustainable building technologies and the use of open space adjacent to the project site as restored habitat.
- Under the FEIS Alternative B, the Lower and Upper portions of the site would be developed, and all parts of the proposed industrial park would be designed using conventional building technologies.

While the FEIS Alternative B was satisfying basic applicable local, State and Federal codes, the FEIS Preferred Alternative exceeded this basic code requirement to derive a Lower ecological footprint. FEIS Alternative B results in less development costs than the Preferred Alternative, due to the additional costs for sustainable building technologies and site development approaches.

In addition, the FEIS No-Action alternative was evaluated. The FEIS No-Action alternative was required by statute and described impacts at the proposed site and for the region if no additional industrial space is added to the existing space. Under the No-Action Alternative no further addition of warehouse space would occur on the portions of the site covered by the 2011 FEIS.

Of the three alternatives, the FEIS Preferred Alternative was selected as the basis of the subsequent site development work. Design and construction efforts to implement the FEIS Preferred Alternative have been going on since the acceptance of the 2011 FEIS.

Two alternatives are discussed in this DSEIS in relation to their ability to mitigate impacts. These two alternatives do not deviate from the basic development objectives of the FEIS Preferred Alternative, but they differ in approach of how they use specific site development technologies and impact mitigation strategies.

- The **SEIS Preferred Alternative** is described as implementing the proposed changes to the updated site development strategies and using best-in-class impact mitigation measures. These proposed changes were described in Section 1 of this DSEIS document, and they include issues related to mitigating storm water, water, wastewater, and traffic impacts.

- The **SEIS No-action Alternative** is described as NOT implementing these proposed updated site development plan and the more effective impact mitigation measures. Instead, under the SEIS No-Action alternative the site development strategies will be implemented that reflect only the conditions of the 2011 FEIS Preferred Alternative as well as applicable governmental standards that were subsequently enacted.

Figure 2.3.1 shows a flow chart of the alternatives referenced in this SEIS document and describes how the SEIS alternatives relate to the alternatives used in the 2011 FEIS and subsequent design modifications for required permit compliance and shows the differences in the actions of the two SEIS alternatives. The prefixes "FEIS" and "SEIS" are used to distinguish between the 2011 FEIS and the 2021 SEIS alternatives.

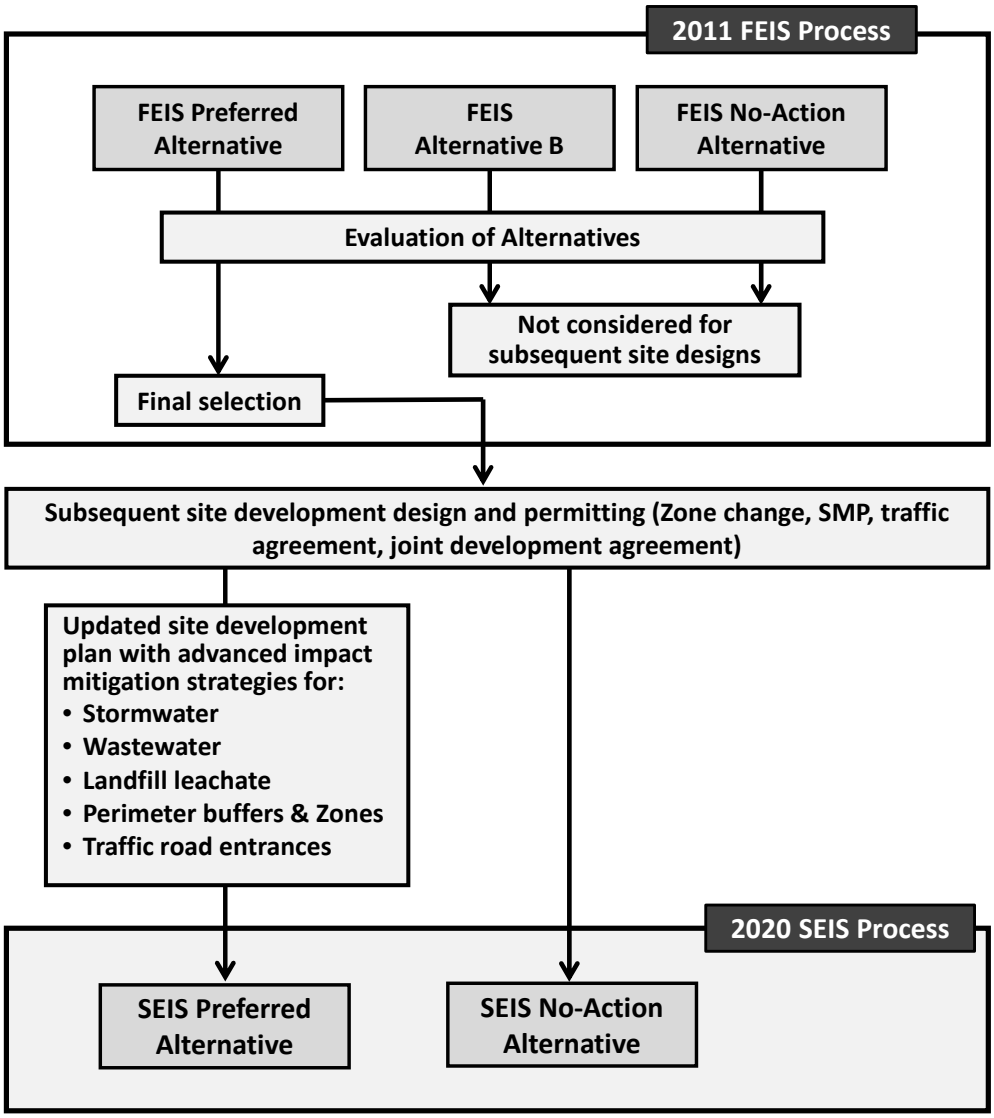


Figure 2.3.1: Flow chart to describe the interrelationship of the two SEIS and three FEIS alternatives

Under the 2011 FEIS Three alternatives were addressed in the 2011 FEIS, (1) the FEIS Preferred Alternative, (2) the FEIS Alternative B, and (3) the FEIS No-Action Alternative. The FEIS alternatives (2) and (3) were not considered further for subsequent site designs. The FEIS Preferred Alternative was selected as the basis for the subsequent, more detailed site development planning.

After the 2011 FEIS was approved, the site development concepts presented in the 2011 FEIS were detailed in design efforts to evaluate the compatibility of the site conditions and the proposed site development design infrastructure, based on detailed engineering site evaluations, and changing land use permitting.

Considering adjustments and refinements of the site design have been an evolving process since the 2011 FEIS was approved. The site design evolved through the 2013 zone change process (Ordinance 13-35) and the 2014 Special management are use permit (SMP) (2014/SMA-27) permitting. Further site development modifications followed with the 2016 and 2017 SMP minor modifications, which were approved to allow grading stockpiling and a new storm water design.

The updated site development plan considered a range of design changes and included new and more efficient impact mitigation measures. The updated site development plan further removed the 3.8-acre base yard, and instead proposes this area for new warehouse developments.

Specifically, the revised storm water design under the approved 2017 SMP modification (2017/MOD-37) used a combined vegetated swale and below ground infiltration vaults approach to use LID technologies for storm water treatment. A geotechnical report completed in 2019 (Stewart Engineering, 2019) in conjunction with planned site grading in the Lower site determined that the storm water treatment and management approach delineated and approved in the 2011 SMP minor modification could not be implemented. The reason was that infiltration and subsequent migration of infiltrated water under the perimeter earth berm would contribute to perimeter berm instability. Consequently, a different storm water treatment and management design was completed which is part of the updated site development plan. This updated storm water plan necessitates an increase of the finish grade elevation to provide the necessary hydraulic energy for gravity flow of storm water runoff to the treatment facilities at the Northern site perimeter.

In addition, the updated site development plan proposed the use of advanced onsite wastewater treatment in the entire project site. This advanced wastewater treatment technology significantly reduces environmental impacts caused by treated wastewater disposal on-site. The advanced wastewater treatment would significantly reduce organic, TSS and nutrient loads in the effluent.

The two SEIS alternatives, the SEIS Preferred Alternative and the SEIS No-Action Alternative, differ from each other by whether the updated site development plan is used. The SEIS Preferred Alternative uses the updated site development plan, while the SEIS No-Action Alternative does not. The SEIS No-Action Alternative uses the site development approach that is based on the design concepts from the 2011 FEIS, the 2013 zone change and the 2014 SMP and the subsequent 2017 SMP minor modification. The issue to consider is that the storm water system approved under the 2017 SMP minor modification is no longer technically viable because of the mentioned berm instability. Therefore, the storm water

treatment and management system proposed under the updated site development would need to be implemented with the required increase of finish grade elevation.

2.4 Siting of Facilities

Section 2.4 of the 2011 FEIS discussed General siting of facility criteria include consideration of compatibility between the functions of the proposed industrial development and the consideration for the environment and the community. Furthermore, siting of facility criteria included land use, adequacy of the site for the function required, proximity to related activities, availability and capacity of roads, efficient use of property and resources, development approaches and special site characteristics, including environmental compatibilities. Section 4 of the 2011 FEIS stated the following siting facility criteria (in alphabetic order):

- Accessibility with alternative transportation
- Acreage/height limitations
- Areas of no-constructability, preservation of open space and habitat
- Building and fire codes
- Business objectives and measures to implement business objectives.
- Disruptions due to construction
- Drainage and stormwater treatments
- Economics (life cycle cost, construction cost, operations, and maintenance costs)
- Environmental aspects
- Historical and cultural considerations
- Impact on endangered species
- Impacts on utilities and resource capacity
- Improvement of regional economic base (tax revenues, added employment, growth
- Land use regulations and considerations
- Local/Regional planning regulations and guidelines
- of regional economy)
- Orientation (i.e. sun and wind exposure)
- Outdoor lighting
- Parking requirements
- Permitting
- Phasing
- Regional, State, and Federal planning
- Restoration of habitat
- Site work
- Soil considerations
- Topography
- Traffic (level of service, emissions, safety, flow capacity)
- Utilities availability
- Visual impact
- Waste management
- Watershed considerations and effects on water quality receiving waters
- Wetlands and Buffer zones (specifically impacts on the adjacent marsh)

The SEIS team concluded that the siting facility criteria were still relevant and adequately addressed in the site development design.

2.5 Comparison of 2011 FEIS and SEIS Preferred Actions

Figure 2.5.1 shows the full build-out layout of the project site delineated in 2011 FEIS Preferred Action. Figure 2.5.1 illustrates the main land use features indicated by the annotations that were added to the original figure of the FEIS (Figure 2-4 in the FEIS). Table 2.5.1 shows the land uses presented in the FEIS.

Table 2.5.1: Land uses as delineated in the 2011 FEIS

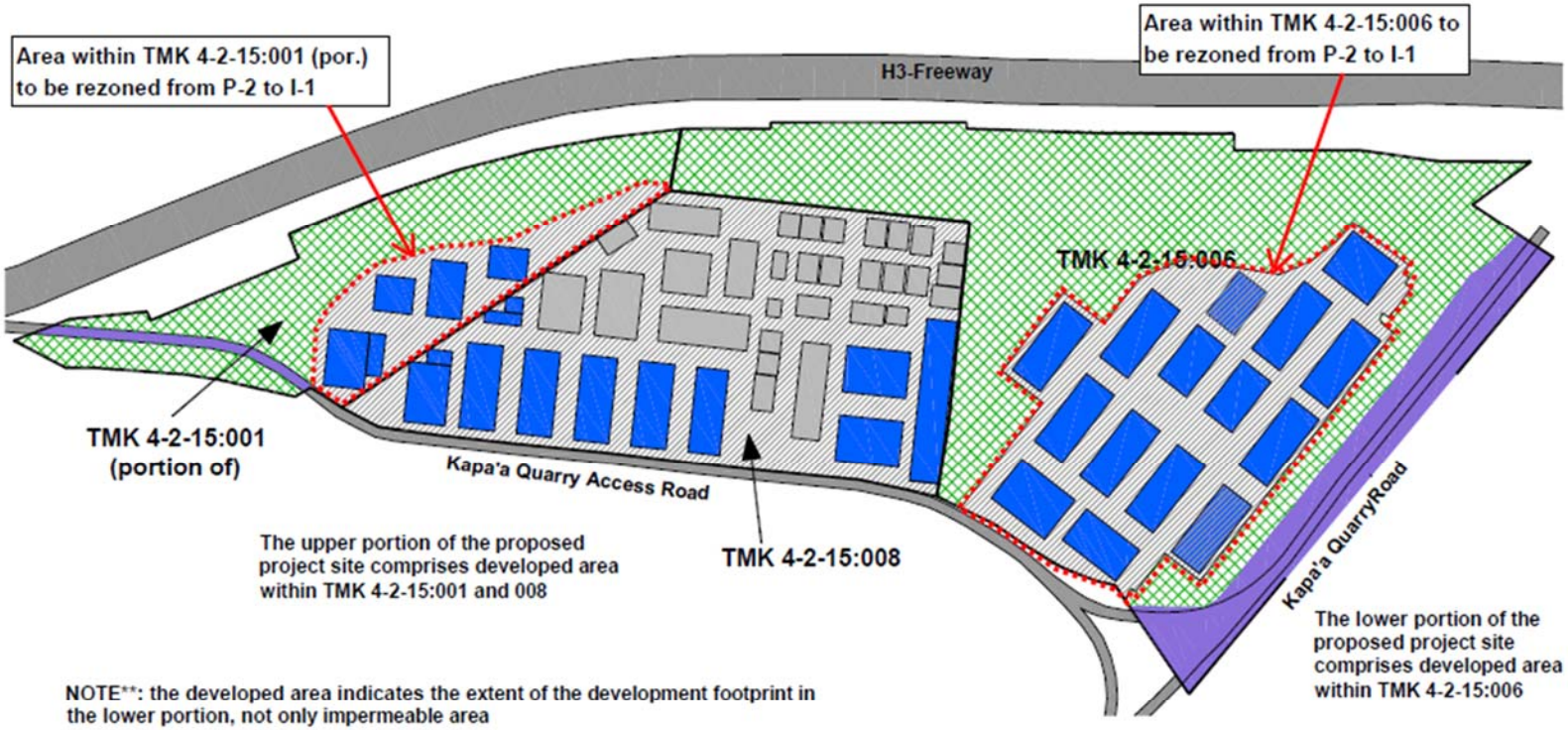
Land use at the project site (delineated in the FEIS)	[acres]	Bldg. footprint [sqft]
Vegetated Land (unimproved)	30.4	
Paved (impervious) area UPPER portion of project site	26.8	
Paved (impervious) area LOWER portion of project site	16.7	
Buildings at Full Build-out, UPPER portion of project site		552,000
Buildings at Full Build-out, LOWER portion of project site		337,000
Other (within parcels but outside project site)	5.1	
Sum of parcels TMK 4-2-15:006, 008 and 012	**79.0**	**889,000**

Figure 2.5.2 shows the full build-out layout of the project site for the SEIS Preferred Action. Figure 2.5.2 illustrates the main land use features indicated by the annotations that were added to the original figure of the FEIS. Table 2.5.2 shows the land uses presented in the FEIS.

Table 2.5.2: Land uses proposed under the updated site development plan described in this SEIS

Land use at the project site at Full Build-out	[acres]	Bldg. footprint [sqft]
Vegetated Land (unimproved)	22.3	
Vegetated buffer zone around the UPPER site perimeter	2.5	
Vegetated buffer zone around the LOWER site perimeter	6.2	
Paved (impervious) traffic area UPPER portion of project site	26.4	
Paved (impervious) traffic area LOWER portion of project site	18.5	
Buildings at Full Build-out, UPPER portion of project site		519,000
Buildings at Full Build-out, LOWER portion of project site		373,000
Other (in parcels but outside project site)	3.1	
Sum of parcels TMK 4-2-15:013 and 014	**79.0**	**892,000**

Note: Parcels TMK 4-2-15:006, 008 and 012 have been renamed TMK 4-2-15:013 and 014



	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetaed area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	0.0	4.4	None	61,000	0.5
TMK 4-2-15:006	22.3	0.0	16.7 (NOTE**)	None	337,000	4.8
TMK 4-2-15:008	0.0	0.0	22.4	283,000	208,000	0.0

Figure 2.5.1: Full build-out layout of the project site under the 2011 FEIS Preferred Action

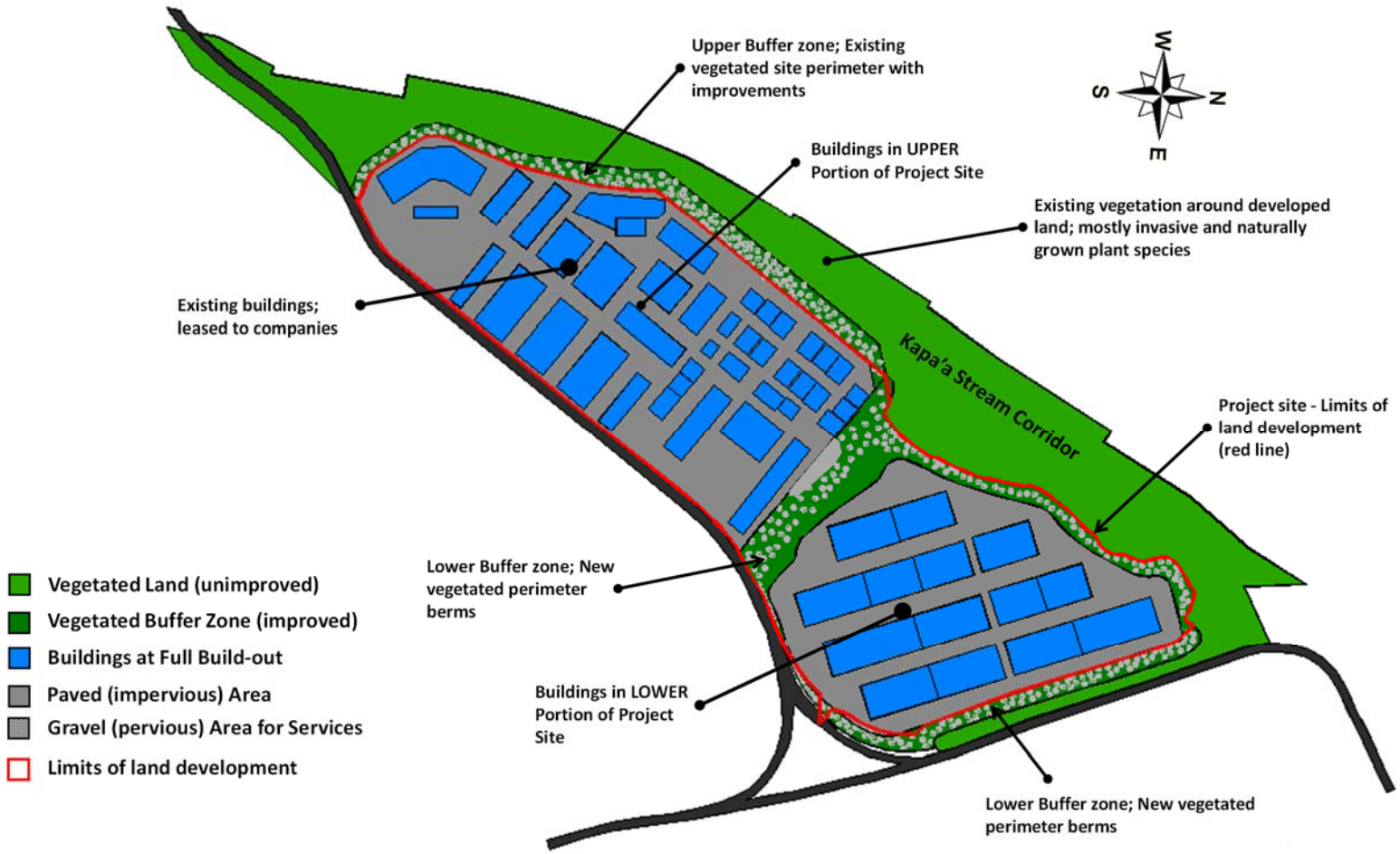


Figure 2.5.2: Full build-out layout of the project site under the SEIS Preferred Action

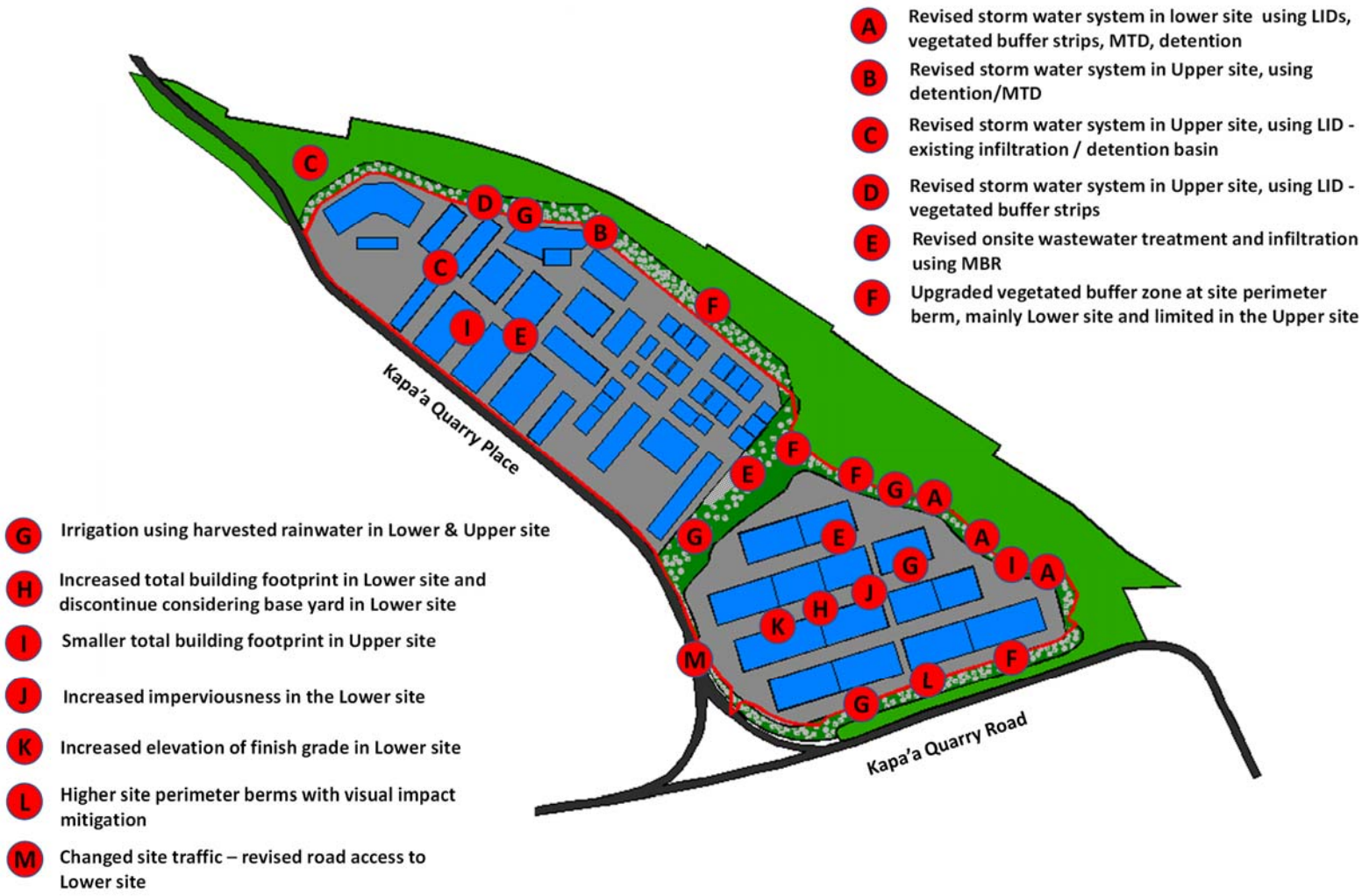


Figure 2.6.1: Illustration of locations of the proposed changes in site development strategies (refer to Table 2.6.1 for description)

2.6 Proposed Changes of Site Development Strategies

Figure 2.6.1 illustrates the locations of the proposed changes in site development strategies. The annotations in Figure 2.6.1 are described below:

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
A	**Revised storm water system in Lower site using LIDs, vegetated buffer strips, MTD, and detention:** The storm water treatment and management system for the Lower site has been altered from the previously disclosed configuration in the 2011 FEIS and applicable SMP No. 2014/SMA-27 and Minor Modification for SMP No. 2014/SMA-27, 2017/MOD-37 (MT) The proposed revised storm water system for the Lower site includes conveyance of storm water runoff through drainpipes, treatment of storm water in vegetated buffer strips and Manufactured Treatment Devices (MTD) and detention in below ground vaults before controlled release through several outlets to the Kapa'a Stream Corridor. <u>The updated storm water system for the Lower site is described in Appendix C.</u>	The impact mitigation strategies include effective storm water runoff treatment and therefore less source contamination as well as less soil erosion in the Kapa Stream corridor. Therefore, impacts to the Kapa'a Stream corridor and the stream as the receiving water will be Lower than the impacts disclosed in the 2011 FEIS.
B	**Revised storm water system in Upper site, using detention/MTD system.** The stormwater treatment and management for five new warehouse structures has been completed. This storm water system includes detention of storm water runoff in below ground drainpipes and one vault. The detained water is controlled released to a Manufactured Treatment Device (MTD) where it is filtered. During heavy storm events, water can overflow the detention vault and be discharged directly to the Kapa'a Stream corridor via a new armored outfall at the sloped site perimeter. The armored outfall	The impact mitigation strategies include effective storm water runoff of the water collected in the detention vault, which is the water quality (WQ) relevant water volume. Soil erosion is minimized through an armored outfall. Therefore, impacts to the Kapa'a Stream corridor and the Kapa'a Stream, the receiving water, will be Lower than the impacts disclosed in the 2011 FEIS.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	protects the sloped site perimeter from soil erosion.	
C	**Revised storm water system in Upper site, using LID - existing infiltration / detention basin**: More buildings and traffic area in the Upper site will be connected to an existing infiltration and detention basin, which serves as an effective LID treatment strategy.	With more traffic areas and building connected to the existing infiltration and detention basin, which serves as an effective LID strategy, storm water impacts are lowered relative to the situation that was disclosed in the 2011 FEIS.
D	**Revised storm water system in Upper site, using LID - vegetated buffer strips**: The storm water treatment and management system of two new building in the Upper site will include vegetated strips. (refer also to point G: Harvested rainwater will be used to irrigate the vegetated buffer strips)	Connecting the new buildings and traffic areas to new vegetated strip buffer areas, which serves as an effective LID strategy, will lower impacts relative to the situation that was disclosed in the 2011 FEIS.
E	**Revised onsite wastewater treatment and infiltration using MBR**: A new and advanced onsite wastewater treatment system, which uses a Membrane Bioreactor (MBR) treatment technology has been implemented in the Upper portion of the site as part of a pilot project. The effluent of the advanced wastewater system can be used for unrestricted outdoor recycled water applications, including irrigation, as permitted under the National Sanitation Foundation (NSF) 350 standards. The treated wastewater is infiltrated in drain field that resembles rainwater runoff infiltration. The pollution reduction in the MBR system far exceeds conventional septic system. After the successful completion of the pilot project the advanced wastewater system will also be implements for the onsite sewage management in the Lower site.	With significantly lower organic and nutrient loads in the treated effluent the impacts to the environment are lower than in the 2011 FEIS. The implementation of the advanced wastewater system was done on a voluntary basis by the Applicants. The ongoing pilot project was proposed to and approved by the Department of Health (DoH) as a technology innovation project. <u>The main objective of the pilot project is verification verifies the hydraulic performance of the infiltration field which has a smaller dimension that soil absorption fields used for conventional wastewater systems and delineated in HAR 11-62.</u>

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
F	**Upgraded vegetated buffer zone at site perimeter berm**, mainly Lower site and limited in the Upper site: The vegetated site perimeter will be upgraded to provide impact mitigation for the adjacent land. • In the Lower site: This includes creating a dense vegetation for noise and fugitive dust impact mitigation. Larger trees will be planted on the perimeter berms to provide visual impact mitigation. • In the Upper site: The existing vegetation at the site perimeter, which is a steep sloped berm, will be enhanced to increase soil stabilization. At the locations where vegetated buffer strips are used for storm water runoff treatment new vegetation will be planted. <u>The update of the buffer zone development plan that was submitted to the Accepting Agency is described in Appendix I.</u>	Installing the vegetated buffer at the perimeter of the Lower portions of the site will provide effective impact noise and fugitive dust mitigation. Visual impacts will be mitigated through larger trees which will shield warehouse structure from external views. Installing the vegetated buffer at the Northern perimeter of the Upper site will provide additional soil stabilization and runoff treatment through vegetation filtration. Installing the vegetated buffer at the Southern side of the Upper site provides attractive views and partially shields buildings from external views. <u>The visual impact mitigation is described in the new Appendix G.</u>
G	**Irrigation using harvested rainwater in Lower & Upper site**: Rainwater will be harvested, stored, and used for irrigation in the Lower and Upper site. In the Lower site irrigation will be used for the vegetated buffer on the site perimeter berms as well as for multiple vegetated buffer strips that are used as LID storm water treatment. In both the Lower and Upper sites rainwater will be harvested from the building roofs to only collect cleaner runoff. The runoff will then be stored in below ground vaults and	Harvesting rainwater and using it for irrigation saves potable water and therefore Lowers impact on the municipal water supply. In addition, water that is used for irrigation Lowers the volume of storm water runoff.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	pumped to the point of use of the irrigation system.	
H	**Increased total building footprint in and discontinue considering base yard in Lower site**: While the overall building footprint at the project site, thus the sum of building footprint in the Lower and Upper site, remains the same, more building footprint area will be in the Lower portion of the site. The presently approved site layout by the SMP permit No. 2014/SMA-27 featured a 3.7-acre base yard in the Lower portion of the site. This base yard will no longer be part of the updated development plan of the Lower site. Therefore, the added warehouse footprint approximately equals the area that was reserved for the removed base yard.	Impacts associated with the size of buildings will remain approximately the same since the total building footprint in the KLIP will basically remain the same as reported in the 2011 FEIS. Removing the base yard from the site development plans of the Lower site will reduce impacts since impacts are typically Lower from closed buildings than open base yard.
I	**Smaller total building footprint in Upper site**: The building footprint in the Upper site will be Lower than disclosed in the 2011 FEIS.	Analogously to Point H impacts will be lowered with a smaller total building footprint than disclosed in the 2011 FEIS. An impact mitigation strategy that can directly lower impacts of buildings is implementing storm water pollution prevention measures that are associate with the operation of the buildings.
J	**Increased imperviousness in the Lower site**: With eliminating much of the vegetated and pervious areas in the site interior the imperviousness of the Lower site will increase. The typical preferred approach of LID storm	Increasing the imperviousness causes impacts with opposite environmental consequences. Adding impervious cover to the Lower site lowers impacts to the aquatic resources from leachate

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	water management is infiltrating as much storm water at the site and thereby reducing the quantity of the runoff discharge from the site. Since the site is a former landfill, however, reducing infiltration is a requirement to Lower the formation of harmful leachate. The requirement of avoiding significant infiltration is delineated in the conditional zone change.	created by water percolating through the landfill body. On the other hand, increase imperviousness increases the quantity and the peak flow rates of storm water runoff, which also affect the aquatic resources. In balancing the two impacts, increasing imperviousness while increasing the capacity of the storm water treatment and management system will cause lower overall impacts.
J	**Increased elevation of finish grade in Lower site**: Increasing the elevation of the finished grade in the Lower site by an average of about 11 feet above the previously accepted finish grade grading is required to install the revised storm water system. Raising the finish grade entails the addition of fill that must be brought to the site. Adding elevation to the site body increases the amount of fill which adds added weight on the substratum. Since the landfill body is old it was assumed that the degree of soil consolidation was high and future settling due to the added weight of the fill would be relatively small. <u>The reason for the increase of the finish grade is described in Appendix D. The rational is given why the heights of the proposed buildings in the Lower site should be measured from the proposed finish grade and not from the existing grade.</u>	The impacts associated with increasing elevations of the Lower site finish grade include impacts during construction and operations. Mitigation measures during construction are mainly associated with storm water runoff and traffic of heavy trucks. Mitigation efforts during the operation would follow the same type of mitigation measures that would be taken with a site that has Lower elevations.
K	**Higher site perimeter berms with visual impact mitigation**: Higher site perimeter earth berms are required to contain the added fill of the	Impacts associated with increasing the height of site perimeter berms include impacts during the construction and operations.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	increase finish grade (see Point J). Higher berms also have wider widths. Since the outside dimension of the site remain the same as with lower perimeter berms, higher and wider berms reduce the usable land inside the site perimeter since the berms are set back more towards the site interior. Higher berms will require more vegetation added for soil stabilization. Since higher berms are more visible from external view planes visual impact mitigation by adding vegetation and taller trees becomes more important. Appendix G describes added visual impact mitigation measures through applying color schemes for long-distance impact mitigation.	Impact mitigation during operations will mostly be visual impact mitigation and managing heavy-vehicle traffic. Effective visual mitigation efforts would include adding tall trees and a layer of dense Lower vegetation to the exterior sides of the berms.
L	**Changed site traffic – revised road access to Lower site**: The updated site development plan has one roadway access to the Lower site instead of the two road accesses that were part of the site plans in the 2011 FEIS. The single road access is located about 150 yards West, away from the Kapa'a Quarry Road and the existing road triangle in the Lower parts of the Kapa'a Quarry Place roadway. The elevation of the Kapa'a Quarry Place roadway at the location of the new single road access is nearly the same the interior site elevation. This facilitates the construction of the road access. Locating the new single site access away from the existing roadway triangle makes the traffic flow easier and reduces traffic risks because of better sight distance. Instead of a somewhat complicated four-way intersection from the two- road access	Impacts due to the construction of the single new road access will be lower than the previous two road access described in the 2011 FEIS. Impacts after construction would be reduced due to a simpler traffic patterns of the single road access. In addition to the simpler traffic at the intersection, sight distance impacts will be reduced.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	scenario of the 2011 FEIS, the new single road access would be a conventional T-intersection.	
M	**Relocation of 4 kV power line:** A 1,500-foot section of the existing 4 kV power line which supplies the KLIP needs to be relocated since it currently passes through the Lower site, which blocks development work inside the Lower site. This section of the power line will be relocated to pass entirely outside the project site.	Impacts are described in detail in Appendix L of this FSEIS. Impacts are both short-term, during construction, and long-term, during operations. Appendix L describes the type of impacts by alternative alignments and proposed impact mitigation measures.

2.7 Conceptual Layouts of the Upper and Lower Site Described in 2011 FEIS

Section 2.7 of the 2011 FEIS described the conceptual layouts of the Upper and Lower portions of the site, e.g., Upper and Lower sites. In this Section, the project team reiterates the planned land use and building density as it was described in the 2011 FEIS.

2.7.1 Conceptual Layouts of the Upper Site as Described in the 2011 FEIS

Figure 2.7.1.1 shows the conceptual layout of the full build-out Upper portion of the site as described in the 2011 FEIS as the Preferred Action. Table 2.7.1.1 shows the planned site land use as described in the 2011 FEIS. Table 2.7.1.2 shows the planned additions of buildings in the Upper portion of the site. These planned buildings were to be added to the 283,000 sqft of the existing buildings at the time of the 2011 FEIS.

Table 2.7.1.1: Land use in the Upper portion of the site as described in the 2011 FEIS

Decsription of areas contributing to 2011 FEIS Preferred Alternative	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (portion of)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion of.) in Upper Site	**35.3**	**8.1**	**27.2**

Table 2.7.1.2: Planned additions of buildings in the Upper portion of the site.

ID	Building footprint sqft.	Sqft in parcel TMK 4-2-15:001 (por.)	Sqft in parcel TMK 4-2-15:008
UP 1	23,400		23,400
UP 2	23,400		23,400
UP 3	15,600		15,600
UP 4	0		0
UP 5	21,600		21,600
UP 6	24,000		24,000
UP 7	24,000		24,000
UP 8	24,000		24,000
UP 9	24,000		24,000
UP 10	22,700		22,700
UP 11	23,800	23,800	
UP 12	11,000	11,000	
UP 13	6,000		6,000
UP 14	16,000	16,000	
UP 15	9,900	9,900	
sum **	**269,000**	**61,000**	**209,000**

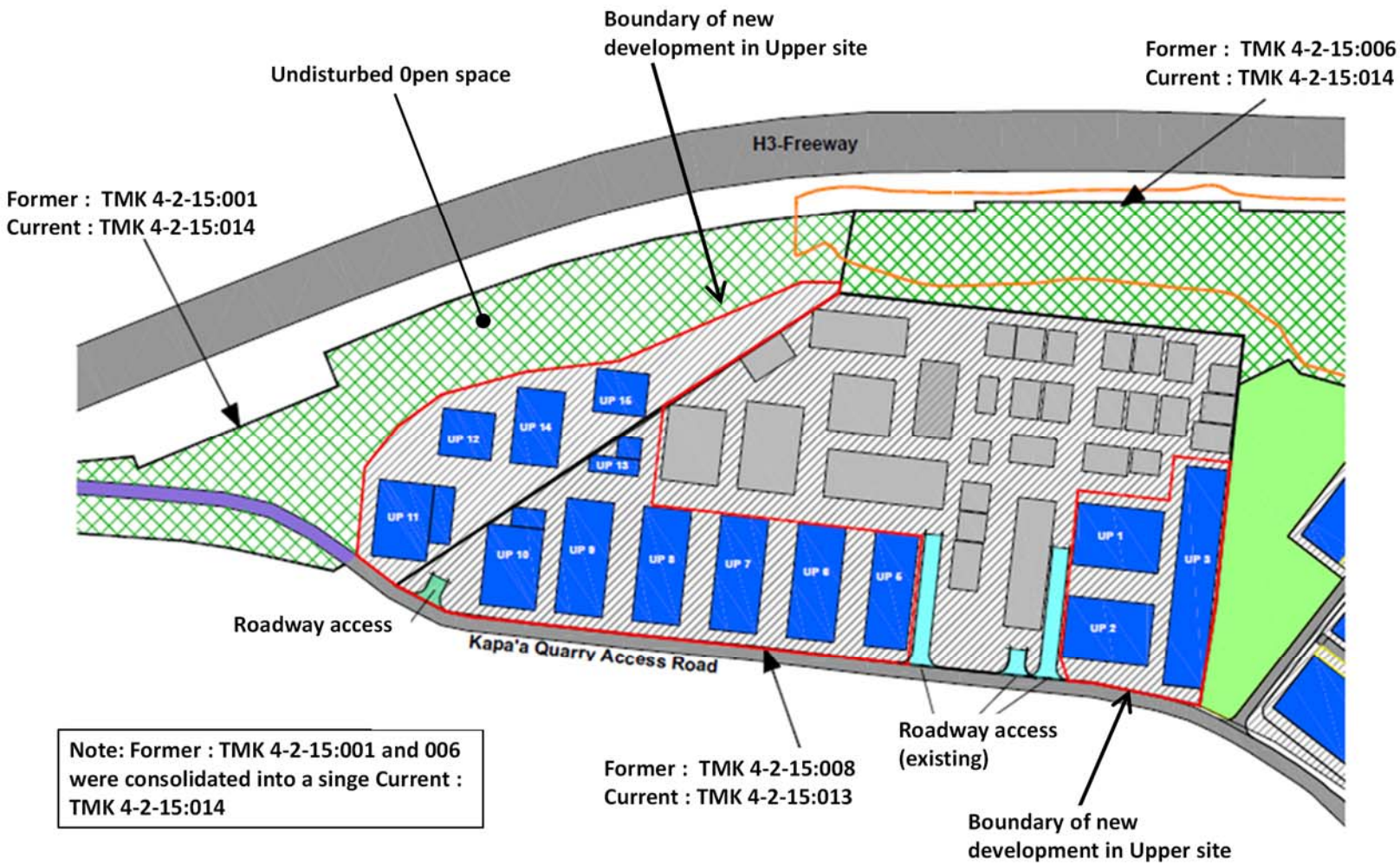


Figure 2.7.1.1: Conceptual layout of the full build-out Upper portion of the site **as described in the 2011 FEIS** as the Preferred Action

2.7.2 Conceptual Layouts of the Lower Site as Described in the 2011 FEIS

Figure 2.7.2.1 shows the conceptual layout of the full build-out of the Lower portion of the site as described in the 2011 FEIS as the Preferred Action.

Table 2.7.2.1 shows the planned land use of the Lower portion of the site as described in the 2011 FEIS.

Table 2.7.2.1: Planned land use of the Lower portion of the site as described in the 2011 FEIS

Decsription of areas contributing to **2011 FEIS Preferred Alternative**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (lower portion of)			
Former TMK 4-2-15:006			
Open space remaining (outside of designated project site)	14.6	14.6	
Designated project site	24.4	11.7	12.7
Other land inside inside parcel but outside the project site.	4.8	4.1	0.7
Sum of TMK 4-2-15:013 and 014 (portion of.) in Lower Site	**43.8**	**30.4**	**13.4**

ID	Building footprint sqft.
LO 1	26,600
LO 2	20,900
LO 3	24,000
LO 4	24,000
LO 5	24,000
LO 6	24,000
LO 7	24,000
LO 8	18,000
LO 9	18,000
LO 10	24,000
LO 11	24,000
LO 12	15,000
LO 13	24,000
LO 14	24,000
LO 15	22,400
sum **	337,000

Table 2.7.2.2: Planned building footprint in the Lower portion of the site as described in the 2011 FEIS.

The 2011 FEIS described the number of planned warehouses and the planned total footprint in the Lower site as 15 and 337,000 sqft.

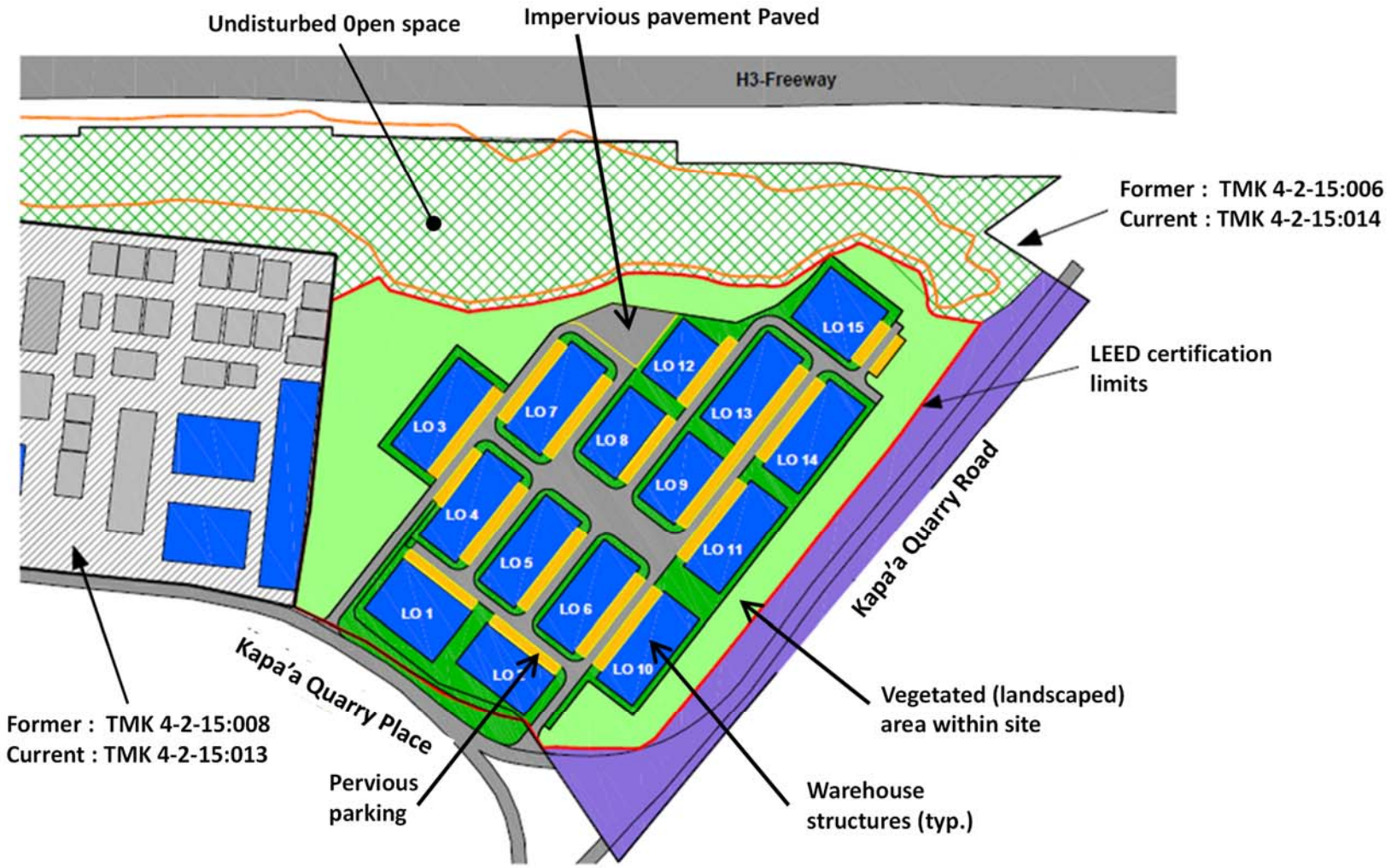


Figure 2.7.2.1: Conceptual layout of the full build-out Lower portion of the site **as described in the 2011 FEIS** as the Preferred Action

2.8 Conceptual Layouts of the Upper and Lower Site Under the 2021 SEIS

This section describes the conceptual layout of the Lower portion of the site under the updated site development plan as described in this FSEIS ~~DSEIS~~.

2.8.1 Conceptual Layouts of the Upper Site Under the 2021 SEIS

Figure 2.8.1.1 shows the conceptual layout of the Upper portion of the site (Upper site) under the updated site development plan.

Tables 2.8.1.1 and 2.8.1.2 show the planned land use within the Upper portion of the site and the planned addition of building footprint, respectively, under the updated site development plan.

Tables 2.8.1.1: Planned land use within the Upper portion of the site under the updated site development plan

Description of areas contributing to **2020 SEIS**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (portion of)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion of.) in Upper Site	**35.3**	**8.1**	**27.2**

Planned Bldg.	**Building footprint** [sqft.]
24 B	17,000
24 C	14,000
32	29,000
33	29,000
34	29,000
35	12,000
sum	**130,000**

Table 2.8.1.2: Planned buildings and their footprints within the Upper portion of the site under the updated site development plan

Note: In the years after the 2011 FEIS was accepted the following buildings have been added to the Upper site:
Bldgs. 24A, 31, 45, 50, 51, 45 with a total building footprint of 97,000 sqft.

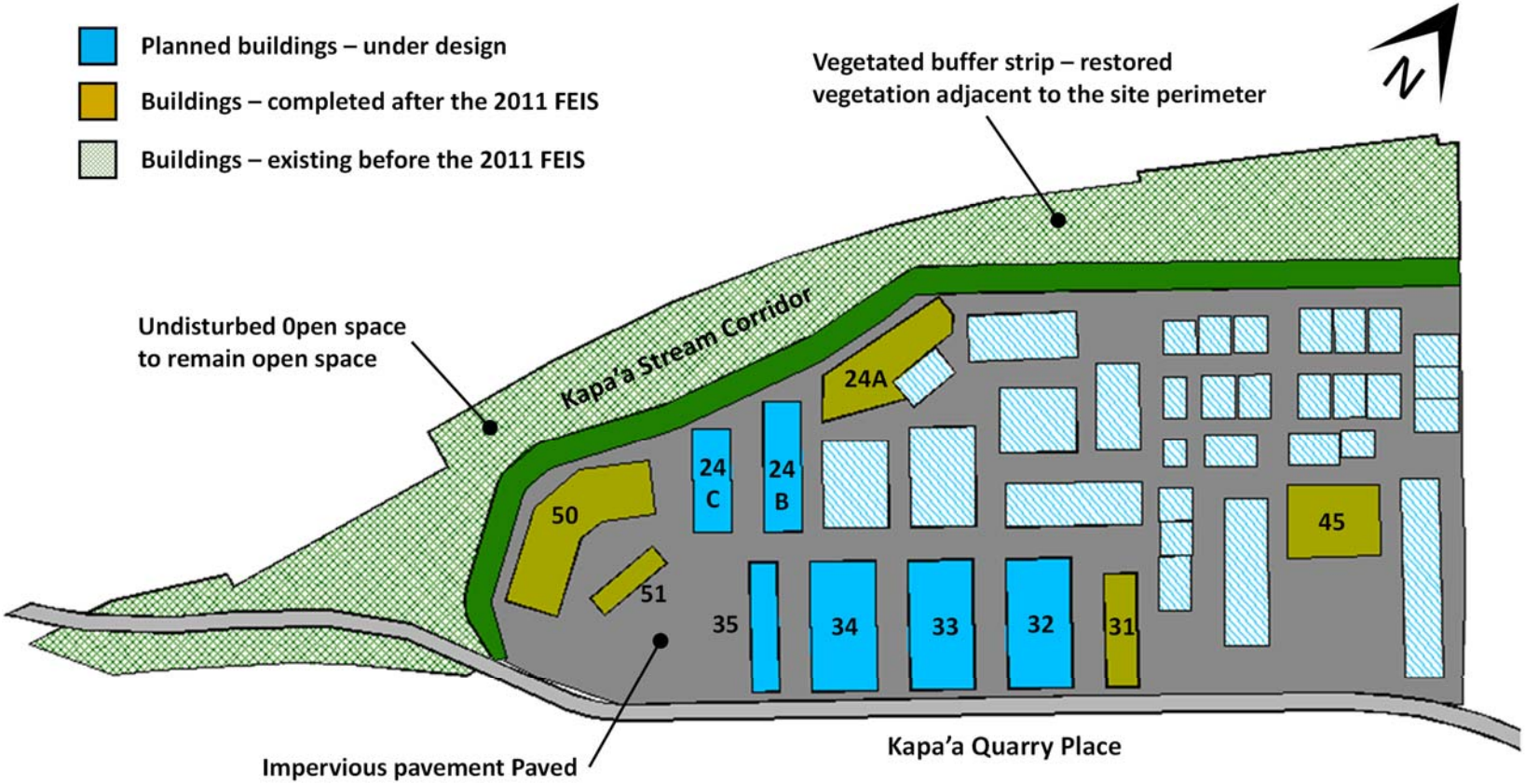


Figure 2.8.1.1: Conceptual layout of the Upper portion of the site (Upper site) **under the updated site development plan (2021 SEIS**)

2.8.2 Conceptual Layouts of the Lower Site Under the 2021 SEIS

Figure 2.8.2.1 shows the conceptual layout of the Upper portion of the site (Upper site) under the updated site development plan.

Tables 2.8.2.1 and 2.8.2.2 show the planned land use within the Upper portion of the site and the planned addition of building footprint, respectively, under the updated site development plan.

Tables 2.8.2.1: Planned land use within the Lower portion of the site under the updated site development plan

Decsription of areas contributing to **2011 FEIS Preferred Alternative**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (lower portion of) Former TMK 4-2-15:006 Open space remaining (outside of designated project site)	14.6	14.6	
Designated project site	24.4	11.7	12.7
Other land inside inside parcel but outside the project site.	4.8	4.1	0.7
Sum of TMK 4-2-15:013 and 014 (portion of.) in Lower Site	**43.8**	**30.4**	**13.4**

Bldg. No	length	width	area
1	220	120	26,000
2	200	120	24,000
3	240	120	29,000
4	180	120	22,000
5	180	120	22,000
6	200	120	24,000
7	320	120	38,000
8	240	120	29,000
9	160	120	19,000
10	160	120	19,000
11	240	120	29,000
12	240	120	29,000
13	240	120	29,000
14	280	120	34,000
		sum	373,000

Table 2.8.2.1: Planned buildings and their footprints within the Lower portion of the site under the updated site development plan

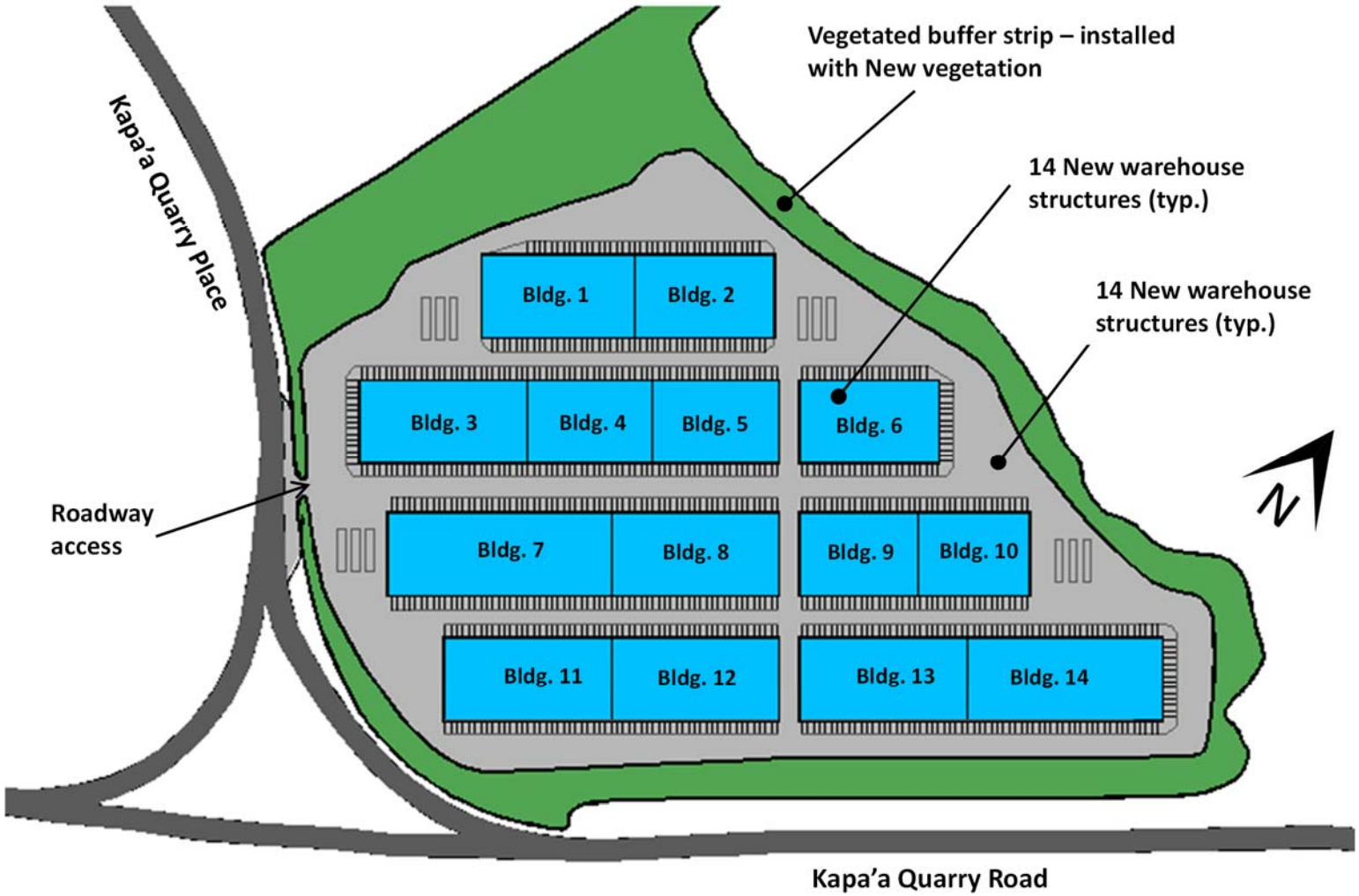


Figure 2.8.2.1: Conceptual layout of the Upper portion of the site (Upper site) **under the updated site development plan (2021 SEIS)**

2.9 Comparison of Planned Land Use and Buildings Between 2011 FEIS and 2021 SEIS

This section of the SEIS describes the differences of the land use and building sizes at the full build-out project site for the 2011 FEIS and the 2021 SEIS conditions.

Table 2.9.1 shows full build-out land use as described in the 2011 FEIS, including the contributions of the Lower and Upper portions of the site. The pervious and impervious land contributions in the two parcels and in the delineated project site, which indicates the limits of the KLIP developments, are indicated. Under the planned full build-out conditions of the 2011 FEIS the total areas of the two parcels TMK 4-2-15:013 and 014 would have approximately the same pervious and impervious land. The 2011 FEIS full build-out project site, within the limits of development, on the other hand would have approximately three quarters as impervious and one quarter as pervious land.

Table 2.9.1: Planned Full build-out Land use for the 2011 FEIS Preferred Alternative

Description of areas contributing to **2011 FEIS Preferred Alternative**	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]
Upper portion of the site TMK 4-2-15:014 (portion in Upper Site)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion in Upper Site)	35.3	8.11	27.2
Lower portion of the site TMK 4-2-15:014 (portion in Lower Site)	43.8	30.4	13.4
Former TMK 4-2-15:006			
Total land area of TMK 4-2-15:013 and 014	**79.1**	**38.5**	**40.6**
	100%	49%	51%

Description of areas contributing to **2011 FEIS Project site**	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]
Upper portion of the site	27.2	0.0	27.2
Lower portion of the site	24.4	11.7	12.7
Sum in Project Site - Upper and Lower site	**51.6**	**11.7**	**39.9**
	100%	23%	77%

Table 2.9.2 shows the same full build-out data as Table 2.9.1, but for the conditions under the updated site development presented in this 2021 SEIS. As Table 2.9.2 indicates the 2021 SEIS full build-out has more impervious land than the full build-out conditions described in the 2011 FEIS.

Tables 2.9.2 and 2.9.3 compares the magnitudes of changes in land use and the building footprints between conditions described in the 2011 FEIS and the 2021 SEIS. The comparison indicates that the full build-out project site under the updated site development described in the 2021 SEIS would increase slightly by not more than 1%. The pervious fraction of the project site would significantly decrease relative to the 2011 FEIS. The full build-out building sizes of the updated site development of the 2021 SEIS would slightly decrease relative to the 2011 FEIS. The Upper site would have less and the Lower site more warehouse footprint relative to the 2011 FEIS.

Table 2.9.2: Comparisons of the magnitudes of changes in land use between 2011 FEIS and the 2021 SEIS.

					Changes relative to 2011 FEIS			
Description of Land use	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]		**Pervious** [acres]	%	**Impervious** [acres]	%
Overall land in 2 parcels; Tmk 4-2-15:013 and 014								
2011 FEIS	79.1	38.5	40.6					
2020 SEIS	79.1	33.1	46.0		(5.4)	-14%	5.4	**13%**
Project site in 2 parcels; TMKs 4-2-15:013 and 014								
2011 FEIS	51.6	11.7	39.9					
2020 SEIS	52.2	6.2	46.0		(5.5)	-47%	6.1	**15%**

Table 2.9.3: Comparisons of the magnitudes of changes in building footprints between 2011 FEIS and the 2021 SEIS.

Building space	**Upper site** [sqft]	**Lower site** [sqft]	**Sum** [sqft]
2011 FEIS			
Existing (at time of 2011 FEIS)	283,000		283,000
Planned	269,000	337,000	606,000
Sum	552,000	337,000	889,000
2020 SEIS			
Existing (at time of 2020 SEIS)	380,000		380,000
Planned	130,000	373,000	503,000
Sum	510,000	373,000	883,000

Changes relative to 2011 FEIS	**Upper** [sqft]	**Lower** [sqft]	**Sum** [sqft]
Changes in sqft	(42,000)	36,000	(6,000)
Changes in %	-8%	10%	-1%

2.10 Project Schedule and Milestones

Section 2.7 of the 2011 FEIS described the project schedule and site development milestones.

The 2011 FEIS anticipated that site development would progress at approximately 40,000 sqft of buildings per year. The anticipated completion of the development of the entire KLIP was therefore estimated around the year 2025.

The actual progress of the site development has been slower than anticipated in the 2011 FEIS. This will put the now anticipated completion of the development further into the future than described in the 2011 FEIS.

As was already described in the 2011 FEIS, four major work categories occur for the construction of individual warehouses:

- **Detailed grading** of building footprint and adjoining land: Establishing the finished grade for the buildings and the surrounding traffic areas, parking areas and open space.
- **Foundation**, paving and drainage systems: Installing the foundation for the structures, paving of the parking and traffic area around the buildings and connecting the site drainage system to the overall development stormwater system.
- **Construction** of steel structure and roof: Construction of the outer building envelope.
- **Completion of internal core and shell facilities:** Carrying out all internal building work required for the core and shell building facilities.

In addition to the work categories for individual warehouses the following work will be required for the development of the entire site:

- **Mass grading:** Suitable fill, which will be brought to the site, will be distributed on the site to achieve the desired finish grade. Phasing of grading will be done so that a limited grading area will be exposed to soil erosion. In the areas that are not under actively grading, temporary soil stabilization would be applied for the period between major grading phases. Detail of the requirement for mass grading will be delineated in the grading permit.
- **Construction of the site perimeter berms:** The berms will be installed in conjunction of the mass grading. It would be desirable to establish the vegetation on the berms, especially the planting of taller trees and shrubs for visual impact mitigation, early in the grading process so that the trees have time to grow.
- **Installing the storm water system:** The storm water treatment and management system will serve the completed buildings and adjacent impervious areas. During construction, the stormwater system would have to be protected against entrained soil and the associated construction related runoff.
- **Installing the wastewater system:** The wastewater generated at the site will have to be treated onsite since the site is presently not connected to the municipal sewer system, nor are there plans to install a sewer system for facilities in the Kapa'a Valley. The type of wastewater treatment technology which would be used for yet to be installed wastewater units is more advanced than the preferred treatment technology described in the 2011 FEIS. The proposed

wastewater units would serve multiple buildings and dispose the treated wastewater in infiltration fields at the site perimeter.

- **Installing other utilities:** Electricity and water supply to the site will be below ground within the site boundaries.
- **Traffic areas and road access:** Traffic and parking areas inside the site will be paved areas between buildings and inside the perimeter berms. There will be one roadway access to the Kapa'a Quarry Place.

Section 2.7 of the 2011 FEIS described the project schedule and major project milestones and presented the project schedule in Table 2-8 of the 2011 FEIS. The progress of site development work has been slower than anticipated as disclosed in the 2011 FEIS. Table 2.10.1 shows the updated project schedule with a projected completion of the development of the KLIP, based on a conservative estimate, in 2031.

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	**Description**	**Projected Completion per 2011 FEIS** [year]	**Updated - Expected schedule** Start [year]	End [year]	**Notes for SEIS**
1	Completion of the environmental review process:	2011	2020	2021	EIS process completed in 2011 - SEIS started in 2020
2	Application for Zone Change:	2011			Completed
3	Special Management Area (SMA) permit:	2011	2014	N/A	Initial SMA Use permit obtained - Outstanding minor modification acceptance pending in 2020
4	Start of construction for proposed KLIP in Upper portion of the site	2011	2011	N/A	The construction in the Upper site started some 30 years ago; construction activities following acceptance of the 2011 FEIS started in 2011
5	Continuous addition of warehouses in the Upper portion of the site:	2017	2011	2022	Anticipated full buildout of Upper site is 2022

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	Description	Projected Completion per 2011 FEIS [year]	Updated - Expected schedule Start [year]	End [year]	Notes for SEIS
6	Start construction vegetative buffer zones around the Lower portion of the site	2012	2021	2022	Start of perimeter berm construction will be after SMP minor modification is obtained
7	Mass Grading of Lower site	2015	2018	2023	Mass grading has already started under an existing grading permit with Lower finish grade elevations
8	Soil stabilization in Lower portion of the site	2015	2019	2023	Temporary soil stabilization will occur between grading phases, with final stabilization at completion of work.
9	Detailed grading for warehouse construction in Lower portion of the site	2016	2023	2028	Detail grading is following mass grading and is limited in scope of soil disturbance.
10	Electric and water infrastructure installation Lower portion of the site	2016	2023	2026	Electric and water electric and water supply infrastructure installation will be below ground.
11	Onsite wastewater systems Lower portion of the site	2016	2023	2026	There will be a central infiltration field for the treatment units.
12	Installation of paved roadways Lower portion of the site	2016	2023	2026	The roadway and off-street parking pavement will be connected
13	Installation of the stormwater drainage system Lower portion of the site	2016	2023	2028	The installation of the storm water systems will be done in three phases, in accordance with completion of warehouses.
14	Completion of all the warehouses in the	2016		2022	The completion of the warehouse development in

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	Description	Projected Completion per 2011 FEIS [year]	Updated - Expected schedule Start [year]	End [year]	Notes for SEIS
	Upper portion of the year:				the Upper site is slated for 2022.
15	Start of construction of warehouses in Lower site in	2017	2023		The start of warehouse construction in the Lower site is contingent on the completion of the site development phase, including grading, traffic areas, site infrastructure
16	Continuous addition of warehouses in the Lower portion of the site:	2017 to 2025	2023	2031	A duration of 8 years is conservative estimate of the length of construction of warehouses in the Lower site.
17	Completion of the development	2025		2031	The expected completion of the site development is slated to completed by 2031.

2.11 Sustainable Design Approach for the Lower Portion of the Site

Section 2.8 of the 2011 FEIS described the plans of the Applicants to use sustainable site and building technologies in the development of the Lower portion of the project site. The commitment to use sustainable site development strategies is consistent with the need for effective impact mitigation measures in the part of the site that is adjacent to environmentally sensitive land, especially adjacent aquatic resources.

The 2011 FEIS described plans of the Applicant to develop the Lower site to strategies that are following strategies of the LEED green building standard. The LEED green building standard provides guidelines to mitigate impacts from the built environment, including impacts from buildings consuming energy and water and from infrastructure emitting storm water runoff, wastewater, and other emissions. The standard also addresses impacts and impact mitigation strategies related to traffic and other issues which concern the community, including climate change.

As Section 2.8 of the 2011 FEIS described, by developing in accordance with the LEED, priority was given to satisfy those LEED credit categories which would provide effective impact mitigation for the proposed site. More specifically, from the seven LEED credit categories, two categories, the water efficiency category (WE) and the sustainable site category (SS), were given special attention since they directly

provide the type of impact mitigation that is most important for adjacent aquatic resources, especially the Kawainui Marsh.

The LEED green building standard under which the project is currently developed has the following seven categories:

SS - Sustainable Sites
WE - Water Efficiency
EA - Energy & Atmosphere
MR - Materials & Resources
IEQ - Indoor Environmental Quality
ID - Innovation in Design
RP - Regional priority

The actual measures to be implemented in the updated site development plan will be somewhat different from the sustainable strategies described in the 2011 FEIS. The reason is that the LEED standard is evolving and may require more stringent measure than considered before in the 2011 FEIS.

SS - Sustainable Sites Credit Category: The proposed site is within the State of Hawaii "Urban" land use district and is not a greenfield development. The proposed project will be developed on an area that was formed by landfill. The project therefore meets the goal to conserve previously undeveloped and open land. Land that is either zoned for industrial use or is qualified for converting the industrial zoned land is in short supply in the greater Kailua and Kaneohe region, and consequently the region will benefit from developing land for industrial use at the proposed site.

The mitigation measures under the sustainable sites category that are of significance to the planned site development are as follows:

- Alternative transportation is supported by providing incentives for bicyclists and providing preferred parking for low emitting vehicles and carpools. The goal of this measure is a reduction of individual traffic to and from the project site.
- Constructing a restored habitat on the site perimeter berms by planting native or adaptive plants. This measure will reduce the visual impact on the project and will reduce air pollution and noise propagation to adjacent areas. The new vegetated areas at the site perimeter will receive irrigation water from harvested rainwater and possibly recycled wastewater.
- A comprehensive storm water treatment system will be installed that will control the quality and quantity of the stormwater runoff from the developed site. The storm water treatment and management system will be designed to treat 100% of the runoff before releasing it to the receiving water in the Kapa'a Stream corridor. The goal of this measure is to Lower the impact of storm water to the adjacent aquatic resources from the existing conditions.
- Strategies to reduce light pollution by controlling internal and external light sources within the development will be implemented during nights. This measure will provide important impact mitigation since excessive light can impact the wildlife and migrating birds in the adjacent marsh. A light pollution prevention plan that was required by the conditional zone change was developed and was approved by the Accepting agency.
- Binding guidelines for internal build-out of leased spaces, following sustainable and green practices will be contractually required by the tenants.

WE - Water Efficiency Credit Category: The proximity of the proposed site to important wetland areas emphasizes the high importance of effective mitigation measures for all water related issues. Water relevant issues include stormwater runoff, water use for irrigation, water use in the buildings and wastewater treatment and disposal. While the stormwater control will be treated under the Sustainable Site credit category all the remaining water related credits are grouped under the Water Efficiency credit category. The Water Efficiency (WE) credit category uses the following measures to mitigate impacts of the project:

Water efficient landscaping will be applied through using native and adaptive plants and irrigation with harvested rainwater. Native and adaptive plants have Lower needs for irrigation water, pesticides and fertilizers then introduced plant species. This measure reduces the amount of fertilizer and pesticides which might be entrained in the runoff from landscaped areas. Recent changes: Under the updated site development plan, several vegetated buffer strips will use turf grass as the vegetation cover for the retention of stormwater runoff pollutants. Turf grass typically has higher water demand but has the advantage of being effective for the filtering function of the vegetated buffer strip.

Innovative wastewater technologies will include advanced onsite treatment systems that go far beyond the performance and effectiveness of conventional septic systems. Wastewater is treated onsite because there is no connection to the municipal sewer system. Since the discharge of treated wastewater occurs near important wetlands, advanced treatment steps are added to the septic systems on the site. Aerobic and anaerobic treatment process steps are added to the septic systems to remove significant organic loads and suspended solids. The treatment process also will significantly reduce nutrients from the wastewater before the treated effluents is infiltrated at the site perimeter or in infiltration fields. Recent changes: The wastewater technology disclosed in the 2011 FEIS was a recirculating filter technology. While this technology was already more effective in removal of organic and nutrient loads than conventional septic systems, the new technology planned under the updated site development is the membrane bioreactor (MBR) system. A wider application of the MBR technology is evolving in the US since it offers low residual pollution in the treated effluent and significantly reduces infiltration fields. With the benefits come higher first costs and O&M costs. The first two MBR units are presently being tested in the Upper site under a pilot project that is conducted in cooperation with the Hawaii State Department of Health. Once the pilot project is satisfactorily concluded, the rest of the KLIP will be equipped with this technology. All new onsite wastewater units will use MBR technology and existing conventional septic systems will be refitted with MBR technology when required.

Water use reduction measures will result in a 30% - 40% water use reduction relative to the applicable benchmark standards that were described in the 2011 FEIS. Water reduction measures helps reducing the burden of the project on the municipal water supply and reduces the amount of wastewater generated inside the buildings.

EA - Energy & Atmosphere Credit Category: Measures under the energy and atmosphere credit category will help to reduce energy consumption and therefore will mitigate impacts related to responsible resource consumption. Changes: In the years since the 2011 FEIS the contribution of renewable energies has significantly increased in Hawaii. In 2020 a new energy conservation code (IECC 2015) became mandatory in Hawaii which greatly increases the energy conservation effort. Energy

conservation as well as renewable energies will help the State of Hawaii on its declared effort achieve the clean energy goals. The relevant LEED credits are as follows:

- Optimized energy performance of lighting and other building equipment will save around 30% of the energy costs of an applicable baseline. This measure helps to reduce the burden of the proposed project on the electric supply system and helps reducing burning fossil fuel for electricity generation. Reducing carbon is an important contribution to mitigate effects of climate change.
- Onsite renewable energy will offset energy derived from imported fossil fuel, especially oil. The onsite renewable energy will be derived from solar thermal/waste heat recovery and/or PV energy systems. This measure helps to reduce the burden of the proposed project on the electric supply system and helps to reduce burning fossil fuel for electricity generation.
- Continuous measurement and verification will support the KLIP management as well as tenants to monitor the success of energy savings and intervene if the saving goals are not met.

MR - Materials & Resources: The materials and resources credit category addresses island-wide concerns, since it combines efforts to divert as much construction waste as possible from going to landfill, and to conserve virgin material by reusing and recycling waste. In addition, the credit category advocates the use of locally extracted or manufactured materials in lieu of imported material. The relevant credits that have been chosen for the of the project include:

- Construction waste management will be performed to reuse or recycle construction waste and therefore reduce disposal in landfills.
- Recycled materials will be used in the construction and products will be given preference that have a higher percentage of pre- and post-consumer recycled content. Regionally extracted or manufactured material will be used to support indigenous resources and the economy of Hawaii. These measures will help the environment and help the local economy.

IEQ - Indoor Environmental Quality: The Indoor environmental quality credit category addresses concerns about a healthy indoor environment for building occupants. IEQ impacts and their mitigation have only secondary significance to the exterior environment. In selecting what credits will be attempted, the project endeavors to create synergy between increasing the indoor environmental conditions and to mitigate impacts to the exterior environment. The relevant credits that also mitigate pertinent impacts on the adjacent environment of the proposed project are as follows:

ID - Innovation in Design: The Innovation in Design credit category includes measures to step outside the conventional design paradigm and implement mitigation measures more than the basic LEED credit requirements or use innovative project initiatives that create effective synergies to make the project "more green".

For the project, the Innovations-in-Design issues will include advanced storm water treatment and wastewater treatment, both of which will goes beyond conventional technology application. Furthermore, the Applicants are working with local environmental groups which promote environmental education.

RP - Regional priority: The credits of the regional priority category represent bonus points for the project to implement those credits that are most attractive to the region. These issues include energy consumption, storm water management, wastewater management and locally derived or recycled materials.

CHAPTER 3 - CURRENT ENVIRONMENT

The project site is located on the windward site of the Island of Oahu. The project site is composed of two contiguous land parcels, TMK 4-2-15:013 and 014, both owned by the Applicants, in the Lower stretches of the Kapa'a Valley, directly adjacent to the H3-Freeway and the Kapa'a Quarry Road. The environmentally and culturally important Kawainui Marsh is located to the east and adjacent of the project site. Figure 3.1 shows the vicinity map of the project site. The following sections evaluate and discuss the existing environment at the proposed project site.

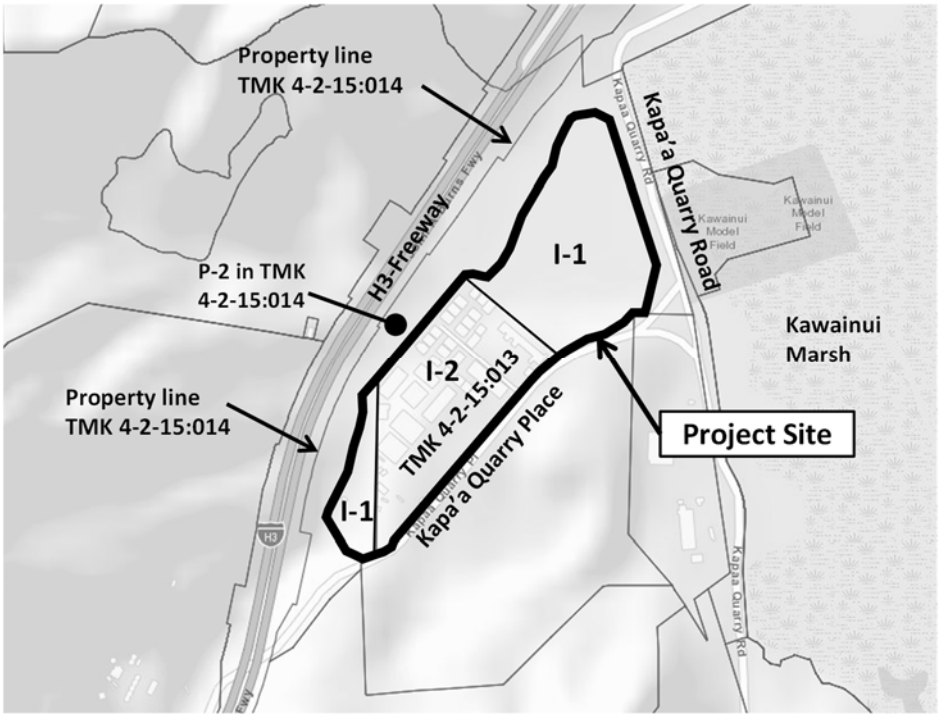


Figure 3.1: Project Site – Vicinity Map

The project site stretches over portions of parcels TMKs 4-2-15:013 and 014. While the project site within TMK 4-2-15:014 was rezoned to I-1, the remainder of the parcel 4-2-15:014, remains open land zoned as P-2.

3.1 Geology, Topography, and Soils Existing Environment

Section 3.1 of the 2011 FEIS described the geology, topography, and soils at the project site.

3.1.1 Geology and Topography

Section 3.1.1 of the 2011 FEIS described the existing geology and topography at the project site. The basic geology at the project site has not changed. Although some grading has been done at the project which affected the site topography, the basic topography remains essentially unchanged.

The Kapa'a Light Industrial Park site is situated in the Kapa'a valley, flanked by the Ulumawao mountain ridge in the southeast and the Mahinui mountain ridge in the northwest. The geological formations of the hills surrounding the valley are mainly defined by very dense rock formations of volcanic origin. A geologic map of Oahu depicted in Figure 3.1.1.1 shows that at higher elevations, the geology is mostly defined by volcanic rock of Kailua volcanic series characterized by massive basaltic flows which contain numerous dike structures filled with secondary minerals. In contrast, in the proposed project site,

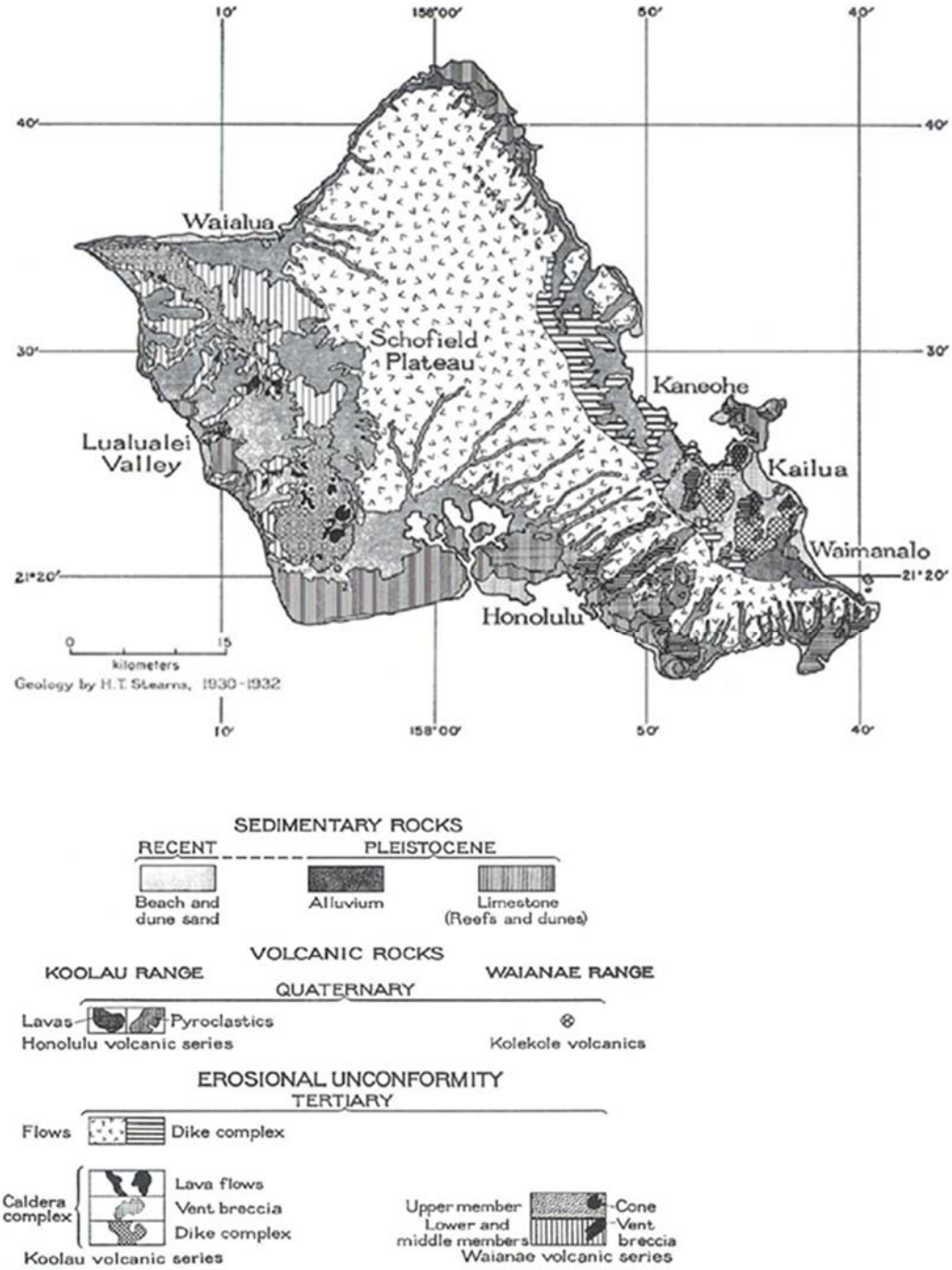


Figure 3.1.1.1: Main geological formations of Oahu (source 2011 FEIS Figure 3-2)

located in the lower reaches of Kapa'a Stream, the geology is defined by terrigenous alluvium and fine organic mud. In this Lower part of the watershed much of the surface has been impacted by quarry and land filling operations, which have resulted in deposits of more than 20 feet of quarry tailings and municipal solid wastes.

Before the development of the project started the original topography was characterized by gently sloping terrain from southwest to the northeast and towards the Kapa'a Stream. The original topography at the site was heavily impacted by quarry and landfill operations spanning from the 1950's through the 1970's.

The topography at the project is characterized by the relatively flat section of the Upper site separated from the Lower section by a narrow-sloped section with an average 35-foot drop. Ground elevations in the Upper section of the site range from 83 to 95 feet above Mean Sea Level (MSL), and gently slope towards the Kapa'a Stream. The Lower section of the site is formed by a relatively flat plateau bounded in the North by Kapa'a Stream and in the East by a drainage ditch which runs along Kapa'a Quarry Road and drains into the stream. Ground elevations in the Lower site range between 20 and 50 feet above MSL with a gentle slope in the easterly direction.

While the topography of the Upper site has basically remained the same as described in the 2011 FEIS, the topography of the Lower site has changed due to site grading work that started in 2015, after the initial SMP (2014/SMA-27) was approved. The topographic map of the proposed site is depicted in Figures 3.1.1.2 and 3.1.1.3, for the current topographies of the Upper and the Lower portions of the project site, respectively.

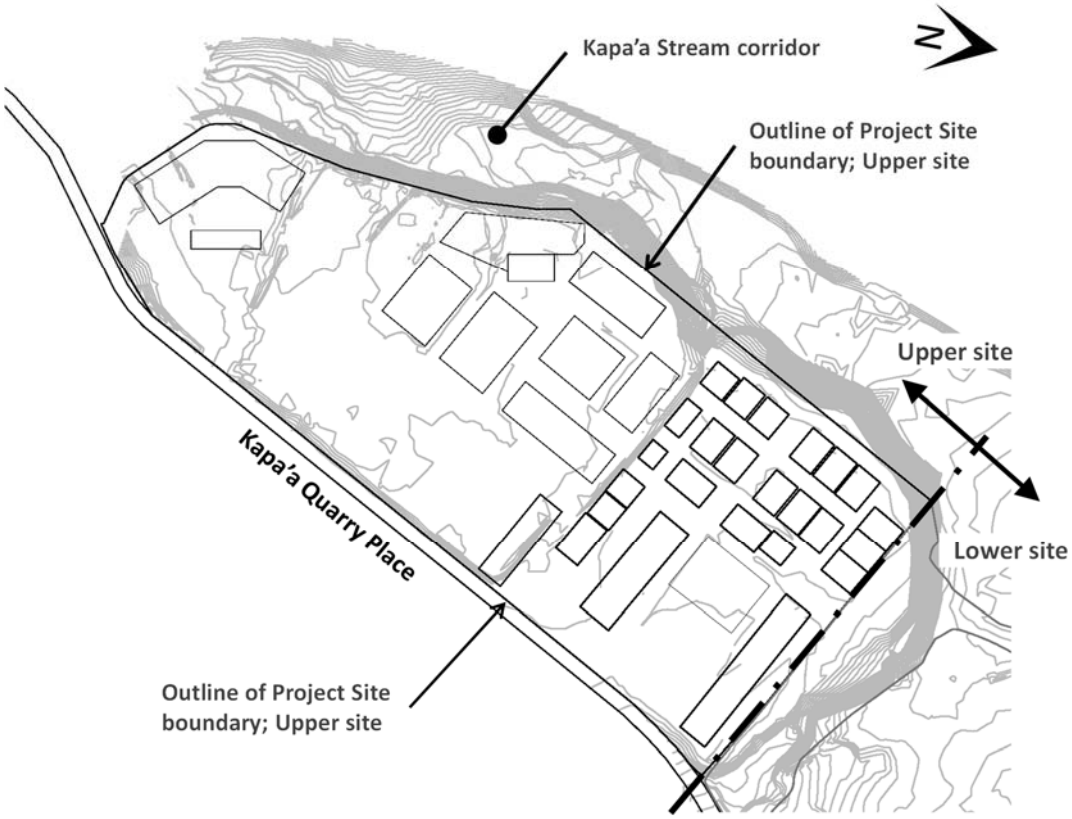


Figure 3.1.1.2 Current topography of the Upper site

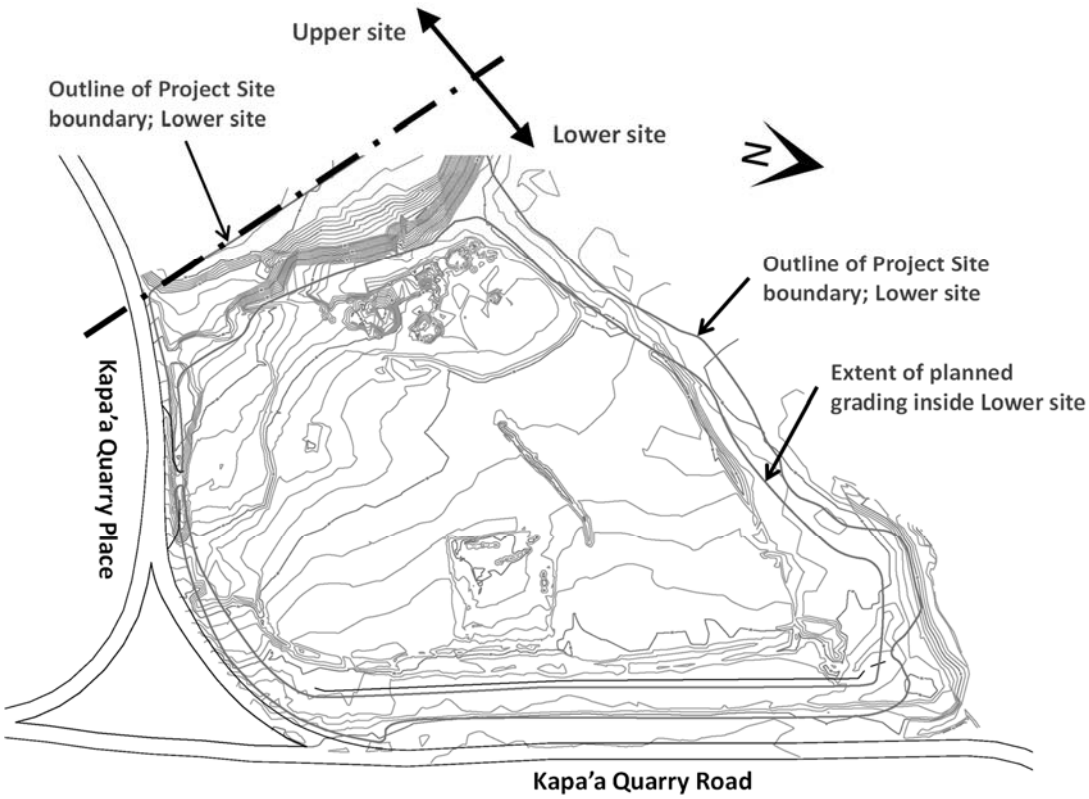


Figure 3.1.1.3 Current topography of the Lower site (note the image shows the last topographic survey conducted in 2017)

3.1.2 Soils

Section 3.1.2 of the 2011 FEIS described the soils found at the project site. The team concluded that soils have not changed since the 2011 FEIS was approved.

A description of the soils within the project area was obtained by using the web Soil Survey of the U.S. Natural Resources Conservation Service (NRCS). (http://websoilsurvey.nrcs.). The soil map obtained represents an area dominated by one or more major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soils. In the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all-natural phenomena. Soils with profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in the texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics.

The following soils are represented at the proposed site:

ALF—Alaeloa silty clay:

Parent material: Basic igneous rock

Properties and qualities; Slope: 15 to 35 percent; depth to restrictive feature > 80 inches; Well drained; Permeability moderately low to moderately high (0.06 to 0.20 in/hr.); depth to water table > 80 inches

KlaB—Kawaihapai stony clay loam:

Landform: Alluvial fans; Parent material: Basic igneous rock

Properties and qualities: Slope: 2 to 6 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability moderately high to high (0.60 to 6.00 in/hr); depth to water table > 80 inches; Occasional flooding; no ponding.

Ph—Pearl Harbor clay

Landform: Coastal plains; Parent material: Alluvium

Properties and qualities: Slope: 0 to 2 percent; depth to restrictive feature > 80 inches; Poorly drained; Permeability Very low to moderately low (0.00 to 0.06 in/hr); depth to water table: About 18 to 48 inches; occasional flooding: frequent ponding.

QU—Quarry:

No description for generic quarry soil

rSY—Stony steep land:

Landform: Valleys; Parent material: Mass movement deposits

Properties and qualities; Slope: 40 to 70 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability High (2.00 to 5.95 in/hr); Depth to water table > 80 inches; no flooding; no ponding.

Table 3.1.2.1 shows the areas of representative soils for the three contiguous land parcels (TMK 4-2-15:001 (portion of), 006 and 008), within the development boundary of the Upper portion of the project site (development TMK 4-2-15:001 (portion of), 006 and 008) and within the development boundary of the Lower portion of the project site (TMK 4-2-15:006). The intensive quarry and landfill operations in the area dating back to early 1950s have resulted in significant changes from the original soils at the site. Extensive deposits of quarry tailings and overburden materials, as well as residential solid wastes, have significantly changed the original soils at the site.

Table 3.1.2.1 Areas of representative soils for the three contiguous land parcels (source Table 3-1 of 2011 FEIS)

Map symbol	Map unit name	Three parcels of site TMK 4-2-15:001 (p.o.), 006 & 008		Upper portion of the site TMK 4-2-15:001 (p.o.) & 008		Lower portion of the site TMK 4-2-15:006	
		acres	% of total	acres	% of total	acres	% of total
AFL	Alaeloa silty clay	1.1	1.3%	0.0	0.0%	0.0	0.0%
KlaB	Kawaihapai stony clay loam	19.2	24.3%	4.4	16.2%	0.3	1.0%
Ph	Pearl Harbor clay	30.0	37.9%	0.2	0.6%	20.9	85.6%
QU	Quarry	11.4	14.4%	10.7	40.1%	0.6	2.4%
rSY	Stony steep land	17.5	22.1%	11.5	43.0%	2.7	11.0%
	sum	79.2	100.0%	26.8	100.0%	24.5	100.0%

3.2 Water Resources Current Environment

Section 3.2 of the 2011 FEIS described existing aquatic resources at the project site. Some of the basic parameters of the aquatic resources described in the 2011 FEIS must be updated based on information acquired or observations made subsequently of the 2011 FEIS.

The following sub-sections provide a description of the general conditions and characteristics of water resources found at the project site. Types of water resources investigated include surface water, wetlands, floodplains, watershed considerations and current stormwater management.

3.2.1 General Climate and Rainfall

Section 3.2.1 of the 2011 FEIS described the general climate and rainfall at the project site. While the general climate information is still valid a new rainfall estimate was used for this Draft SEIS. The site of the Kapa'a Light Industrial Park is located on the windward side of Oahu, approximately one mile from the ocean. Except for a few months in the winter, like most areas of windward Oahu, the climate in the project area is characterized by its elevation above sea level, distance from the ocean and exposure to the prevailing trade winds. The general climate is sunny and relatively uniform year-round. Day time temperatures range between 73 to 80 °F, whereas at night the temperatures can dip into 60's °F.

Figure 3.2.1.1 shows the annual distribution of mean monthly precipitation values at the project site. The Figure is based on data obtained from the Rain Atlas of Hawaii (UHM, 2011). Figure 3.2.1.2 shows the rainfall map of Oahu, showing the annual precipitation rates. The map depicts the spatial distribution of mean annual precipitation on Oahu. The figure indicates mean annual precipitation for the Koolau Poko region ranging between 60 and 120 inches. Higher rainfall occurs in higher elevations of the Ko'olau range due to orographic lift caused by the Koolau mountain ranges. The rainfall at the project site is due mostly to non-thermally induced trade wind showers or large weather systems over the entire island. Figure 3.2.1.2 indicates the mean annual rainfall at the project site is around 50 inches.

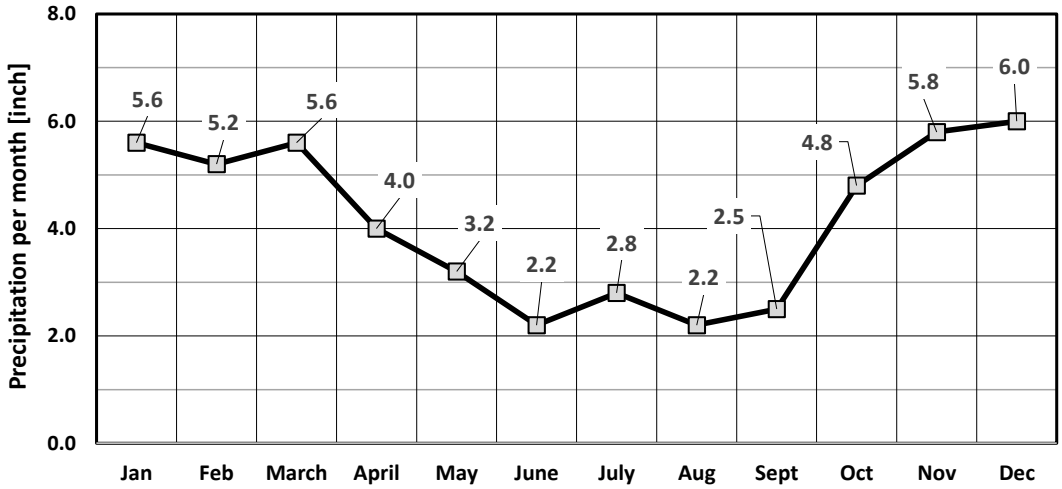


Figure 3.2.1.1: Annual rainfall at the project site

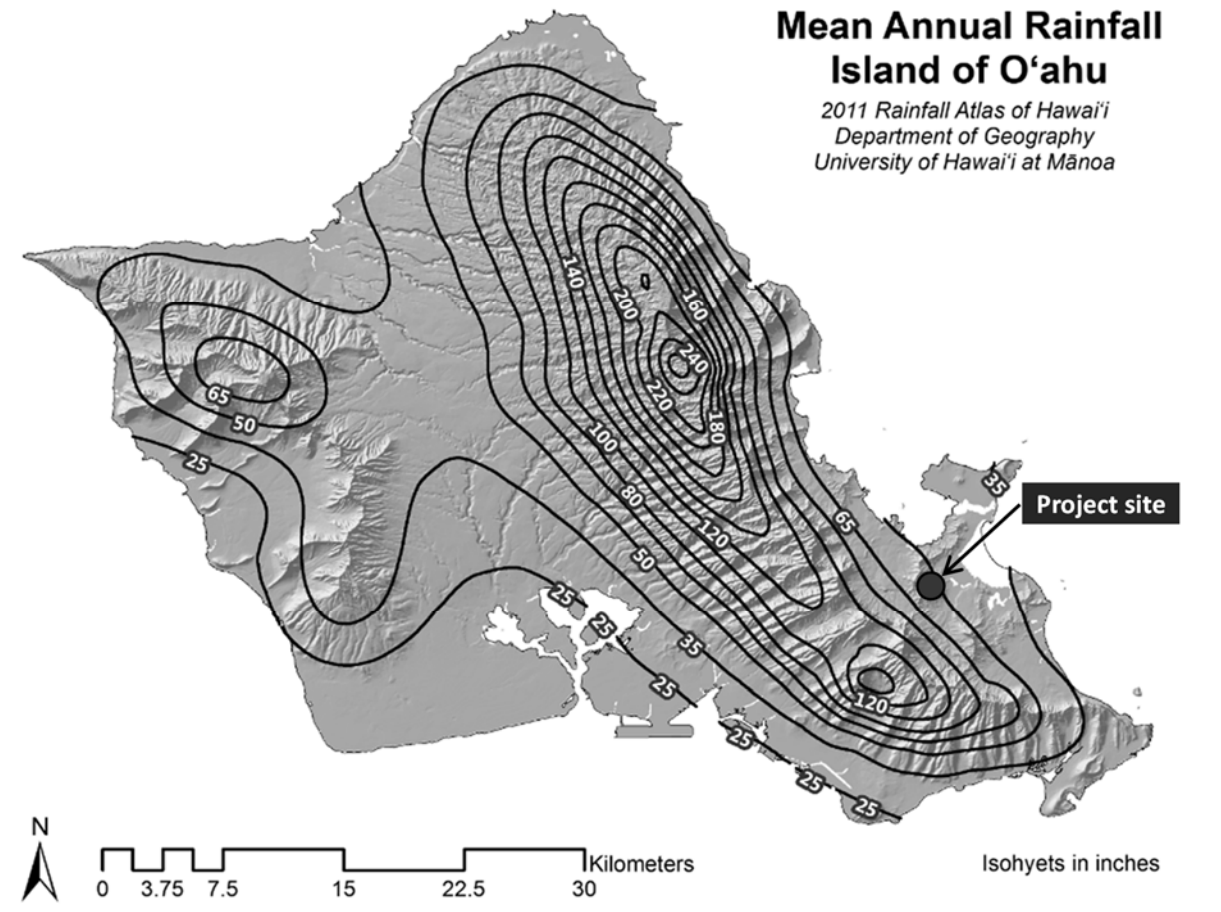


Figure 3.2.1.2: Annual distribution of mean monthly precipitation values

3.2.2 Surface Waters

Section 3.2.2 of the 2011 FEIS described four main surface water features on or adjacent to the project site.

There are four main surface water features on or adjacent to the project site. Except for drainage culvert discharging to a percolation field on the site, all the surface water features are outside the development boundary and are therefore not directly affected by the proposed action. The four identified main surface water features are as follows:

1.Kapa'a Stream: The relatively short Kapa'a Stream is the main drainage way for the Kapa'a Valley watershed. The stream drains into Kawainui Marsh and ultimately to the Pacific Ocean via Oneawa Canal and Kailua Beach. The stream's total length is approximately 1.9 miles, of which the stream flows through the property of the Applicants for 0.7 miles. As reported in the 2011 FIS the average base flow at the confluence of the stream with the Kawainui Marsh is 1.2 cbft/sec during the wet season (Nov. 1 to April 30) and .9 cbft/sec during the dry season (May 1 to Oct. 30). During the rainy

season and after heavy storms, the base flow increases significantly and during rare storm events, the stream level raises high enough to inundate the quarry road in the vicinity of the culvert under the quarry road. Kapa'a Stream is on the List of Impaired Waters of Hawaii. The list was prepared under provisions of the Clean Water Act §303(d). The Kapa'a Stream exceeds the dry season turbidity standard and nutrients; where turbidity, suspended solids and metals are stated as predominant pollutants. Figure 3.2.2.1 shows the lower reaches of the Kapa'a Stream with the only wider perennial stream sections (just upstream of the culvert under the quarry road through which the stream flows into the Kawainui Marsh). For a significant part of the year the stream is covered with Salvinia Molesta and has none, or small patches of free water surface. Recent observations have shown that the Kapa'a Stream is covered also with other vegetation, such as tall grasses which penetrate the free water surface.

Figure 3.2.2.1: Lower Reach of Kapa'a Stream corridor covered with salvinia molesta.

(source Figure 3.9 of the 2011 FEIS)

2. Wet land area: An area of about 10 acres within the parcel TMK 4-2-15:014 can be described wetland following the criteria of wetland soil, vegetation, and flooding conditions. The wetland area is adjacent to the Lower portion of the project site. At present, the wetland area has a dense cover with California grass and no apparent larger open water surfaces.

3. Drainage ditch along Kapa'a Quarry Road: There are two drainage ditches along a section of Kapa'a Quarry Road which is immediately adjacent and to the Eastern perimeter of the Lower site, one on each side of the quarry road. Only the mauka (e.g., on the mountainside) drainage ditch is considered at this point. The mauka drainage ditch is typically stagnant water, which originates from surface runoff and seepage of water from the Lower portion of the proposed site. For much of the year the ditch is completely covered with algae and/or water plants.

Figure 3.2.2.2 shows the drainage ditch on the mauka side of the quarry road around 2010, as described in the 2011 FEIS. In Figure 3.2.2.2 the drainage ditch is shown with a continuous cover of Salvinia Molesta (green water plants floating on the water surface). At that times it was observed that during severe stormwater events the drainage ditch would convey storm water runoff to the Kapa'a Stream and subsequently into the Kawainui Marsh.

Figure 3.2.2.2: Existing drainage canal alongside Kapa'a Quarry Road

The photo shows the mauka (mountainside) drainage ditch along the Kapa'a Quarry Road around 2010.

Figure 3.2.2.3 (a) through (d) show the drainage ditch around 2008. Figure (a) indicates the locations and views of the photos in Figures 3.2.2.3 (b) though (d). Free surfaces are noticeable on drainage ditches on both sides of the quarry road.

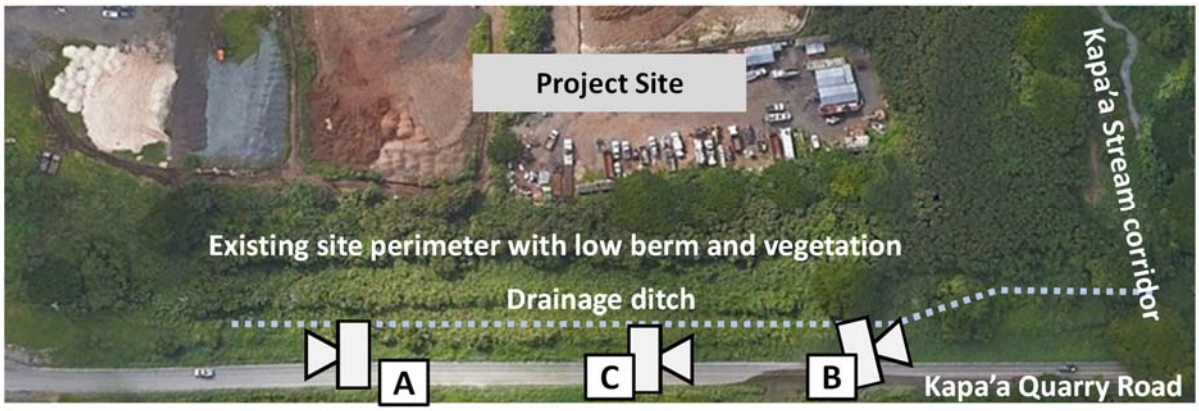


Figure 3.2.2.3 (a): Locations and orientations of views (A) through (C) in Figure 3.2.2.3 (a) through (c)

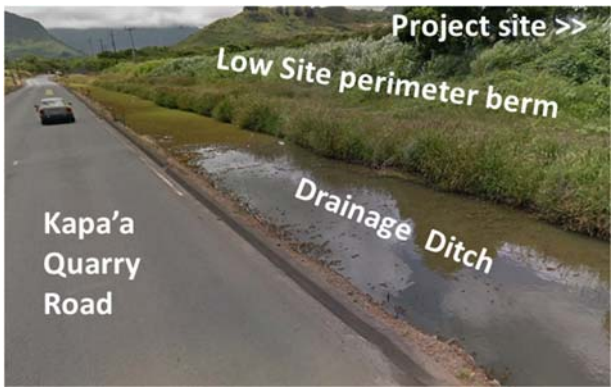


Figure 3.2.2.3 (b): View A of the drainage ditch on the mauka side of the quarry road. Photo describes condition in the year around 2008.

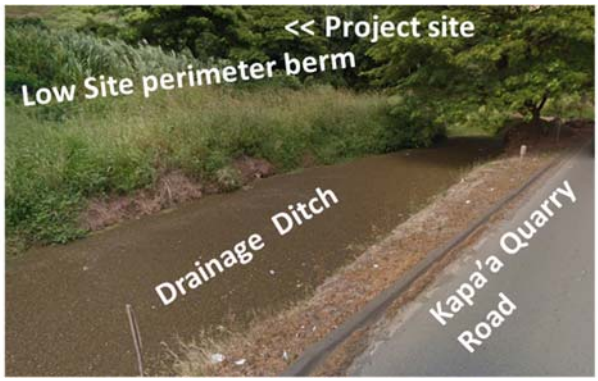


Figure 3.2.2.3 (c): View B of the drainage ditch on the mauka side of the quarry road. Photo describes condition in the year around 2008.

Figure 3.2.2.3 (d): View A of the drainage ditches on both side of the quarry road. The project site is to the left of the road. Photo describes condition in the year around 2008.

In the years following the 2011 FEIS, the stream bed conditions of the drainage ditch changed significantly. Figures 3.2.2.4 (b) through (d) show three views of the conditions of the drainage ditch in early 2020. At present the mauka drainage ditch can hardly be distinguished from the surrounding dense vegetation. A site visit in early 2020 revealed that the drainage ditch basically has ceased to exist with soil accumulated and dense vegetation growing in the area that was once a free surface.

The changed conditions of the drainage ditch with a dense vegetation cover and a former stream bed filled with soil have significant effects on the drainage capability of the ditch. It has been observed that during strong storm events water accumulates on the quarry road, creating traffic hazards.

Comments received regarding the DSEIS addressed several aspects of the drainage ditch. Some comments called for a redevelopment of the areas of the drainage ditch. Appendix J describes changes of the drainage ditch over a period of approximately 20 years, and provides illustrations of what changes have happened to the bed. Appendix J provides a proposed modification of the area around the drainage ditch. The proposed changes would improve the storm water situation, improve traffic safety on the adjacent Kapa'a Quarry Road, and provide room for the installation of a pathway for pedestrians and bicyclists.

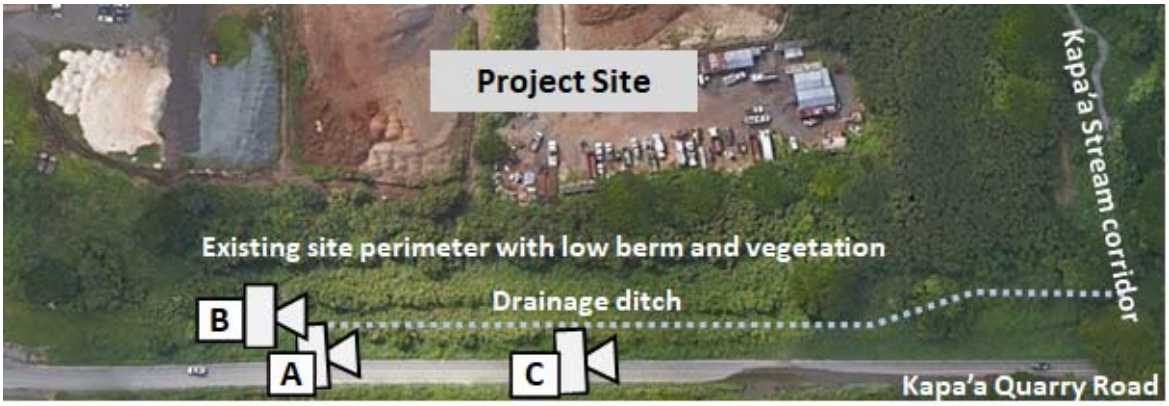


Figure 3.2.2.4 (a): Locations and orientations of views (A) through (C) in Figure 3.2.2.3 (a) through (c)

Figure 3.2.2.4 (b): View A of the drainage ditch on the mauka side of the quarry road. Photo describes condition early in 2020.

Figure 3.2.2.4 (c): View B of the drainage ditch on the mauka side of the quarry road. Photo describes condition early in 2020.

<<< Figure 3.2.2.4 (d): View A of the drainage ditches on both side of the quarry road. The project site is to the left of the road. Photo describes condition early in 2020.

4. Vegetated swale along Kapa'a Quarry Place with discharge on to the Lower site: The drainage flow in the vegetated swale along the Kapa'a Quarry Place roadway enters the Lower portion of the project site through a culvert under the roadway. At the time when the 2011 FEIS was approved, the storm water flowing through the culvert was released into a vegetated ditch within the Lower site at the foot of the sloped area that separates the Lower and the Upper sites. The storm water typically infiltrated

into the landfill body during average rain events. During heavy storm events the storm water would flow through the Lower site, along the sloped are that separated the Lower and Upper sites and would enter the Kapa'a Stream corridor. In 2019 a drainpipe was installed by the Applicants that captures the storm water discharge from the culvert exist and conveys it to the Kapa'a Stream corridor, thus no infiltration occurs in the Lower site.

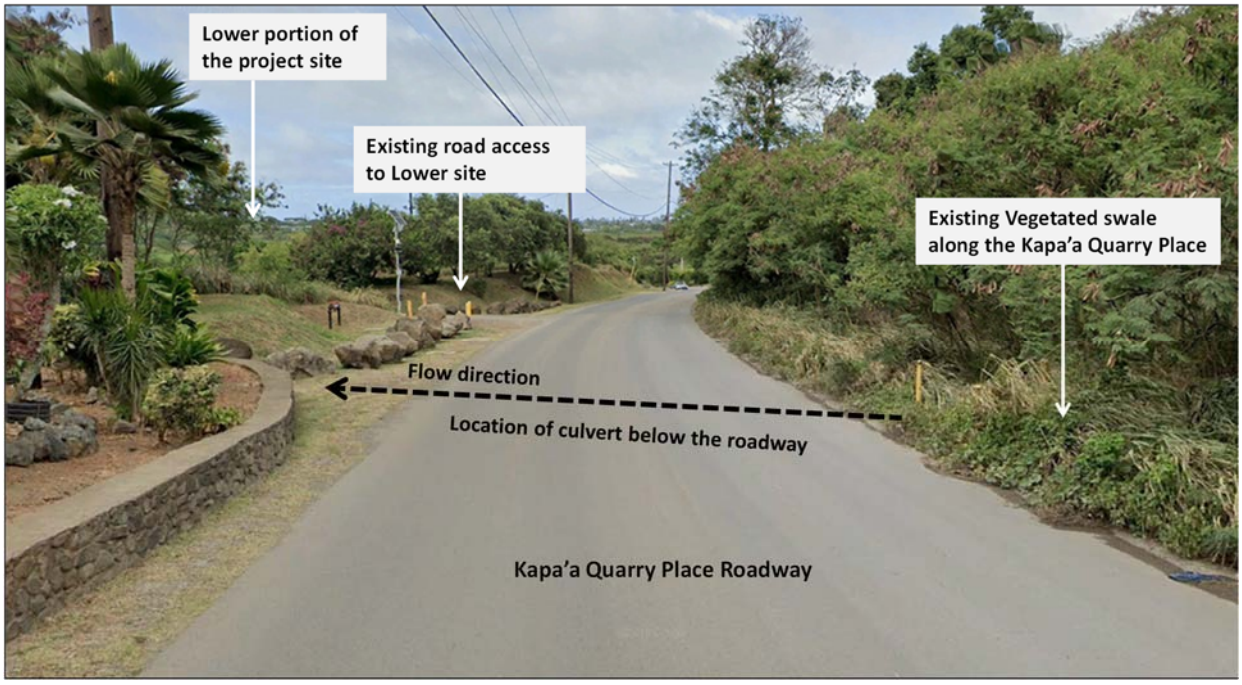


Figure 3.2.2.5: View of Kapa'a Quarry Road looking East ; at the location where the storm water flowing in the vegetated swale enters a culvert below the Kapa'a Quarry Place roadway

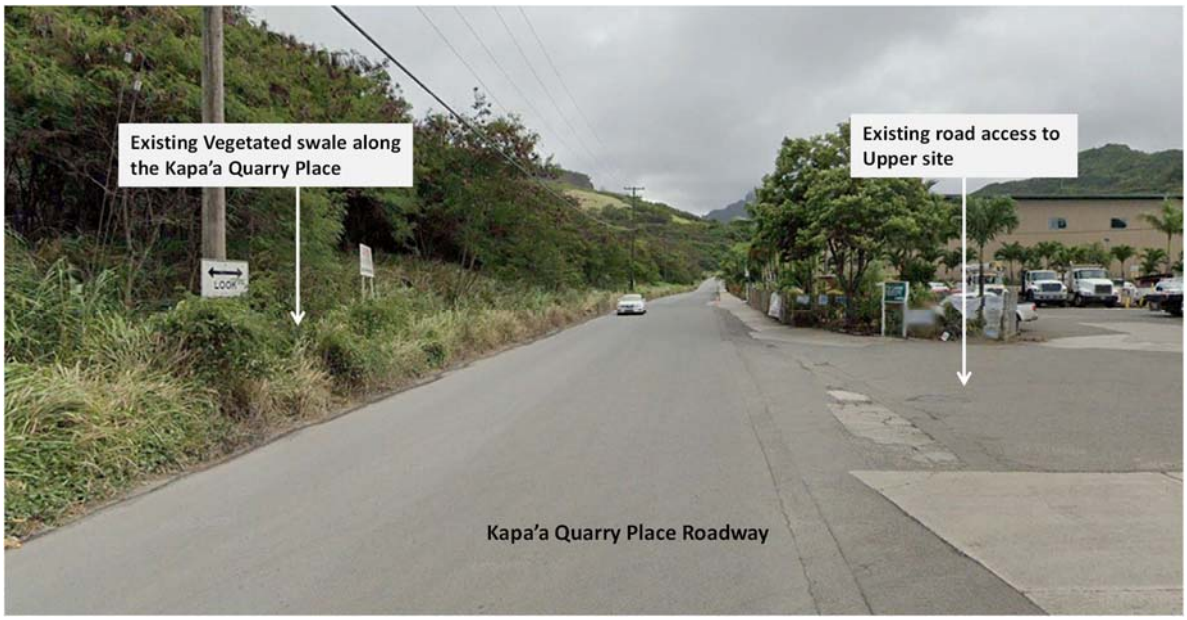


Figure 3.2.2.6: View of Kapa'a Quarry Road looking West; at the location of the existing road access to the Upper site from the Kapa'a Quarry Place roadway

3.2.3 Kapa'a Watershed Considerations

The 2011 FEIS described consideration of the Kapa'a Stream watershed in respect to the project site.

The 2011 FEIS described a watershed model published by the Hawaii Department of Health (DoH) and the water quality consideration that were assessed in the 2011 FEIS based on the DoH model. The conditions basically have not changed since the 2011 FEIS. The only change is that the drainage of the Lower portion of the site, subbasin "K" in the DoH model, might somewhat deviate from the DoH discharge model.

The Kapa`a watershed is an area of approximately 850 acres on the windward side of the Island of Oahu. Figure 3.2.3.1 illustrates the location of the Kapa'a watershed. Figure 3.2.3.1 shows Oahu divided into six districts. Based on early Hawaiian land division and governance, the islands of Hawaii are divided into *moku*, or separate districts. Mokus are further subdivided into smaller sections called *ahupua'a,* which are fundamental unit of community subsistence and political organization. An ahupua'a basically indicates a section of land running from the mountain (mauka) into the sea (makai). With resources extending from the mountains to the ocean, an ahupua'a provided the community with the life's essentials such as wood for canoes and housing, food grown in irrigated fields in the valley and seafood obtained from the near shore waters. Streams formed the center of many ahupua'a. Streams are the most important and protected resource of the ahupua'a, revered as sustainers of life and sacred to the land. The Kapa'a watershed is in the Koolau Poko district.

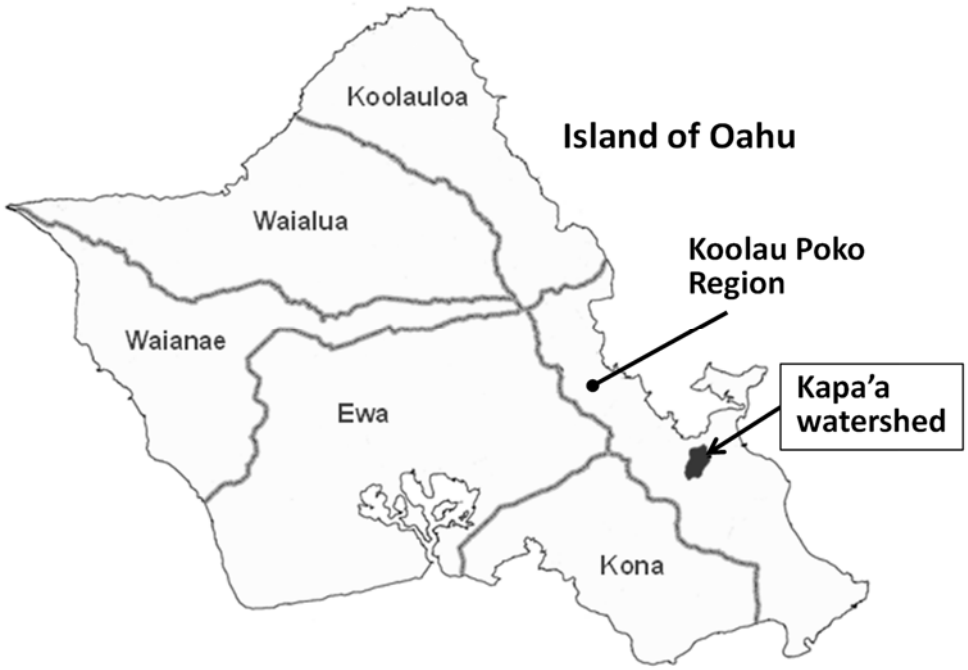


Figure 3.2.3.1 Location of Kapa'a watershed on the windward side of the Island of Oahu

(Source 2011 FEIS Figure 3-11)

The Kapa'a Stream is the main drainage pathway for the Kapa'a watershed and drains directly to Kawainui Marsh, while infiltrated water from the Kapa'a watershed drains indirectly to the marsh. The Kawainui Marsh, with a total area of about 1,000 acres, is the largest freshwater wetland in the State,

habitat for four of Hawaii's endemic and endangered water birds, and a place sacred to Native Hawaiians. Kawainui, with its adjacent Hamakua Marsh, is a designated "Wetland of International Importance".

The Kapa'a Stream has a total length of approximately 1.9 miles. Along its way through the watershed, it meanders through different parts of the Kapa'a Valley that been significantly altered by industrial and other developments in the past 60 years. From its source the stream flows through several pools until the stream enters a perennial stream section not far from where it flows into the Kawainui Marsh.

In 2007 the Hawaii State Department of Health (DoH) published an evaluation of the water quality in the Kapa'a Stream (DOH, 2007). The evaluation involved a model of the water discharge and pollutant loads of the stream, for both typical wet and dry seasons. The hydraulic model comprised 13 sub-basins, which were characterized by different hydrographical properties, drainage characteristics and land uses. The sub-basins had various sizes. With the applied assumptions of rainfall, infiltration rates, runoff rates and stream morphology assimilation rates, the sub-basins produced different flow rates and loads of various pollutants in the Kapa'a Stream. Figure 3.2.3.2 shows the extent of the Kapa'a watershed, and the location and size of the 13 sub-basins used in the DoH model.

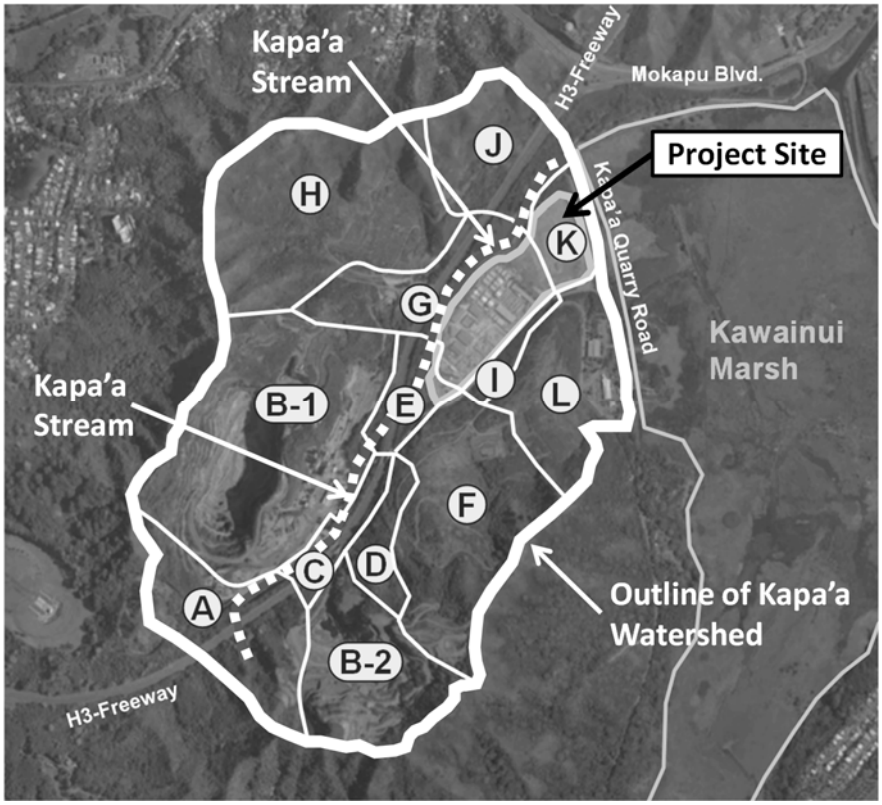


Figure 3.2.3.2 : Kapa'a Watershed with sub-basin definition for DoH 2008 hydrological model

(source 2011 FEIS Figure 3-12)

Ⓧ **Kapa'a Sub-basin of watershed area in DOH 2007 study**

Table 3.2.3.1 indicates the 13 sub-basins used in the DoH hydraulic model. In the DoH model all sub-basins, except for sub-basin L, drain into the Kapa'a Stream, where the stream discharges into the Kawainui Marsh through a culvert under the Kapa'a Quarry Road. Runoff from Sub-basin L drains directly into the Kawainui Marsh through an outlet under the Kapa'a Quarry Road. In addition to surface drainage through the Kapa'a Stream and the different direct outlets into the Kawainui Marsh, underground flow contributes to the total drainage of the watershed to the marsh.

Table 3.2.3.1 describes the subbasins in the DoH watershed model. Figure 3.2.3.2 shows the flow chart of the subbasins discharging into the Kapa'a Stream.

Table 3.2.3.1: Description of sub-basins used in DoH Kapa'a watershed model (source 2011 FEIS Table 3-2)

Sub-basin ID	**Area** (acre)	**Avg. Impervious-ness** (%)	**Description of Sub-basin**
A	96	3%	Sub-basin A is the headwater tributary drainage area for Kapa'a Stream.
B (I) and B(II)	218	9%	Sub-basin B is divided into sub-basin B(I) and B(II). The sub-basins B(I) and B(II) represent the Ameron Phase I and Phase II quarry operations. The two sub-basins are divided by the H3-Freeway. The run-off from Sub-basin B(II) is conveyed to the sub-basin B(I). Sub-basin B(I) has a retention pond that accommodates a 10-year, 24-hour rain event.
C	17	13%	Sub-basin C consists of the right-of-way for the H-3 highway and is located between the sub-basins B(I) and B(II).
D	29	3%	Sub-basin D is a steeply sloped area that drains toward the H-3 highway. Runoff from this area is collected and point-discharged into the Kapa'a Stream through a culvert.
E	24	25%	Sub-basin E is an immediate tributary drainage area for the Kapa'a Stream. The sub-basin is divided by the H3 Freeway. This sub-basin is directly to the south of the Kapa'a Light Industrial Park.
F	98	2%	Sub-basin F drains the City & County of Honolulu Kapa'a Landfill (Phase II) and relatively undisturbed slopes up to the ridgeline. Drainage is collected in a circumferential drainage swale constructed around the inner landfill. Drainage is conveyed to sub-basin E.
G	60	41%	Sub-basin G is an immediate tributary drainage area for Kapa'a Stream. The sub-basin encompasses area to both sides of the H3-Freeway and the Kapa'a Stream. Sub-basin G is divided into an eastern and western part. The western part drains through several culverts under the freeway. The eastern part includes a part of the proposed Kapa'a Light Industrial Park.

Table 3.2.3.1: Description of sub-basins used in DoH Kapa'a watershed model (source 2011 FEIS Table 3-2)

Sub-basin ID	**Area** (acre)	**Avg. Impervious-ness** (%)	**Description of Sub-basin**
H	126	1%	Sub-basin H includes the Kalaheo Landfill, which is surrounded by larger sloped scrub-covered areas. The municipal landfill is no longer in operation. The sub-basin drains into the Kapa'a Stream through a large culvert under the H3-Freeway. The sub-basin has a retention pond to control the drainage and sedimentation discharge.
I	8	23%	Sub-basin I is a small area that drains into the Kapa'a Stream through a pipe that passes under the Kapa'a Quarry Access Road and terminates in Sub-basin K.
J	59	5%	Sub-basin J drains slopes to the west of the H3-freeway and the stream valley adjacent to sub-basin K. The area west of the H3-Freeway is drained into the Kapa'a Stream through several culverts under the freeway.
K	28	2%	Sub-basin K is a landfill area that consists of quarry deposits. The sub-basin drains into a drainage canal that separates Sub-basin K from the Kapa'a Quarry Road. Sub-basin K is the area that will be used for the Lower portion of the Kapa'a Light Industrial Park.
L	62	33%	Sub-basin L contains the Lower Phase I part of the Kapa`a landfill, which is also the site of the old first Ameron quarry. A drainage swale collects the runoff and conveys it to a retention pond. The Sub-basin L is the only sub-basin of the Kapa'a watershed that drains directly into the Kawainui Marsh and not into the Kapa'a Stream.
Sum	**825**	**10%**	Total area of Kapa'a watershed considered in the model; with 763 acres of sub-basins A through K draining into the Kapa'a Stream through Kapa'a Stream and 62 acres draining through sub-basin L into the Kawainui Marsh.

The 2011 FEIS described an assessment of the DoH data for the water quality implications in the Kapa'a Stream. The sub-basins in the DoH model were further subdivided into areas of different land uses, such as forest/brush, industrial, roads, highway, quarry, and landfill. The area with different land uses within the sub-basins had their individual impervious factors, such as roads, highways and industrial, with respective imperviousness factors of 0.4 to 0.75, 0.57 and 0.80.

Furthermore, each sub-basin had its own dry and wet season and annual precipitation rate, with the Lower stretches of the valley having somewhat Lower precipitation rates than the Upper end of the valley, which had higher elevations.

Of the 825 acres of the Kapa'a watershed considered in the DoH model, 94 acres of land within the sub-basins have imperviousness greater than 40%, and about 20 acres are connected to existing drainage systems at the project site. Table 3.2.3.1 lists the average imperviousness of the entire watershed and the individual sub-basins, which were calculated as the weighted mean of the areas with different land uses. The model suggested that the project site, which is represented by portions of sub-basins E, G and K, has a compound imperviousness of 42%

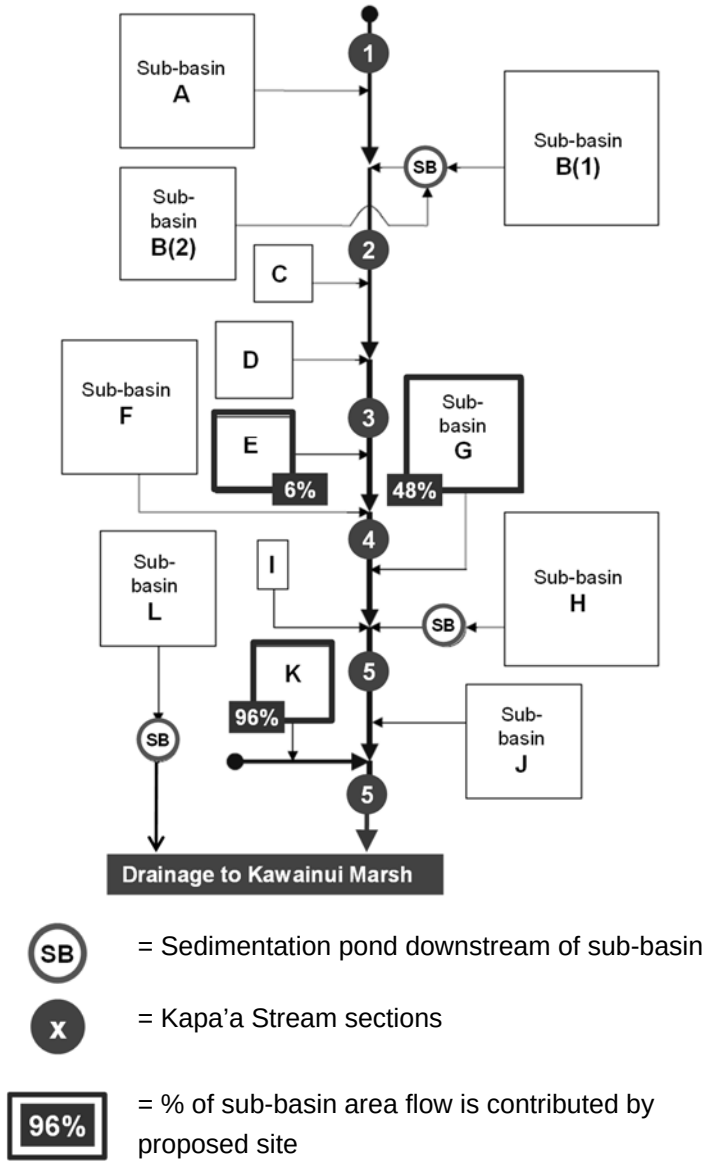


Figure 3.2.3.3: Flow chart of the DoH subbasins discharging into the Kapa'a Stream

The subbasins E and G represent the Upper site and the subbasin K the Lower site.

The Lower site, subbasin K in the DoH model, was predicted to it dischrage into the existing drainage ditch along the Kapa'a Quarry Road. The drainage ditch would then discharge into the Lower reaches of the Kapa'a Stream, just upstream of the culvert under the quarry raod, through which the Kapa'a Stream dischrages into the Kawainui marsh.

The DoH analysis considered a wet season baseline scenario and a 2% flow event scenario, with the resulting flow rates and pollutant load levels in the Kapa'a Stream. The baseline case referred to drainage conditions, where the flow rate and resulting pollutant load level in the stream were caused by

the release of groundwater from the watershed. The 2% event refers to the highest 2% of the average rainfall events in the dry or wet season. The 2% data suggests water quality effects due to high flow rates and resulting high loads of pollutants discharged into the Kapa'a Stream.

Using wet season flow rates and pollutant loads in the Kapa'a Stream provides a conservative representation of the contribution of the proposed project site to the overall water quality of the Kapa'a Stream. The amount of total suspended solids (TSS) is used to describe the water quality of the stream in different scenarios. The resulting flow rates and pollutant load rates for the wet season baseline and 2% event were presented for the existing conditions at the proposed site. Twelve of the 13 sub-basins contributed to the water quality of the Kapa'a Stream; Sub-basin L did not drain into the Kapa'a Stream but drained directly into the Kawainui Marsh through culverts under the Kapa'a Quarry Road.

Figure 3.2.3.3 illustrates the estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season as percentages of total flow and loading. Under the baseline conditions, Sub-basins B (sum of B(I) and B(II)) combined are the largest contributors to both the water flow rate and the pollutant loading in the Kapa'a Stream. Other large contributors are sub-basins A, F, G and H, though sub-basin A contributes less TSS than the other three sub-basins in this group of four. The sub basins E, G, I and K, which include the flows and pollutant loads under existing conditions at the proposed site, contribute more TSS than water flow. This is due to the high TSS contributions of the industrial part of sub-basin G, which represents the existing warehouse development on parcel TMK 4-2-015:013 and 014 (the Upper site) and the sub-basin K, which is the Lower site in TMK 4-2-15:014.

Figure 3.2.3.4 illustrates the estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season 2% event as percentages of total flow and loading. The contributions of sub-basins B and H are significantly reduced because of sedimentation ponds, which hold back TSS loads from these two sub-basins. In the DoH analysis, the runoff from sub-basin B and H does not contribute to the water flow and TSS loading of the Kapa'a Stream is greatly reduced, respectively. Sub-basin D is by far the biggest contributor regarding TSS loading, followed by Sub-basin F. The proposed site, in the present condition, contributes more water flow than TSS. This is partly since in the 2%-event, the industrial part of sub-basin G discharges more flow than TSS. The TSS loading of the Lower part of the proposed site, the landfill area of sub-basin K, contributes most of the TSS loading. This suggests that the landfill area in sub-basin K, which currently does not have sufficient measures against surface erosion, is a main contributor of TSS loading to the Kapa'a Stream from land that represents the proposed project site.

The assessments in Figures 3.2.3.4 and 3.2.3.5 represent the conditions of the project site at the time of the 2011 FEIS.

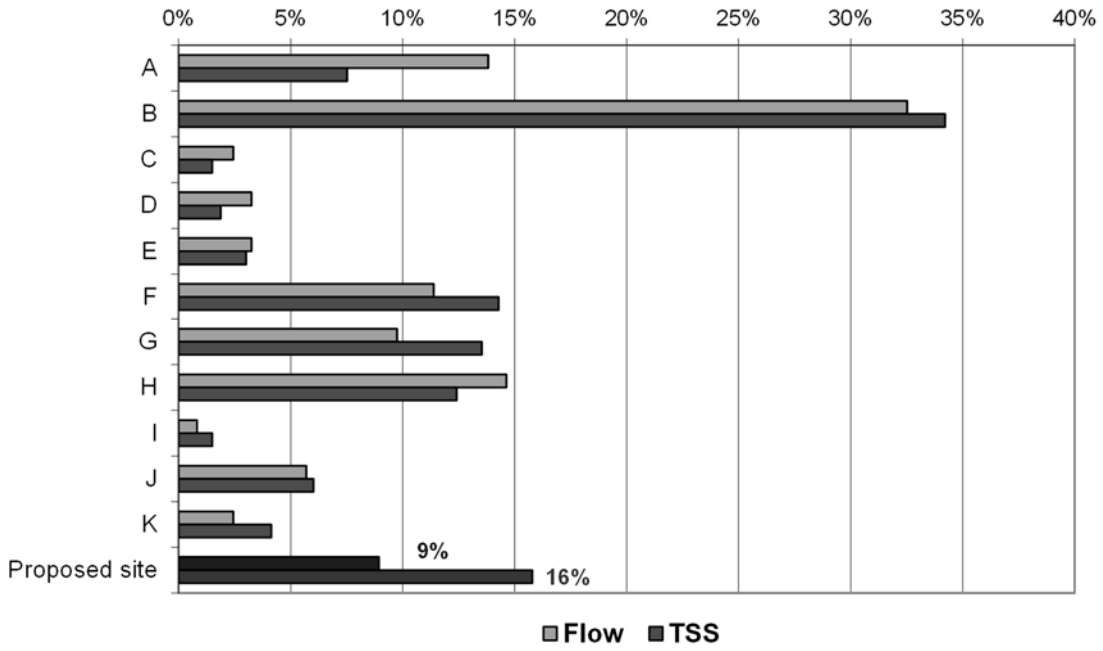


Figure 3.2.3.4: Wet Season Base flow and Pollutant Load (source data from 2011FEIS)

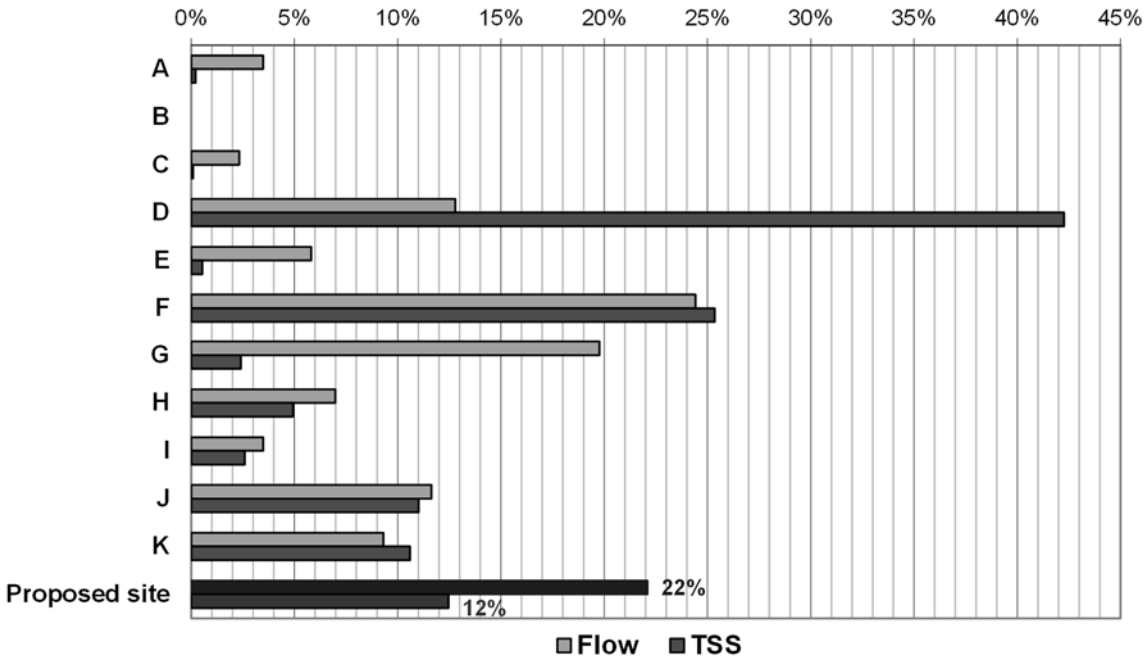


Figure 3.2.3.5: Wet Season 2% Event and Pollutant Load (source data from 2011FEIS)

3.2.4 Existing Drainage System at Project Site

Section 3.2.4 describes the existing drainage system at the project site of the 2011 FEIS, and the significant changes that have been made in the years since the 2011 FEIS was approved.

Figure 3.2.4.1 illustrates the site drainage as described in the 2011 FEIS. Most of the onsite storm runoff flowed to the Kapa'a Stream corridor by means of surface flow and was discharged from the site either through one existing detention pond or through a series of drain outlets. This site drainage also included runoff from off-site sources (Subbasin I depicted in Figure 3.2.3.2 and described in Table Figure 3.2.3.1) which entered the Lower portion of the site through an existing 30-inch drainage culvert under the Kapa'a Quarry Place roadway (refer to Figure 3.2.2.5 which describes the location of the drainage culvert).

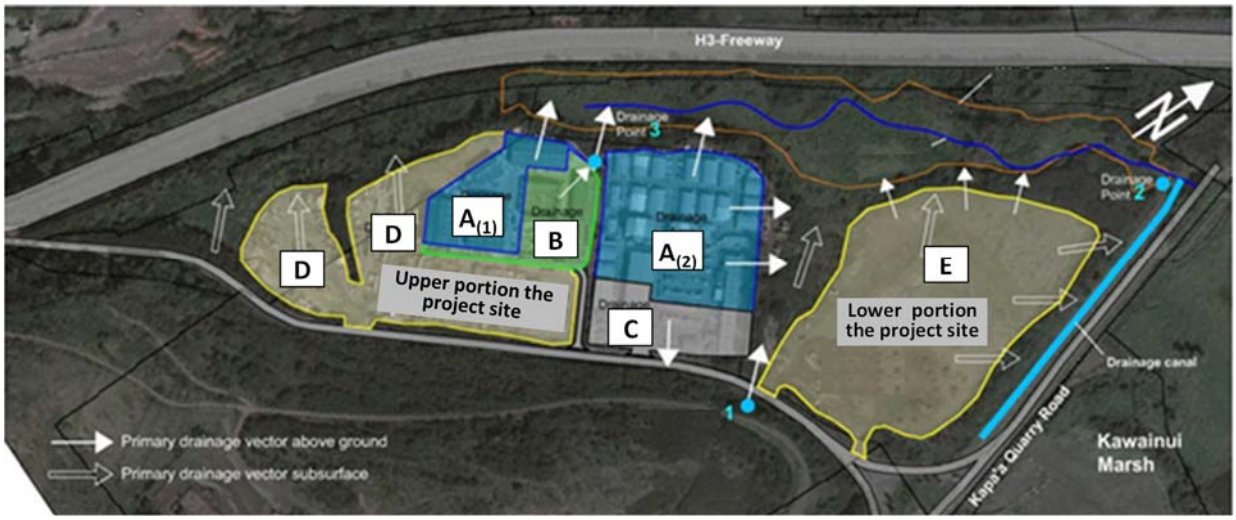


Figure 3.2.4.1: Project site drainage as described in the 2011 FEIS

Figure 3.2.4.1 distinguishes between five types of drainage areas that were present at the time the 2011 FEIS was approved. Four types of drainage areas were described in the 2011 FEIS and one drainage area was added:

<u>Drainage Area A</u> was the of the drainage of the Upper portion of the project site that drained to the Kapa'a Stream corridor either through drain inlet structures or by simple site runoff over the edge of the pavement into the pervious and vegetated site perimeter. The total size of drainage area A, composed of two separate areas, was 9.4 acres. Drainage area A(2) represent the "older" portion of the existing warehouses, with warehouses constructed about 30 years. Drainage area A (1) includes warehouse structures which were built between 15 and 10 years ago. The entire drainage Area had an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore, the entire area contributed to the runoff volume, including the runoff from the warehouse roof surfaces.

Drainage Area B drained through an existing small detention pond. The detention pond's main function was flood control and primary treatment before discharge to the stream corridor. The outfall of the small detention pond was an armored spillway to curb erosion of the downward slope to the stream corridor. The entire 2.5-acre Drainage Area B contributed to the runoff volume, including the runoff from the warehouse roof surfaces. The stormwater collected by sheet flow flowed towards shallow swales formed within the concrete pavement. A portion of the drainage flow was conveyed to an existing 400-feet vegetated swale, which discharged into the small detention pond.

Drainage Area C represented a 2.8-acre part of the Upper portion of the project site, which drained into the existing drainage system of the quarry access road. The entire area had an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore, the entire area contributed to the runoff volume. The stormwater collected by sheet flow towards shallow swales which were formed within the concrete pavement surfaces and which convey the stormwater to the drainage of the quarry access road. The main drainage of the Kapa'a Quarry Place roadway was a vegetated swale along the Southern side of the road. The runoff within the drainage ditch flowed towards the east towards a drain intake structure of an existing 30"-culvert under the quarry access road. The culvert conveyed the entire runoff from the vegetated swale to Lower portion of the project site.

Drainage Area D represented graded and partially pervious areas within the Upper site which had no existing drainage infrastructure, only surface runoff to adjacent areas. Percolation tests conducted after the 2011 FEIS indicated poor percolation rates in the soil layers an 18-inch top layer of gravel. Consequently, only a smaller portion of precipitation infiltrated during heavy rain events until the top layer became saturated and the residual precipitation left the site as surface runoff. Runoff left the site via the North and West and flowed to the Kapa'a Stream corridor. Runoff left the site over the Southern perimeter, flowed towards the vegetated swale along the Kapa'a Quarry Place and from there towards the Lower portion of the site.

Drainage Area E was the drainage from the Lower portion of the project site. The same runoff mechanisms were observed as for drainage area D, with portions of the precipitation infiltrating into the topsoil and the remainder leaving the site as surface runoff. The runoff left the via the Eastern and Northern site perimeter, towards the drainage ditch along the Kapa'a Quarry Road and toward the Kapa'a Stream corridor, respectively.

Since the 2011 FEIS was approved, some of the storm water drainage approaches have significantly changed for Drainage areas, where the storm water impacts have been significantly reduced through structural BMPs. The improved storm water management measures have either been installed or are planned for installation.

Improvement for the drainage areas A through D is described as follows:

Both drainage area A(1) and A(2) have been fitted with improved drain inlets.

In drainage area B, a manufactured treatment device (MTD) has been installed as part of a larger storm water management system. The MTD filters the portion of the storm water runoff that is defined as the water quality (WQ) relevant base flow.

Drainage area C has basically the same storm water management system as before.

The storm water management in Drainage area D, which was previously graded and not paved, has been divided into three areas with different storm water treatment and management methods.

- A 4-acre portion of drainage area D, where five new warehouses are being constructed, will have an impervious cover and a new drainage system comprised of an underground detention vault, one MTD to treat the WQ relevant flow and a new armored outfall.
- A 3.5-acre portion of drainage area D has two warehouses which were completed in 2015. The areas were paved, and the drainage runs towards an existing detention and infiltration basin, which is located to the West of the largest warehouse (Building 50). The basin functions as a low impact development (LID) storm water management system.
- A 2.5-acre portion of drainage area D is currently under development. Drainage will be through the existing detention and infiltration basin and a vegetated buffer strip.

The drainage area E remains in the same condition as was described above. The area is under development and will receive a comprehensive storm water management system, which will include multiple underground detention vaults, vegetated buffer strips, MTDs and armored outfalls to the Kapa'a Stream corridor.

For the Upper portion of the site, with its diverse storm water treatment systems, NPDES Non exposure exemptions certifications were obtained. This means that within the warehouse development, effective source controls have been implemented and are maintained which lower the storm water pollution through proactive procedures. The storm water pollution prevention is being actively managed by Kapa'a management.

In Section 6.2 of this Draft SEIS, the storm water management approach for the entire site is described in detail. <u>An updated description of the storm water treatment and management system is described in Appendix C. The updates of storm water systems were requested by the Accepting Agency to lower the storm water impacts by adding one drainage area in the Lower site, and increase detention vault capacity.</u>

3.2.5 Wetlands

Section 3.2.5 of the 2011 FEIS described the wetland areas in the vicinity of the site. No changes have occurred in respect to the location and sizes of these wetlands.

Wetlands are defined by the United States Army Corps of Engineers (USACoE) and the United States Environmental Protection Agency (EPA) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and similar areas." While in the past wetlands were frequently filled or

drained to make room for agriculture or other land uses, the significant ecological value of wetland is now recognized. This has resulted in comprehensive efforts to secure and restore wetlands.

The Kawainui Marsh is adjacent to the proposed site and represents one of the most important wetlands in the State of Hawaii. Some additional wetland areas are present within the Lower reaches of the Kapa'a Stream corridor in the vicinity of the confluence of the Kapa'a Stream and the drainage canal adjacent to the Kapa'a Quarry Road. Since the Kapa'a Stream drains into the Kawainui Marsh, the stream's flow conditions, and water quality directly affect the marsh. Figure 3.2.51 shows the vicinity map to the proposed site the adjacent wetland areas which was presented in the 2011 FEIS. Figure 3.2.5.1 illustrates that the project site will be located entirely outside of wetland areas.

While the Kawainui marsh is listed in the National Wetlands Inventory, the wetland inside the Kapa'a Stream corridor is not listed. The National Wetlands Inventory is maintained by the US Fish and Wildlife Service (USFWS), which is the principal US Federal agency tasked with providing information to the public on the status and trends of our Nation's wetlands. The US FWS National Wetlands Inventory (NWI) is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of US wetlands.

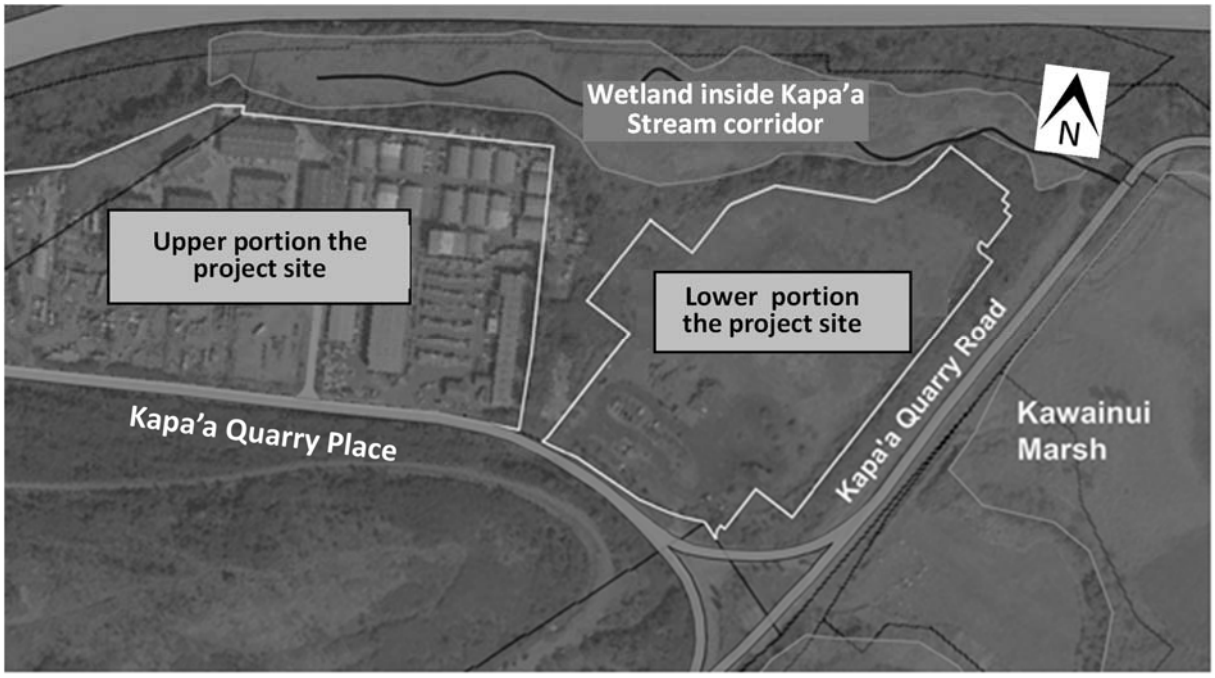


Figure 3.2.5.1: Wetland areas in vicinity to the proposed site (source Figure 3-20 of the 2011 FEIS)

3.2.6 Flood and Tsunami Hazards

Section 3.2.6 of the 2011 FEIS described the flood and tsunami related impacts to the project site. No changes have occurred since the 2011 FEIS was approved.

The project site is located outside of any potential tsunami inundation area. Figure 3.2.6.1 shows a portion of the Flood Insurance Rate Maps (FIRM) for the vicinity of the proposed project site. FIRM maps

are used to determine the vulnerability of land to flooding. It has been observed that sections of the Kapa'a Quarry Road adjacent to the mouth of the Kapa'a Stream and the existing culvert under the Quarry Road are intermittently inundated at times of heavy rainfall events. During such periods of flooding, the Kapa'a Quarry road was be closed for traffic.

Most of the land within the proposed site is in Flood Zone D, which indicates areas with possible but undetermined flood hazards. Figure 3.2.6.1 indicates that some low-lying areas of the Lower portion of the project site adjacent to the Kapa'a Quarry Road are located within the flood zones X and A. The Flood Zone A refers to land, which is likely to be inundated by the flood event having a one-percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year" flood. Land that is within the Flood Zone X represents moderate to minimal flood hazards. Land designated as Flood Zone X has flood vulnerability of equal or less than the 0.2-percent-annual-chance or 500-year flood.

Land inside the property and inside flood zones A and X is limited to the existing drainage channel adjacent to the Kapa'a Quarry Road and to the mouth and Lower sections of the Kapa'a Stream. No portion of the proposed development footprint is within flood zones A and X.

It must be noted that the proposed grading will significantly increase the elevation of the Lower portion of the site in such a way that no flood threat will remain.

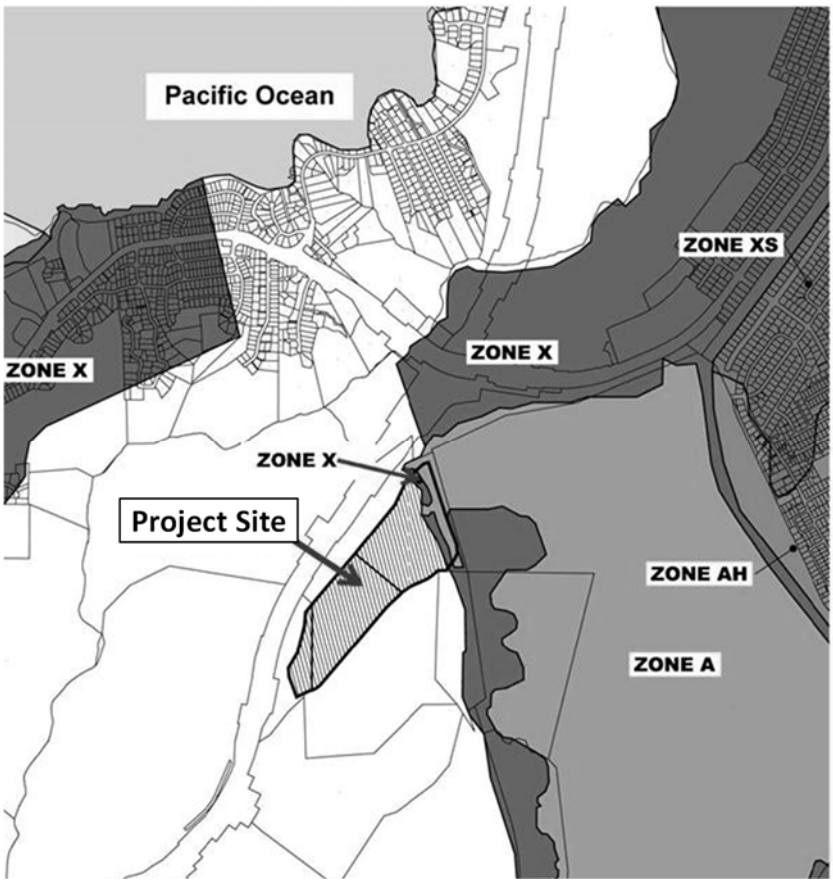


Figure 3.2.6.1: Map of flood zones in the vicinity of the proposed site

(Source Figure 3-21 of the 2011 FEIS)

Description of Flood zones:

- Zone A -100 Year flood zone; no base flood elevation determined
- Zone AH -100 Year flood zone; with 1 to 3 feet of ponding
- Zone D - Possible but undetermined flood hazards
- Zone X - Beyond 500 years flood plain
- Zone XS -500 years flood plain

Figure 3.2.6.2 shows a portion of the current tsunami evacuation map for the vicinity of the project site. The O'ahu Tsunami Evacuation Map is published by the City and County of Honolulu and defines the Evacuation Zone (TEZ) or an Extreme Tsunami Evacuation Zone (XTEZ), and provides guidelines for safety actions to take. Figure 3.2.6.2 illustrates that a portion of the project site is inside the XTEZ. No specific evacuation guidelines have been distributed to the current tenants, which occupy only the Upper site and are therefore outside the XTEZ.

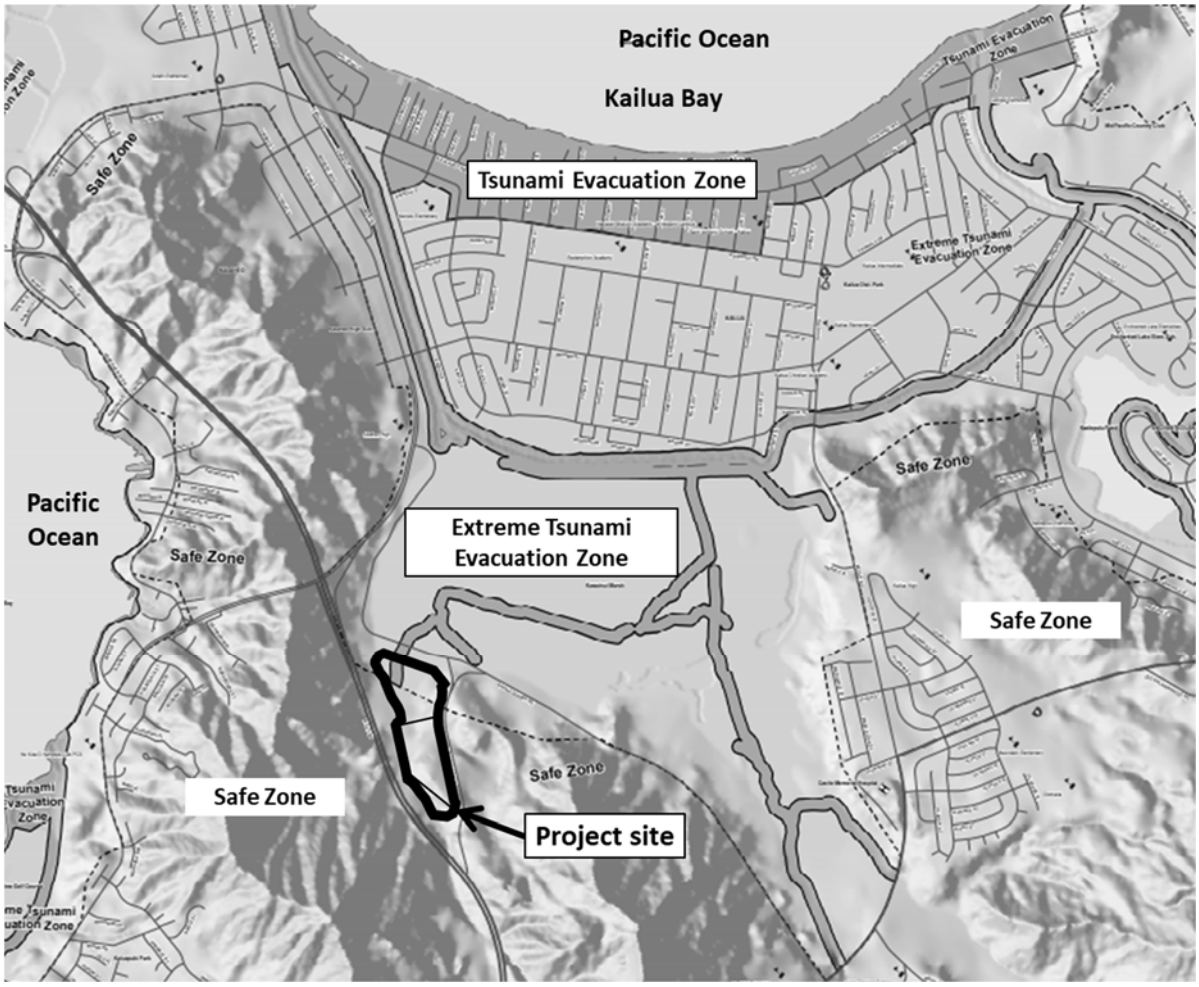


Figure 3.2.6.2: Portion of project site inside extreme tsunami evacuation zone (source: https://cchnl.maps.arcgis.com/apps/webappviewer/index.html?id=39a9e07068a14d01a85b437adcf50beb annotated) (this figure was added to the DESIS document)

3.3 Biological Resources Current Environment

Section 3.3 of the 2011 FEIS described the biological resource of the existing environment on and adjacent to the project site. Only small changes have occurred in the biological resource environment since the 2011 FEIS was approved.

The core of the proposed project site consists of developed land, which comprises approximately 55 percent or 43 acres of the total 79-acre property (combined TMK 4-2-1:013 and 014). The project site has basically not changed since the 2011 FEIS. Presently, only the Upper portion of the proposed site is developed with warehouse structures and base yards. There are basically no landscaped areas in the interior, save a few narrow strips with trees around warehouses. There are some landscaped areas at the perimeter of the Upper portion of the project site.

The Lower portion of the site is unpaved land covered with a pervious gravel surface and the land is used for a variety of low impact activities, such as storage of new vehicles, on areas that are not actively graded. The graded part of the Lower portion of the site does not have any permanent or landscaped vegetation. Sections of the Kapa'a Quarry Road and the Kapa'a Quarry Place are within the property and contribute about 3 acres of impervious area that is outside the project site.

Most of the vegetation of the properties is within the undeveloped land surrounding the site and within the adjacent Kapa'a Stream corridor. These lands include natural areas and bodies of water, such as forested areas, stream beds and wetland areas. The forested areas can be further divided into forested buffers and some mature, contiguous sections of forest in the Kapa'a Stream corridor. Forested buffers occur along the site perimeter and adjacent roads. Aquatic resources on the property consist of the Kapa'a Stream, approximately 10 acres of wetland area and a drainage ditch along the quarry road. The vegetated and undeveloped land provides some habitat for a population of urbanized birds and small mammals.

3.3.1 Vegetation

<u>Landscaped areas</u>

The current landscaped area is less than two acre of the developed area. The landscaped areas are located along the site perimeter facing the Kapa'a Quarry Place roadway and the existing detention and infiltration basin. The landscaped areas include turf lawns, flower beds, individual shrubs, hedges, groundcover areas and landscaped trees. Presently, maintenance crews mow and trim the lawn throughout the growing season, apply a pre- and post-emergent herbicide, and fertilize. Leaves are raked and or blown. Flowers are sprayed, fertilized, and pruned. Beds are weeded, planted, and mulched. Where needed the landscaped areas are irrigated with permanent sprinklers. The landscaped vegetated areas provide aesthetic beauty to the existing development, as well as habitat to wildlife occurring in the area.

<u>Natural Vegetation Areas</u>

Areas of natural vegetation areas are situated around the project site and in the Kapa'a Stream corridor, which is located on the property and directly adjacent to the north of the proposed site. The existing vegetation in these areas includes overgrown vegetation and shrubberies of:

- Haole koa (Leucaena leucocephala)
- Guava (Psidium guajava)
- Chinese banyan (Ficus microcarpa)
- Monkeypod (Samanea).
- Hau (Hibiscus tiliaceus)
- Overgrown umbrella sedge (Cyperus alternifolius)
- Elephant grass (Pennisetum purpureum)
- California grass (Brachiaria multica)

Figure 3.3.1.1 illustrates the natural vegetated areas around the project site as described in the 2011 FEIS. Of the areas A through G in Figure 3.3.1.1 only areas E has changes since the 2011 FEIS. A portion of area E was a vegetated strip with a shallow berm protruding into the site. This portion of area E area within the project site has been removed and replaced with a retaining wall that separates two areas of the Upper site with a 4 to 6-foot elevation differential.

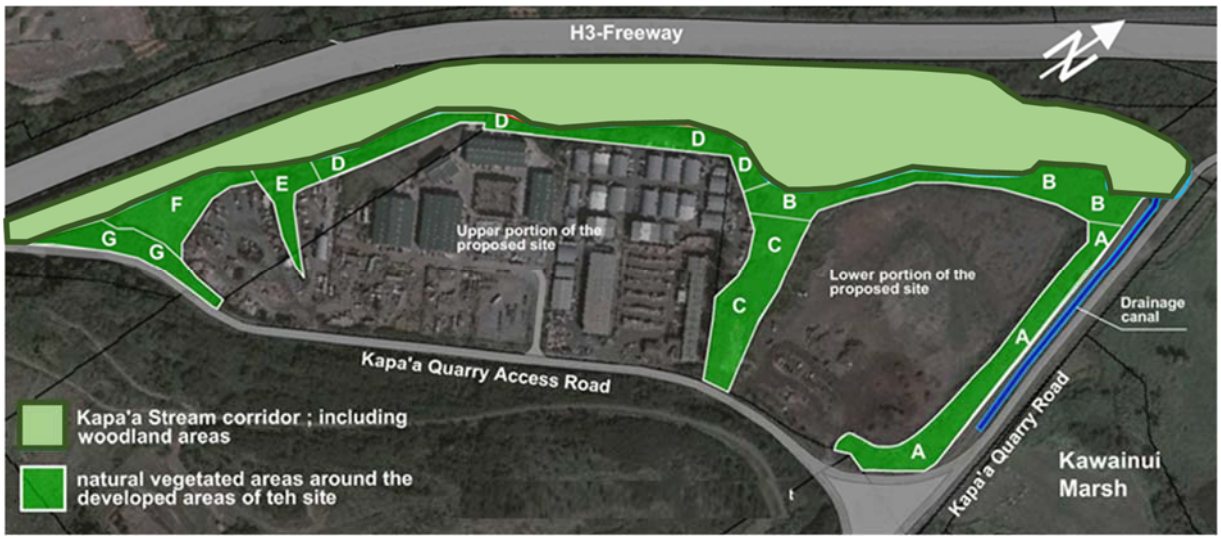


Figure 3.3.1.1: natural vegetated areas around the project site as described in the 2011 FEIS (source Figure 3-22 of the 2011 FEIS)

Table 3.3.1.1: Natural vegetated areas found adjacent to the proposed site

Type of vegetated area: Subzones		Total size acres	Subtotal acres
Kapa'a Stream corridor		19.5	
Delineated wetland (approximate)			15.0
rest of stream corridor			4.5
Vegetated area with mixed vegetation:		12.7	
A	On earth berm along the quarry road and drainage canal		2.5
B	Woodland along upland boundary of wetland area		2.5
C	Sloped area between upper and lower portion of the site		2.1
D	Woodland on sloped areas between upper portion of site and stream corridor		2.4
E	Vegetated earth dike within and at perimeter of upper portion of the site		0.8
F	Former siltation pond vegetated with grass and shrubs		1.3
G	Mature woodland along the quarry access road		1.1
Drainage canal		0.5	

The natural vegetated areas as depicted in Figure 3.3.1.1 are briefly described in the following:

Kapa'a Stream corridor: The stream corridor is located within the property, between the H3-Freeway and the developed areas, and has a total area of approximately 20 acres. The flow path of the Kapa'a Stream through the property has a length of approximately 3,800 feet, entering the property at the culvert under the H3-Freeway and leaving the property through the culvert under the Kapa'a Quarry Road, where the Kapa'a Stream flows into the Kawainui Marsh. The stream meanders through the stream corridor and is at length as an intermittent stream and becomes a perennial stream in the last approximately 6,000 feet before the stream ends at the culvert under the quarry road. The width of the stream corridor increases towards the end of the stream and ranges from 150 to 250 feet, being the widest in the wetland areas in the Lower stretches of the stream. The stream corridor has mixed vegetation, including mature trees, which are more frequently located on the northern side of the stream corridor (e.g., away from the development footprint), shrubs and dense stretches of wetland vegetation.

Natural vegetated area – Section A: Section A is situated at the Eastern perimeter of the Lower portion of the project site, along the Kapa'a Quarry Road. This vegetated section has an approximate length of 1,200 feet, an average width of 100 feet and an area of about 2.5 acres. Within Section A an earth dike with a width of approximately 20 to 40 feet and a height ranging between two and four feet accommodates smaller trees, a variety of shrubs and a range of invasive grasses. The foot of the earth dike starts approximately 20 feet from the mauka bank of the drainage canal, creating a maintenance road. The maintenance road was used until several years ago to maintain the drainage ditch. For the past several years, no regular maintenance has been done to the drainage ditch and the ditch as well as the maintenance road are now overgrown with dense vegetation.

Natural vegetated area – Section B: Section B is located at the Northern perimeter of the Lower portion of the site facing the Kapa'a Stream corridor. Section B is the 2.5 acres upland of the adjacent wetland. Section B stretches from the drainage canal to the foot of the sloped area which separates the Upper and Lower portions of the project site. The section has a length of approximately 1,200 feet and ranges in width between 200 feet in the north east to 60 feet in the west of the section. The section has a variety of smaller trees, shrubs, and invasive grasses.

Natural vegetated area – Section C: Section C is located on a sloped area that separates the Lower and Upper portions of the project site. The 2.1-acre vegetated land section has an approximate length and width of 600 and 150 feet, respectively. In the steepest areas in the section slopes range between 50% and 90%. The vegetation consists of several larger trees, shrubs of different sizes and a variety of grasses. Mature trees are in the Upper part of Section C at the border between parcels TMK 4-2-15:013 and 014.

Natural vegetated area – Section D: Section D is the steeply sloped area that separates the developed Upper portion of the project site from the stream corridor. Section D has a size of 2.4 acres. The natural vegetation on the sloped area starts immediately past the paved and stabilized developed area and merges with the vegetation of the stream buffer. The slopes in this section average about 50 percent. The elevation difference between the developed area on the graded plateau of the Upper site and the stream corridor is between 30 and 60 feet, with the stream corridor loss of elevation about 70 feet from the most South Western point to the most North Eastern point. The section has a thick vegetation of trees, shrubs and bushes and has little stabilizing ground cover over a part of the sloped area.

Natural vegetated area – Section E: Section E is a smaller, less than an acre, natural vegetation area that starts at the site perimeter and stretches approximately 300 feet towards the interior of the developed land within the Upper portion of the site. The former small section is an earth berm with a height of 3 to 5 feet and a width of 10 to 30 feet which held smaller trees and some shrubs was removed in 2016 to make room for site development.

Natural vegetated area – Section F: Section F is a near triangular plateau with a base length of 250 feet and a height of 350 feet. The area measures approximately 1.1 acres. The section is an existing detention and infiltration basin which was previously used as a siltation basin for quarry runoff. This basin no longer receives runoff from the quarry and has presently a thick and dense vegetation. The perimeter berms at the stream side are still in existence and therefore the basin can still be used for storm water management. At present, Section F contains grasses and small shrubs, high grasses, but no trees.

Natural vegetated area – Section G: Section G is an approximately 600-foot stretch of vegetated sloped are that separates the Upper site from a section of the Kapa'a Quarry place roadway. At the time of the 2011 FEIS, this area contained several mature trees along the roadway. The trees were removed in 2015 since they impeded sight distance for the roadway access to the site.

The existing drainage ditch along the quarry road: The function of the ditch was to convey runoff, both seepage from the Lower portion of the site and surface runoff, towards the Kapa'a Stream. The canal had an average width of 12 feet and an approximately length of 1,150 feet, from the beginning at the

intersection of Kapa'a Quarry Road and Kapa'a Quarry Place to the confluence with the Kapa'a Stream. As described in Section 3.2 of this Draft SEIS the drainage ditch no longer serves as a reliable conveyance of storm water runoff, since it is filled and is overgrown with dense vegetation.

3.3.2 Wildlife

Section 3.3.2 of the 2011 FEIS describes the wildlife at the project site. There basically have been no changes since the 2011 FEIS was approved.

Due to historic use of the property for various industrial activities in the past 50 years, the Upper tier of the site has been devoid of avifaunal (bird) habitat mostly because of removal of natural vegetation cover and ongoing human activities. The open space within the Lower tier and at the mouth of Kapa'a stream, however, provides habitat for a range of birds, mammals, and aquatic species. Observations suggest that the feral cat population in the area has been a main predator for the bird population. Birds and mammals sighted or observed around and within the proposed project site include:

Birds:

Common name	Scientific name
Cardinal	Cardinalis cardinalis
Cattle egret	Bubulcus ibis
Barred dove	Geopedia striata
Mynah	Acridothera tristis
Lace-necked dove	Streptopedia chinensis
Sparrow	Passer domesticus
Japanese white-eye	Zosterops jaonica
Shama thrush	Copsychus malalaricus

Mammals:

Common name	Scientific name
Mongoose	Herpestes auropunctatus
Mice	Mus musculus
Rat	Rattus rattis, norvegicus
Feral Cat	

The adjacent Kawainui Marsh is an important habitat for birds and other wildlife. The number and variety of birds observed in the Kawainui Marsh has varied over time. When the Kawainui Marsh was an open lake, before vegetation overgrowth and sedimentation had reduced the habitat area, many endemic birds made their habitat there. Over time the number and variety of birds have decreased. The following birds have been sighted by different investigators in and around the Kawainui Marsh:

Common name	Scientific name
Cardinal	Cardinalis cardinalis
Pintail	Anas acuta
Mynah	Acridothera tristis
Pacific Golden Plover	Pluvialis dominica fulva

Japanese White-eye	Zosterops jaonica
Black-crowned Night Heron	Nycticorax nycticorax hoactli
Hawaiian Duck (*)	Ana wyvillienu
Hawaiian Coot (*)	Fulica americana alai
Hawaiian Stilt (*)	Himantopus himantopus knudseni
Hawaiian Gallinule (*)	Gallinula chloropus sandvicensis
Shoveler	Anas clypeata
Frigate Bird	Fregata minor

(*) = endangered birds

The following aquatic fauna has been sighted by different investigators in waters in and around the Kawainui Marsh:

Common name	Scientific name
Pelagic milkfish or awa	Chanos chanos
Aholehole	Kuhlia sandvicensis
Mullet	Mugil cephalus
Papio	Caranx sp.
Barracuda	Sphyraena
Nehu	Encrasicholina purpurea
O'opu	Eleotris sandwicensis
Rice eels	Monopterus sp.
Hawaiian river shrimp	Macrobrachium grandimanus
Crenate swimming crab	Thalamita crenata
Worm	Tendipes

To enhance and restore the natural habitat and encourage re-migration and nesting indigenous fauna to the area, there have been recent initiatives to reintroduce some of the species of birds and restore appropriate habitats within the Kawainui Marsh or on adjacent land.

3.3.3 Threatened & Endangered Species and Species of Special Concern

Section 3.3.3 of the 2011 FEIS described considerations of threatened and endangered species. The situation of the treated and endangered species at the project site has not changes since the 2011 FEIS was approved. The input and recommendations provided by the U.S. Fish and Wildlife Service (USFWS) in conjunction with the 2011 environmental review is still being followed for the site development approach.

In 2011 the U.S. Fish and Wildlife Service (USFWS) stated that the project site is in the vicinity of the Kawainui Marsh and the Kapa'a Stream, which are both habitat for the federally endangered Hawaiian stilt (Himantopus mexicanus knudseni), Hawaiian moorhen (Gallinula chloropus sandvicensis), Hawaiian coot (Fulica alani) and Hawaiian duck (Anas wyvilliana) as well as populations of migratory waterfowl and shorebirds protected under the Migratory Bird Treaty Act as amended (MBTA). While endangered

species find habitat in the vicinity of the proposed site, the site is currently not a habitat for federally listed water birds or for listed migratory waterfowl and shorebirds. There is no designated critical habitat within the proposed project site.

The USFWS recommended structure and organizational measures to ensure that water birds attracted to the site were not exposed to predators. For the site development planning in 2010 through 2011, the USFWS suggested that surface detention ponds might attract breeding water birds, although the design had called for "dry" detention ponds. By using large volume underground vaults that will retain stormwater permanent body inside the detention ponds will be avoided.

3.4 Cultural Resources Existing Environment

Section 3.4 of the 2011 FEIS described the existing cultural resources in the vicinity of the project site. The existing environment of cultural resources has not changed since the 2011 FEIS.

The project site and the Kapa'a Valley have been heavily impacted by industrial activities in the past fifty years. The project site is devoid of any archaeological or cultural resources and the project site is exclusively located on land that was covered by layers of landfill from quarry operations or municipal waste several decades ago. A comprehensive archaeological survey conducted by Cultural Surveys Hawaii, Inc. (CSH) (Cultural Survey Hawaii, 2000) indicated that most of the historical or culturally significant sites in the vicinity of the project were found around the southern perimeter of Kawainui Marsh.

Figure 3.4.1 indicates locations of significant historical discoveries close to the Kawainui Marsh, as presented in the CSH study. The Pahukini Heiau is the closest major historical site to the project site. The Pahukini Heiau is a 120 by 180 feet stone structure and is on the site of a former landfill within TMK 4-2-15:003, adjacent to the project site. According to the website of the Office of Hawaiian Affairs the Pahukini Heiau was built by the Chief Olopana and was used in important state functions. The Heiau was surrounded by landfill operations and was badly neglected for many years, until it was restored and rededicated in the late 1980s. Other historical sites close to the Kawainui Marsh are shown on Figure 3.4.1 and are briefly described in Table 3.4.1. The column indicated as "State Site #" in Table 3.4.1 refer to the Hawaii State Register for Historic Places.

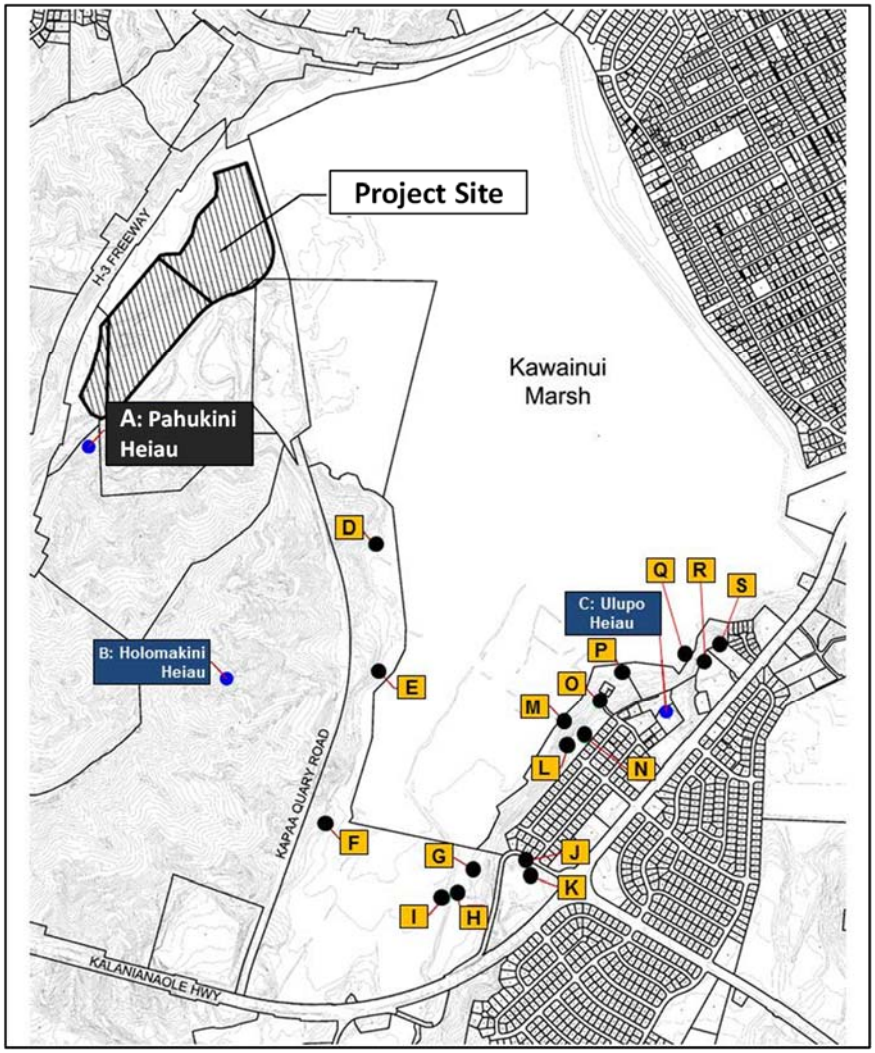


Figure 3.4.1: Cultural resources existing environment

The identifiers "A" trough "S" are described in detail in Table 3.4.1.

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
A	50-80-11-359	Pahukini Heiau; in the middle of landfill in Kapa'a Quarry. Heiau also called Mo'okini Heiau; said to be built by High Chief Olopana in the 12th century; heiau is a Luakini or state-class heiau , where important state matters, including preparation for war were conducted.

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
B	50-80-11-360	Holomakini Heiau; supposedly built by high chief Olopana in the 12th century; the heiau was long thought to be destroyed when the land it occupied was cleared for agriculture; the indicated location is the presumed location of the Holomakini Heiau.
C	50-80-11-371	Ulupo Heiau; heiau was thought to be built mystically in one night by the Menehune; heiau had significance in preparing animal sacrifice; the site is a State park.
D	50-80-11-2023	Remnants with retaining walls, alignments of rocks, terraces, and platforms
E	50-80-11-3865	Low stone wall and terrace
F	50-80-11-2026	A large agricultural terrace
G	50-80-11-2024	Mounds, wall remnants, a terrace
H	50-80-11-3962	Three historical building
I	50-80-11-3962	Earthen mounds
J	50-80-11-3960	A large lo'i, stone and earthen platform, stone lined channel, mound
K	50-80-11-2028	Wall remnants
L	50-80-11-2029	Large agricultural complex with rectangular fields
M	50-80-11-3959	Large number of mounds, agricultural terraces, walls, historical house foundation, etc.
N	50-80-11-2031	Several surface artifacts, evidence of prehistoric occupation
O	50-80-11-3961	Stone mounds, stone-edged canal, terraces, retaining walls

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
P	50-80-11-3957	Agricultural terraces, mounds, walls, remains of historical structure
Q	50-80-11-2022	Series of terraces, long retaining wall, remnants of historical house, a spring
R	50-80-11-3958	Terrace, walls
S	50-80-11-2027	Stone-walled enclosure, piles of rock, terrace

3.5 Air Quality

Section 3.5 of the 2011 FEIS described existing air quality conditions at project site. There have been minor changes in air quality.

The 2011 FEUS stated that air pollution in the vicinity of the proposed site could be attributed to anthropogenic and natural sources. Air quality impacts due to human activities mainly resulted from various commercial and industrial activities and from traffic. Recent changes in the land use and activities at the project site caused some source of potential air pollution to cease and other impacts to be added:

- Motor vehicles, cars, and trucks on the adjacent Kapa'a Quarry place roadway and inside the project site. Besides light vehicles there are a considerable number of heavy vehicles that serve the quarry operations in the Upper portion of the Kapa'a valley, the refuse transfer station, the existing warehouse development, and other industrial activities in the area.
- Commuters from Kailua and Kaneohe and service trucks use the Kapa'a Quarry Road to travel to and from the central part of Oahu, between the Mokapu Avenue and the Kalanianaole Highway.
- Over the past two years, a segment of the Lower portion of the site has been used to store new cars on areas that have been graded and received a gravel surface. The cars were intermittently brought to and removed from the Lower site the site. These cars add to the traffic emissions.
- The H3-Freeway directly passes the proposed site on its northern boundary and represents a significant contributor for release of air pollutants from motor vehicles.
- Dust from quarry operations in the Upper portions of the Kapa'a valley are noticeable on days when strong trade winds from the North-East are absent. Based on conversations with tenants of the Kapa'a Light Industrial Park, there seems to be a considerable dust problem originating from the quarry operations in the Upper Kapa'a valley.

- Some dust is set free by the outdoor equipment storage and building material processing activities which are presently ongoing on within the existing warehouse development in parcels TMK 4-2-15:013.
- Potential organic waste decomposition in the landfills could generate methane. We express "potential" since methane emissions from the Upper or Lower portions of the project site have not been confirmed.
- Periodic fugitive dust from intermittent grading operations in the Upper and Lower sites.
- Fumes from paint, varnish, aerosol sprays and other solvents used in industrial and commercial activities in the Kapa'a Valley.

Relevant natural sources of air pollution in the area include dust emitted from areas of land with little or no vegetation cover. Past land use in the area has resulted in extensively denuding the site of natural vegetative cover, facilitating erosion and soil loss.

In addition to release of airborne pollutants directly to the atmosphere, indoor air pollution is an increasingly important aspect to characterize the impact of air pollutants to occupants of buildings. Low Indoor Air Quality (IAQ) is generally attributed to poor ventilation and the elevated internal release of pollutants such as building materials emitting gaseous ingredients, paints and solvents emitting volatile organic compounds (VOCs), particulates and carbon monoxide. In addition, biological agents, either produced in the buildings or introduced by the ventilation system of imported materials, can accumulate in buildings, and can cause significant health risks for the occupants.

Possible problems with indoor air quality in existing warehouses at the proposed site of the Kapa'a Light Industrial Park could result from older warehouse construction technology and inappropriate handling of materials. Indoor air pollution is an important consideration for the new warehouse development with environmentally friendly construction and operation.

3.6 Noise Characteristics

Section 3.6 of the 2011 FEIS described noise characteristics at the site. There have been minor changes in the type and scope of noise generated by different sources.

The 2011 FEIS defined noise pollution as displeasing human or machine-created sound that has negative effects on human beings or animal life. The main current sources of noise at/near the proposed site have been vehicular traffic, industrial and commercial activities and noise generated by recreational activities, mainly from model airplanes operated from the Kawainui Model Airplane Field. In the past six years, noise from construction activities have added to the noise environment.

The sources of noise in the vicinity of the proposed sites are augmented by distant noises, such as traffic noises from the H3-Freeway, noise from aircraft passing the site, and noise from the urban developments in the north, west and south of the Kawainui Marsh.

Current noise levels at the site are caused by traffic passing the site on the Kapa'a Quarry Road and the Kapa'a Quarry Place roadways. Additional sources of noises are caused by light industrial activities and the operation of heavy vehicles for construction related tasks.

The main recreational activities in the vicinity of the proposed project site are associated with operating model airplanes, an activity that inherently produces a certain level of noise since small, high-pitched engines are used in the model planes.

Wildlife can be affected by elevated noise levels through interference with their use of sounds in communication and by causing stress. The main result of elevated noise on the animal world might be a reduction of usable habitat. Elevated noise levels could cause migration of animals away from the source of noise. Habituation, a behavioral pattern that causes animals to become familiar with noise levels and activities, might mitigate the migration of animals away from the source, especially if the noise levels are at background levels and not sharp noise peaks.

3.7 Utility Infrastructure Existing Environment

Section 3.7 of the 2011 FEIS describes the existing infrastructure. In the past nine years parts of the infrastructure that serves the project site have been updated.

Figure 3.7.1 shows the existing infrastructure at the time the 2011 FEIS was approved. Figure 3.7.1 shows identifier (1) through (5) which indicate the major infrastructure components of the site. The infrastructure components are described and the changes relative to the 2011 FEIS are indicated below.

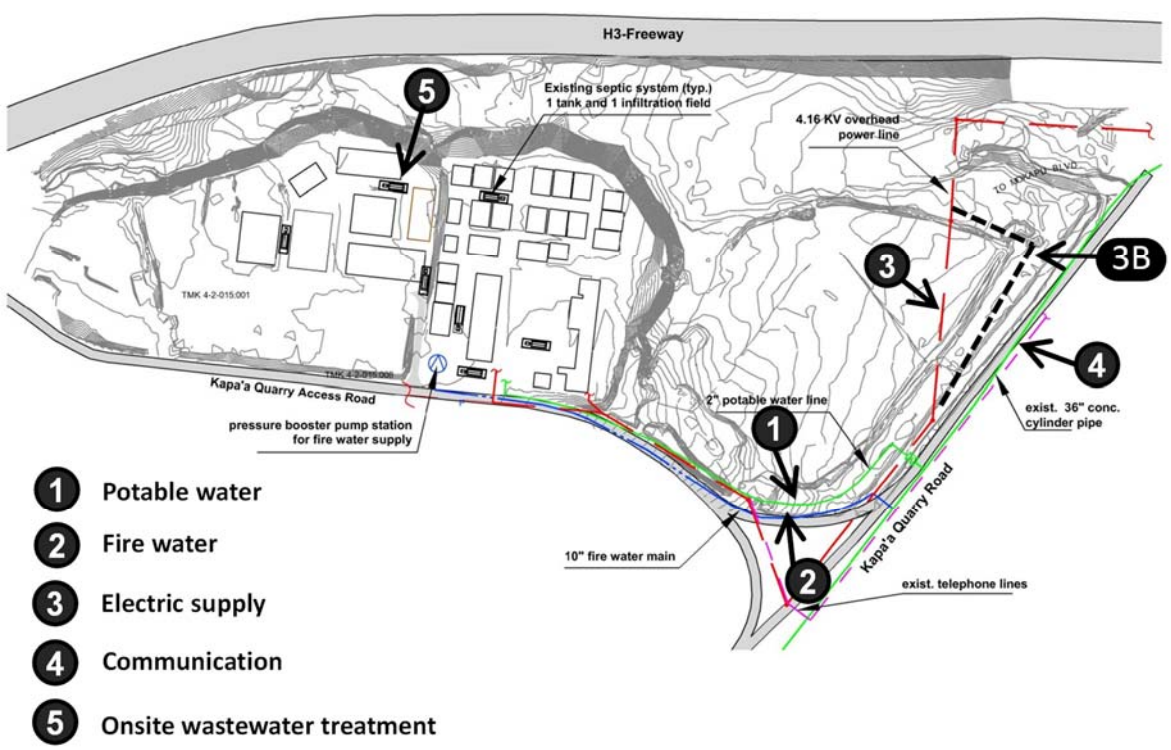


Figure 3.7.1: Utility infrastructure at the project site (source Figure 3-25 of the 2011, with annotations added)

The electric supply as indicated as (3) in Figure 3.7.1 needs a change in alignment. Currently the 4 kV powerline passes through the Lower site and needs to be removed and replaced with new poles outside the project site. The work of relocating the poles and conductors will be carried out by the Hawaiian Electric Company (HECO), including design, permitting and construction. Since the relocation project of the power line is an integral part of the project, the optional design concepts and the expected impacts to the environment and community are described in Appendix L of this FSEIS.

3.7.1 Existing Water System

The potable water infrastructure supplying potable water and firefighting water to the site was refurbished in 2018. Figure 3.7.1 indicates (1) the 2-inch potable water supply pipe and (2) the 10-inch fight fighting water pipes, which were both described in the 2011 FEIS. These two water supply pipes were connected to the existing 36-inch water main which runs along Kapa'a Quarry Road was removed.

In 2018 these two supply pipes were removed and replaced by a 12-inch water supply pipe that provides both potable water and firefighting water to the Upper site. The new 12-inch water supply pipe terminates at the Upper site perimeter and connects to the existing potable pipe distribution system as well as to the existing firefighting distribution system. The previous fire pump station remains in place. The fire pump boosts the water pressure if firefighting water is needed in the Upper site. The firefighting water demand is 4,000 gallons per minute for a three-hour fire.

3.7.2 Existing Wastewater System

The 2011 FEIS stated that project site was not connected to the municipal sewer system since there is no gravity sewer or forced wastewater main serving the property or along the Kapa'a Quarry Road. At the present, the project site remains disconnected to the sewer system and there are no plans to create a sewer connection in the future. The possibility of connecting the project site to the nearest sewer under the Mokapu Avenue with an approximately 2-mile-long small sewer pressure line was investigated during an earlier environmental review, but it was found that such a solution would not be feasible. Beside the technical obstacles of installing and maintaining the pressure line through third-party land, the end of line sewer pipe which would have to accommodate the sewage generated at the project site did not have the capacity to accommodate the quantity of sewage.

Figure 3.7.1 indicated as (5) the onsite wastewater treatment system at the time the 2011 FEIS was approved. As illustrated in Figure 3.7.1 there were seven conventional septic systems installed in the Upper site, each having one 1,250 gallons septic tank and one infiltration field (leach field) with average dimensions of 60 feet in length, 20 feet in width and 4 feet in depth. The sludge collected in the septic tanks was removed by private service companies semiannually, on average. In the years since the 2011 FEIS two more conventional septic system were added. All the nine conventional septic systems currently existing were permitted as Individual Wastewater Systems (IWS).

Changes in the onsite wastewater regulations promulgated by the State of Hawaii Department of Health (DoH) made it compulsory to connect only one building to one IWS. With a maximum number of 15 IWS for a project site an alternatives to conventional septic systems as IWS had to be selected. The selection was made to use a Water Treatment Work system composed of multiple Membrane Bioreactor (MBR)

units. Each MBR system can be connected to multiple buildings. The MBR technology that was selected is a National Sanitation Foundation (NSF) 350 standard certified technology which treats the wastewater to such a degree of residual pollutants that the effluent can be used as recycled water for external uses, such as irrigation.

At the present time, a pilot project is being conducted in cooperation with the DoH to test the first two MBR units at the site. The treated wastewater effluent from the two MBR units is disposed of in two new infiltration fields. The two infiltration fields have the capacity to accommodate all the wastewater generated in the Upper site once the conventional septic systems are converted to the advanced MBR technology and discharge into the two infiltration fields. Presently there are no onsite wastewater systems within the Lower portion of the site. For the full build-out wastewater system in the Lower site it is planned to use multiple units with NSF 350 certified MBR technology. It is planned to either use the treated wastewater effluent for irrigation or infiltrate it at the site perimeter.

3.7.3 Existing Electricity and Communication

Figure 3.7.1 shows the electricity and communication infrastructure (3) and (4) that was in place at the rime off the 2011 FEIS. The same infrastructure components are still in place, but it is planned to reroute the electric power line (3) to an alignment that goes outside of the Lower site perimeter site. The rerouting will be required to continue with the development of the Lower site. The future planned alignment of the power line is indicated as (3B) in Figure 3.7.1.

At present, existing users of electricity within the project site as well as other industrial users in the Kapa'a Valley are supplied via a HECO 4.16 kV line that connects to one circuit on Mokapu Blvd. Figure 3.7.1. shows the alignment of the 4.16 kV line. From Mokapu Boulevard, the power line first runs southwest parallel to the H3-Freeway and then changes direction to the southeast. The line crosses the Lower portion of the project site 006 and then runs parallel to the Kapa'a Quarry Road to the intersection of Kapa'a Quarry Access Road and Kapa'a Quarry Road. From there the power line again changes direction and runs westward along the Kapa'a Quarry Access Road to serve consumers of electric power in the Kapa'a Valley.

The existing 4.16 kV is the only electricity supply line to the Kapa'a Valley. Communications with HECO about the rerouting of the power line suggested that with installation of newer power supply technology with more capacity can be brought to the project site so that future increases in demand can be satisfied. Section 3.7 states that the concept design and related impacts to the environment and the community are described in more detail on Appendix L of this FSEIS.

3.8 Existing Transportation Environment

Section 3.8 of the 2011 FEIS described traffic related conditions. In the time since the 2011 FEIS there have been several traffic related changes.

This section 3.8 of this SEIS describes the existing transportation system serving the proposed project site, including the local roadway network, traffic conditions, public transportation, parking and pedestrian and bicycle circulation.

3.8.1 Roadway Network

Figure 3.8.1.1 illustrates the roadway network that connects the project site to the Kailua and Kaneohe regions. The project site is situated just south of John A. Burns Freeway (H3 Freeway) within Koolau Poko district of the Island of Oahu. The Kapa'a Quarry Road, a County road, connects the Kapa'a Valley with the State highways Mokapu Blvd. and Kalanianaole Highway. The Kapa'a Quarry Place is a dead-end road which connects the industrial land uses in the Kapa'a Valley, including the project site, with the Kapa'a Quarry Road.

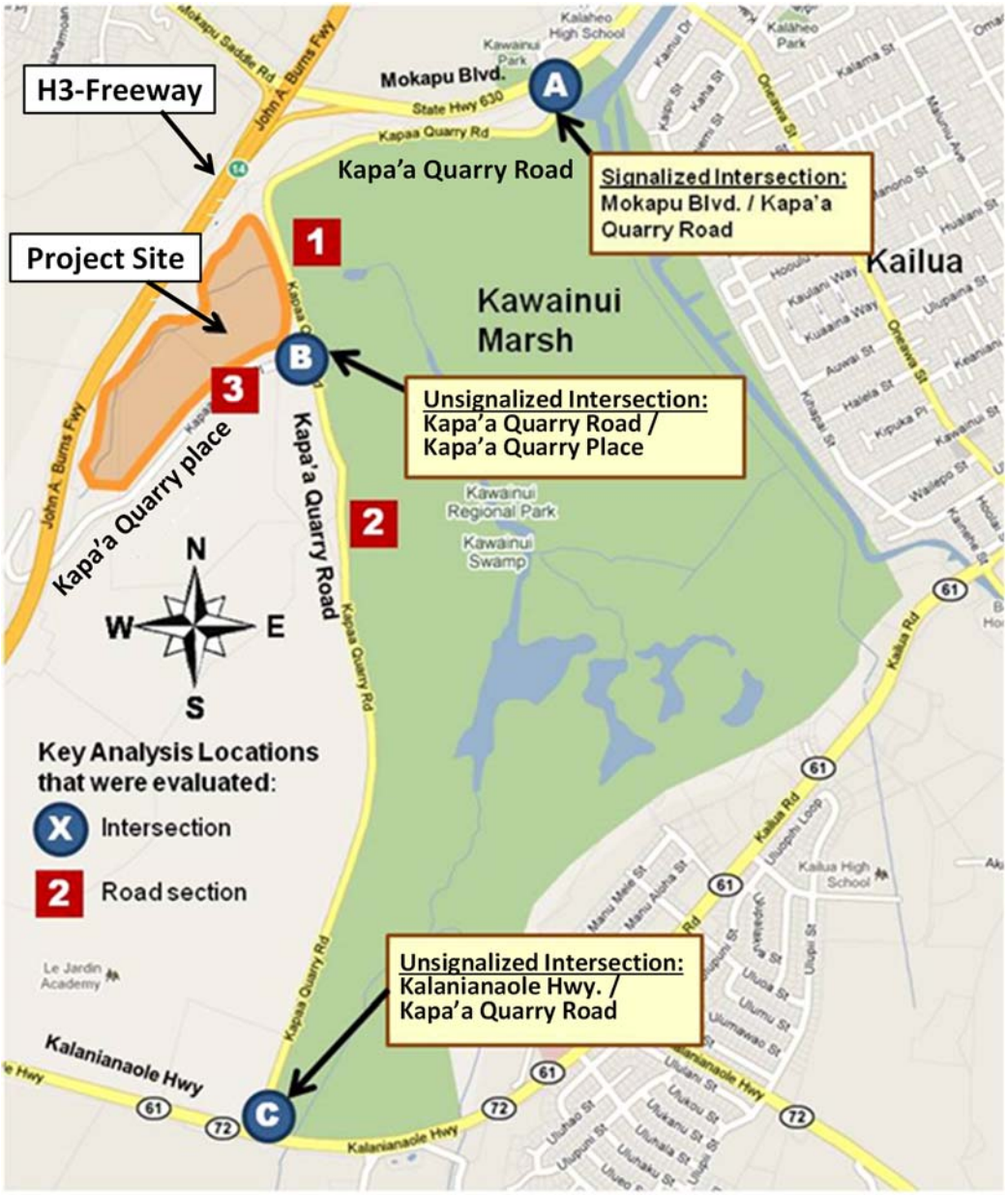


Figure 3.8.1.1: Illustration of the roadway network that connects the project site to the Kailua and Kaneohe regions.

The Kapa'a Quarry Road is a Class II roadway. The length of the two-lane road is 2.5 miles, and the lane-width is 12 feet, on average. The road connects the proposed site and other facilities in the Kapa'a Valley to the regional roadway network South and North of the Kawainui Marsh. The Kapa'a Quarry Road runs along the western boundary of the Kawainui Marsh. Besides providing access to the Kapa'a Valley, the road is also a popular shortcut road, connecting the two major roads, the Kalanianaole Highway, in the south and the Mokapu Boulevard, in the north. Vehicles traveling on the Kapa'a Quarry Road between Kalanianaole Highway and Mokapu Boulevard can bypass roads in Kailua and Kaneohe.

The Kapa'a Quarry Place is a Class II roadway. The length of the two-lane road is 0.7 miles, from the intersection with Kapa'a Quarry Road to the terminus of the road, which is the gate to the Ameron quarry. The lane-width is 12 feet, on average. The road intersects with the Kapa'a Quarry Road and connects the installations in the Kapa'a Valley with the Kapa'a Quarry Road. (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

The main commercial, industrial, and recreational activities that generate current traffic volumes on the Kapa'a Quarry Place are as follows:

- Ongoing quarry and landfill operations (heavy truck traffic)
- Kapa'a Refuse Transfer Station (heavy truck traffic)
- Existing warehouses on parcel TMK 4-2-015:013 and 014 (Upper site)
- Equipment storage on parcel TMK 4-2-015:014 (Lower site)
- Model Plane Recreational Park (opposite the intersection of Kapa'a Quarry Road and Kapa'a Quarry Access Road

3.8.2 Key Analysis Locations

Figure 3.8.1.1 indicates the key analysis locations used in a traffic impact assessment report that was conducted for the 2011 environmental review. The TIAR evaluated the existing traffic conditions at the site and predicted the future increase in traffic resulting from the proposed project.

Table 3.8.2.1 describes three intersections located in the vicinity of proposed site. As described in Figure 3.8.1.1 two intersections are signalized and one is unsignalized. Table 3.8.2.2.describes the three roadway segments, two on the Kapa'a Quarry Road and one on the Kapa'a Quarry Access Road. (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

Table 3.8.1.1: Three intersections which are affected by the project site (source table 3-8 of the 2011 FEIS)

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

Table 3.8.2.2: Roadway sections evaluated (source Table 3-9 of 2011 FEIS)

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

3.8.3 Traffic Volume Assessment Based on a 2010 TIAR

A 2010 Traffic impact assessment was conducted for the 2011 FEIS. The Applicants have committed to conduct a new TIAR once the site development plans for the entire project site have been approved. The results of the TIAR were reported in the 2011 FEIS.

The following is a brief summary of the 2010 TIAR for the Level of Service:

- The level of service for the three intersections is shown in Table 3.8.3.1.
- The level of service for the three roadway sections in Table 3.8.3.2.

Table 3.8.3.1: Level of service for the three intersections (source Table 3-10 of 2011 FEIS)

ID	Intersection location	type of signal	Level-of-service LOS	
			AM Peak	PM Peak
A	Mokapu Blvd. & Kapa'a Quarry Road	signalized	B	C
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	B**	B**
C	Kalanianaole Hwy & Kapa'a Quarry Road	signalized	B	B

Note B**: The LOS for the unsignalized intersection reflects the minimum of LOS for the movements of the intersection

<u>The Level-of-Service Concept:</u> Level of service (LOS) is a common way of defining intersection and roadway capacity. In this approach, LOS ratings range from A to F, where A represents minimal delays and F represents roadways and intersections that operate over capacity, resulting in excessive delays with longer queues due to over-saturated conditions. Generally, LOS ratings of A – D are acceptable while E, which is approaching capacity, is either acceptable or not depending on the jurisdiction. Level F, which represents severe congestion and is thus over capacity, is always unacceptable. Level D is typically

considered acceptable for peak hour conditions in urban areas; the proposed site is located within the urban distinct.

Table 3.8.3.2: Existing level-of-service for roadway sections (source Table 3-9 of 2011 FEIS)

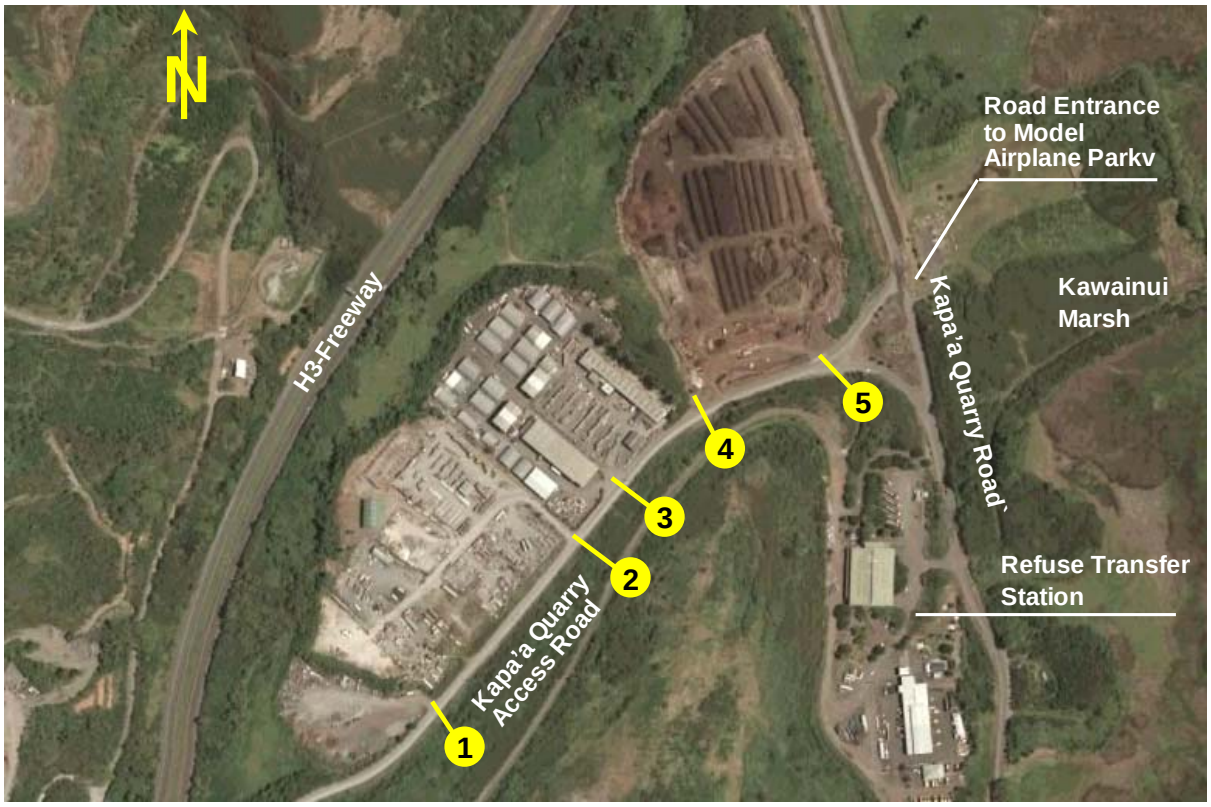
Nr.	Roadway sections locations	Level-of-service LOS	
		AM Peak	PM Peak
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	C	B
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	B	B
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	B	B

3.8.4 Existing Roadway Access to the Proposed Site

Section 3.8.7 of the 2011 FEIS described the existing road entrances to the project site. Figure 3.8.4.1 shows the five road entrances which existing at the time the 2011 FEIS was approved. The locations of the five roadway accesses are still the same. One of the road accesses, Entrance No. 1, has been upgraded since the 2011 FEIS was approved. The five road entrances as shown in Figure 3.8.4.1 are describes as follow: (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

At the present, the project site is accessed from Kapa'a Quarry place roadways with five road entrances, as shown in Figure 3.8.4.1 .

- Entrance No. 1 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Upper site). This was an unpaved entrance at the time the 2011 FEIS was approved. This road entrance was improved after the 2011 FEIS was approved and is now a wide and paved entrance.
- Entrance No. 2 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:013. This is a paved entrance. This paved entrance provides access to existing warehouses and outdoor equipment storage areas in the south-western part of parcel TMK 4-2-015:013.
- Entrance No. 3 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:013.
- Entrance No. 4 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Lower site). This is an unpaved entrance.
- Entrance No. 5 provides access from to the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Lower site). This is an unpaved entrance.



X = No. of Present Road Entrance to Proposed Site

Figure 3.8.4.1: Road entrances to the proposed site (source Figure 3-28 of the 2011 FEIS)
(Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road)

3.8.5 Public Transportation

Section 3.8.8 of the 2011 FEIS described the publication transportation system that served the project site. The bus routes have changed since the 2011 FEIS.

At the present there is still no public transportation service to the project site. The nearest bus stop is on Kalanianaole Highway at the intersection with Auloa Street, for both westbound and eastbound buses. This bus stop is 1.3 miles from the proposed site. This bus stop is served by one lines of TheBus.

3.8.6 Off-street Parking

Section 3.8.9 of the 2011 FEIS described the off-street parking at the site. The approach of providing off-road parking at the project site has not changed since the 2011 FEIS. Parking at the projects is entirely on off-street parking spaces provided by the Applicants for the warehouse development. The number of parking spaces is concurrent with the applicable city ordinances of one parking space per 1,500 square feet of industrial space. (Revised Ordinances of Honolulu (ROH) Chapter 21 "Land Use Ordinance", Article 6 "Off-Street Parking and Loading")

3.8.7 Pedestrian and Bicycle Facilities and Circulation

Section 3.8.10 of the 2011 FEIS described issues related to pedestrian and bicycles traffic to and from the project site. The conditions in the 2011 FEIS remain in place and there are no changes.

The 2011 FEIS stated that there was negligible pedestrian activity around the proposed site. The Kapa'a Quarry Road does not have dedicated sidewalks or even shoulders and therefore walking of biking along the roadway is not considered pleasant or safe.

The Kapa'a Quarry Road is, in sections, fringed by trees with thick foliage which produce shade and sometimes dim lighting conditions. Furthermore, the road has several turns and dips, which affect visibility.

The potential Kawainui marsh perimeter pathway, possible under the present planning for the march improvements could provide a safe and pleasant venue for both bikers and pedestrians to reach the proposed site from Mokapu Blvd. and Kalanianaole Hwy. But plans related development plans have been in the planning for many years without concrete construction plans being made.

Plans by the Applicant for 2,500-foot roadway frontage improvements on the Kapa'a Quarry Place along the project site were approved by the DPP. The improvements include 8-foot-wide sidewalks separating the project site from the roadway. Of these 2,500 feet 1,300 feet have already been completed. The remaining 1,200 feet will be completed in conjunction with the development of the Lower portion of the project site.

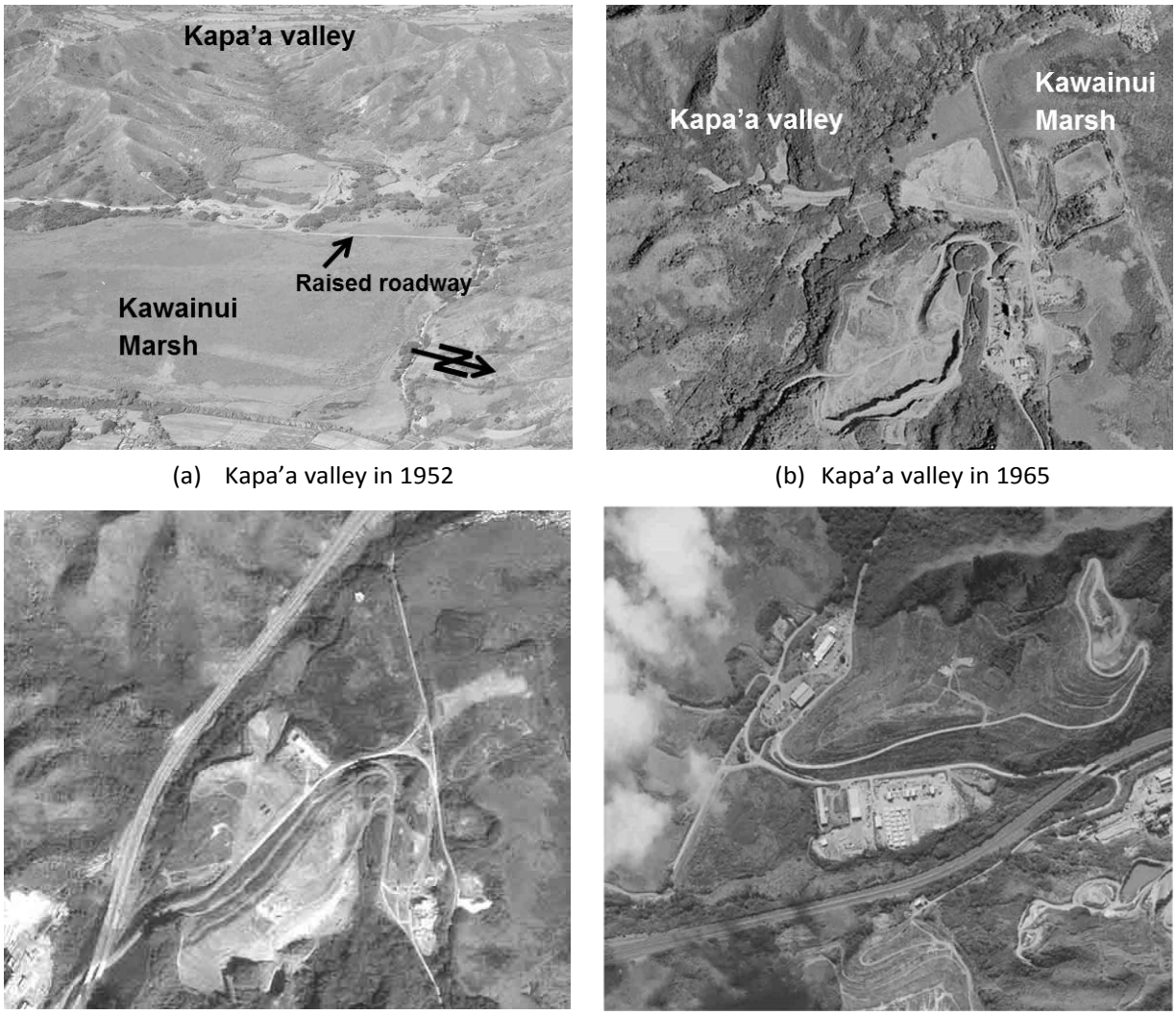
3.9 Existing Views of Proposed Site

Section 3.9 of the 2011 FEIS described existing views at the project site. External views have since then changed as more vegetation cover around the project site has grown obstructing direct views on the project from various locations. A comprehensive visual impact assessment of the project site using recent photographic and line-of-sight drawings is presented in Section 6.6 of this Draft SEIS.

The 2011 FEIS stated that Industrial and commercial activities had significantly affected the appearance of the Kapa'a Valley where agriculture and cattle ranching once thrived until the late 1940s. The topography of the valley has been significantly affected by quarry and landfill operation, which started about 60 years ago. The deep changes in the appearance of the valley included large quantities of earth moving, exposed rock formations, large quarry or landfill equipment, warehouse structures and the refuse transfer station in the Lower and southern. Construction of the H3-Freeway further resulted in major changes in the appearance of the valley.

Several views of the site and adjacent land are presented hereafter to exemplify the appearances of Kapa'a Valley and the project site the proposed site. Significant portions of the valley have been converted from agricultural land use to industrial land use. These industrial operations have contributed to changes in topography in the valley, with vegetation of larger parts of the valley being removed and converted to quarries and landfills. A series of aerial photos, Figure 3.9.1 (a) through (d), portrays changes in land use and character of the Kapa'a Valley over the past six decades. Figure 3.9.1 (a) shows Kapa'a valley in 1952. The main land use in the Lower reaches of Kapa'a valley was agriculture. A raised roadway, being built in the 1940s, separated the Kapa'a Valley from the Kawainui Marsh. Figure 3.9.1 (b)

shows Kapa'a valley in 1965. Significant land area in the valley was converted to quarries and landfills. Agricultural land, stream channel and wetland areas were covered with refuse and/or quarry tailings and overburden. Figure 3.9.1 (c) shows the valley in the year 1976. The landfill and quarry operations had expanded and occupied more land. Some of the landfill operations were completed. Figure 3.9.1 (c) shows the work on the H3-Freeway underway. Figure 3.9.1 (d) shows the valley in the year 1993, when parts of the former quarry and landfill areas in the Lower parts of the valley were completed, and vegetation can again be seen covering parts of the former disturbed land areas.



(a) Kapa'a valley in 1952 (b) Kapa'a valley in 1965

(c) Kapa'a valley in 1976 (d) Kapa'a valley in 1993

Figure 3.9.1: Four views of the Kapa'a Valley showing the change in appearance over the years

Figure 3.9.2 shows the Lower portion of the Kapa'a Valley in its appearance at the time the 2011 FEIS was approved. The former quarries and landfills have been either vegetated or converted to other land uses. This figure shows the proposed project site, with the existing warehouse development and graded land areas in the Upper and Lower portions of the site. Figures 3.9.3 shows four adjacent views of the project site at the present.

Figure 3.9.2: Lower portion of the Kapa'a Valley at the time the 2011 FEIS

(a) View from Kapa'a Quarry Road, the Lower portion of the project site is on the left

(b) View from Kapa'a Quarry, the Lower portion of the project site is on the left

(c) View from Kapa'a Quarry Place, the Lower portion of the project site is on the right

(d) View from Kapa'a Quarry Road, the Upper portion of the project site is the right

Figure 3.9.3: Four adjacent views of the project site at the present

3.10 Land Use and Zoning Existing Environment

Section 3-10 of the 2011 FEIS described historical and existing land uses and the existing land use zoning of the proposed site and surrounding land. There have been minor changes, mostly project related issues.

3.10.1 Land Use

The 2011 FEIS described that the Kapa'a Valley where the project site is located has been subject to significant commercial and industrial developments during the past fifty to sixty years. Historically, agriculture was the prime land use in the Kapa'a Valley from the time of early settlement of the Hawaiian Islands through the mid 1900's. For example, cattle ranching operations were important in Kapa'a Valley until the late 1940's.

Quarry operations started in the valley in the early 1950's. This significantly changed the primary land use and the general appearance of the valley. The lower plateaus of the valley significantly changed appearance as the quarry operations expanded. While the lower stretches of the valley were agricultural landscapes, this land was converted to serve industrial uses. Significant deposits of quarry tailings and overburden altered the topography of the valley. One of the overall changes of the valley was a raised roadway that subsequently became the Kapa'a Quarry Road. The roadway ran across the valley mouth of the Kapa'a valley and segregated the Kapa'a watershed from the Kawainui Marsh. While the Kapa'a watershed previously drained into the marsh through numerous water conveyances, the drainage of the watershed became concentrated to a limited number of openings through the raised roadway. The Kapa'a Stream subsequently acquired the present streambed, which is located between the landfill plateau created by landfill deposits and the H3-Freeway raised roadway. It has been observed in even current geographic maps that the streambed of the Kapa'a Stream is still shown going through the Lower portion of the project site, although the stream bed has been shifted towards the North by several hundred feet.

The 1960's and 1970's brought about an increase in quarry related activities to the area. As quarry operations ceased in different locations, due to the end of cost-effective processing, municipal solid waste landfill operations followed in its place. A large municipal landfill was operated in the valley through 1990. Today, there are still municipal waste related activities going on in the valley, though not in the form of landfills but in form of the Kapa'a Refuse Transfer Station, where waste collected in windward communities is transferred to larger transfer vehicles and is then transported to the leeward site of Oahu. Construction of the H3-Freeway and the associated earth moving, and mass grading introduced another significant change to the Kapa'a Valley starting in the 1970's.

In the mid-1970's, the development of an industrial park in the Lower stretches of the valley started with the construction of several warehouses on land that was created by landfill deposits. This land is now the Upper portion of the project site. The number of warehouses has continuously increased over the years in response to a strong demand for industrial warehouse space in the Kailua and Kaneohe regions.

In summary, the Kapa'a Valley has been subject to intensive industrial activities over the past decades, which have caused significant impact on the environment. Earth moving and deposition activities have changed the original natural topography and visual vistas. Noise and air pollution have been introduced to the area due to land filling and other commercial and industrial activities. And finally, surface run off and erosion have contributed to degradation of water quality in Kapa'a stream. Although the proposed Kapa'a Light Industrial Park would expand the existing warehouse development by about twice the present size, the proposed warehouse park would not significantly increase the general industrial characteristics of the entire Kapa'a Valley.

3.10.2 City and County of Honolulu Land Use Zone Designation

The 2011 FEIS described the zoning of the project site as three contiguous parcels of land. Two of which, TMK 4-2-015:001 (portion of) and 4-2-015:006 were classified as General Preservation District (P-2). The third parcel, the then TMK 4-2-015:008 was classified as Intensive Industrial District (I-2). Figure 3.10.2.1 shows the Location Map of the proposed site as described in the FEIS. Figure 3.10.2.2 illustrates the County land use zoning designations in the vicinity of the proposed site as shown in the 2011 FEIS.

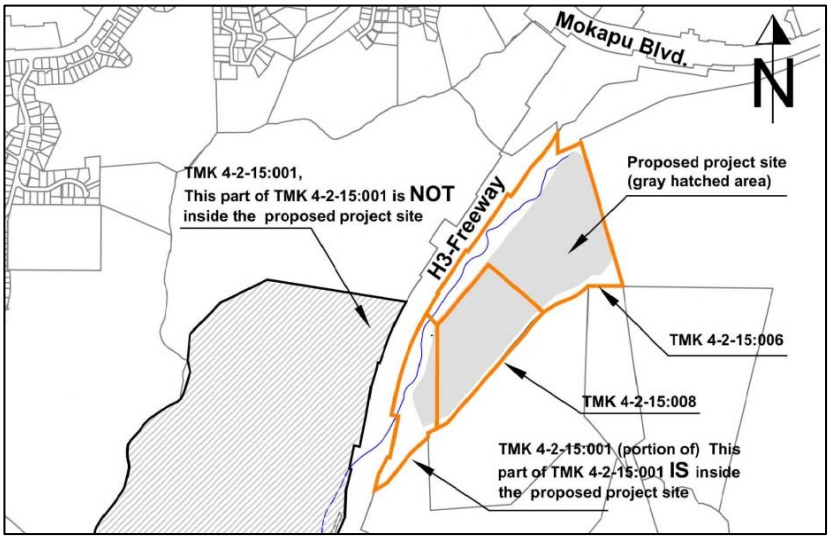


Figure 3.10.2.1: Location Map of the proposed site as described in the FEIS (source Figure 3-37 of the 2011 FEIS)

Note: Land Use Zoning Designations have been changed since the 2011 FEIS was approved .

Most of the land parcels in the vicinity of proposed project site are classified as either Restricted Preservation District (P-1) or General Preservation District (P-2).

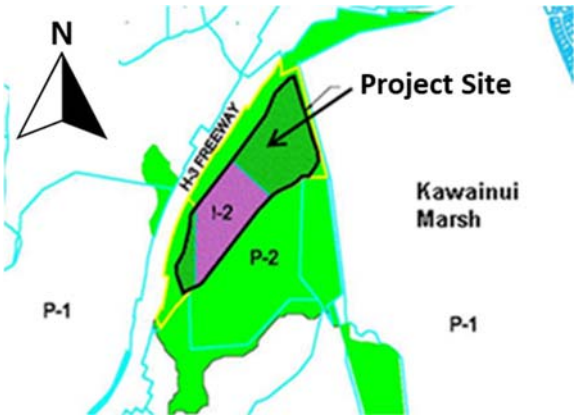


Figure 3.10.2.2: County land use zoning designations in the vicinity of the proposed site as shown in the 2011 FEIS
(source Figure 3-38 of the 2011 FEIS, new annotations added and size of imager changes)

Note: The 2011 FEIS described the project site to be inside the P-2 and I-2 County land use designations.

The City and County of Honolulu Zone Change ordinance 13-83 changed the land use designations for two of the three parcels which create the current project site from P-2 to I-1 (limited Industrial). The two land parcels which were rezoned also changed their TMK designation. These two parcels were (1) the TMK 4-1-15:001 (portion of) which was subsequently rezoned as 4-2-15:012 and a portion of the 4-2-15:014 and, (2) the TMK 4-2-15:006 was rezoned to 4-2-15:014 (portion of). The presently valid TMK designations of the parcels are depicted in the Figure 3.10.2.3.

The rezoning of the two parcels did not change the entire parcel land use designation - only the land that would finally become the project site was rezoned. The boundaries of the rezoning followed the topographic conditions at the project site, where the rezoned land only included that land that was former landfill area. The land inside the two parcels that had dense vegetation and included the Kapa'a Stream corridor was not rezoned.

Figure 3.10.2 .3shows the current County land use designations of the TMKs 4-2-15:013 and 014.

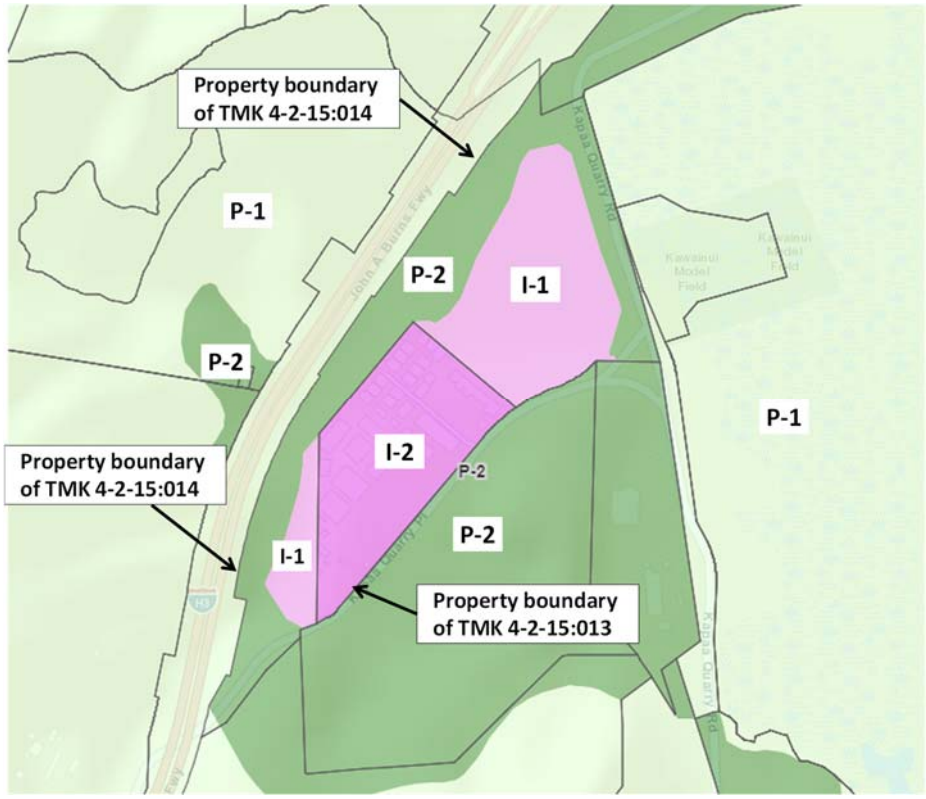


Figure 3.10.2.3: Current land use designation of the project site and adjacent land

(source DPP GIS)

3.10.3 State Land Use Classification of Proposed Site

Section 3.10.3 of the 2011 FEIS described the State land use districts at the project site. There have been no changes to the limits of these State land use district boundaries. Figure 3.10.3.1 shows the current State land use district boundaries at the project site.

All lands in the State of Hawaii are classified into one of four land use districts: Conservation, Agricultural, Rural and Urban Districts. Urban districts include lands that are now in urban land use or

represent a sufficient reserve area for foreseeable urban growth. Urban districts allow certain land use activities which are regulated by ordinances of the counties. The project site is within State Urban District. A small, less than one-acre portion in the southwest of parcel TMK 4-2-015:014 is within the State "Conservation" District. This small portion of parcel TMK 4-2-015:014, however is not part of the project site and has remained open space.

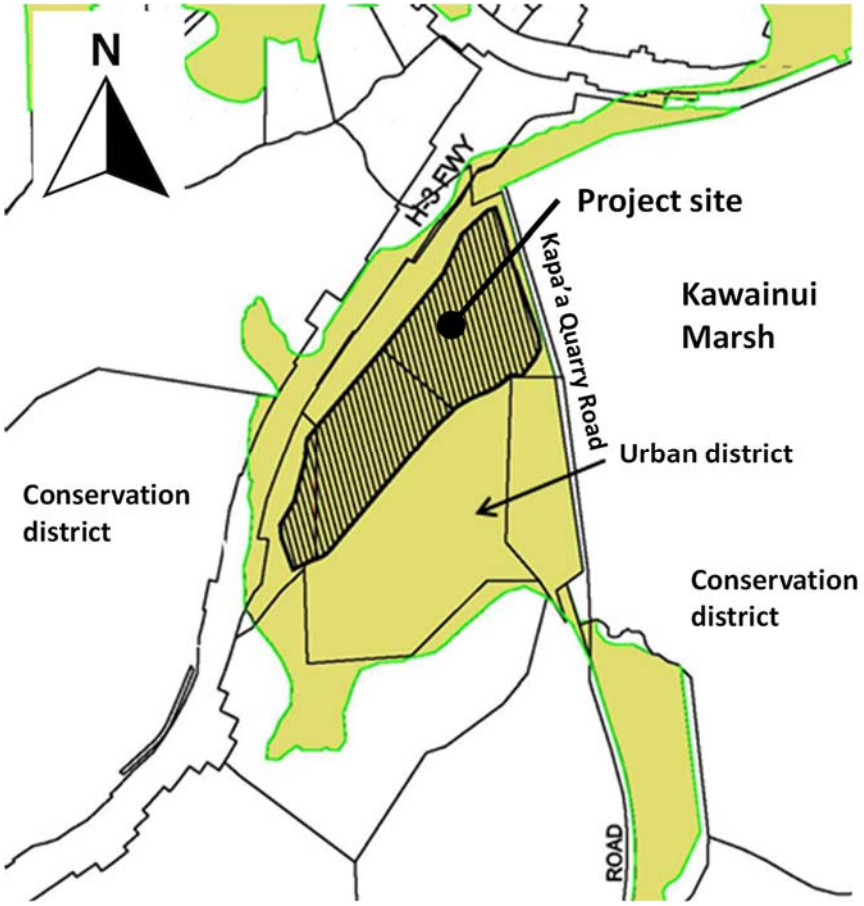


Figure 3.10.3.1 State land use district boundaries at the project site.

(source Figure 3-39 of the 2011 FEIS, new annotations added and size of imager changes)

Legend:

	Within Urban District
	Within Conservation District

3.10.4 Special Management Area

Section 3.10.4 of the 2011 FEIS described the Special management Are (SMA) boundaries. There have been no changes in the SMA boundaries since the 2011 FEIS was approved.

Hawaii Revised Statutes (HRS) Chapter 205-A regulates land use in Special Management Areas (SMA). As depicted in Figure 3.1.0.4.1, the Lower portion of TMK 4-2-15:014, including all the project site, is within the SMA District. Therefore, the proposed development is subject to regulatory procedures, permit requirements, and review under the City's SMA regulations. Specifically, special management area use permit (SMP) coverage, must be obtained for any development work. For the project site, SMP permit No. 2014/SMA-27 as well as two minor modifications have been obtained.

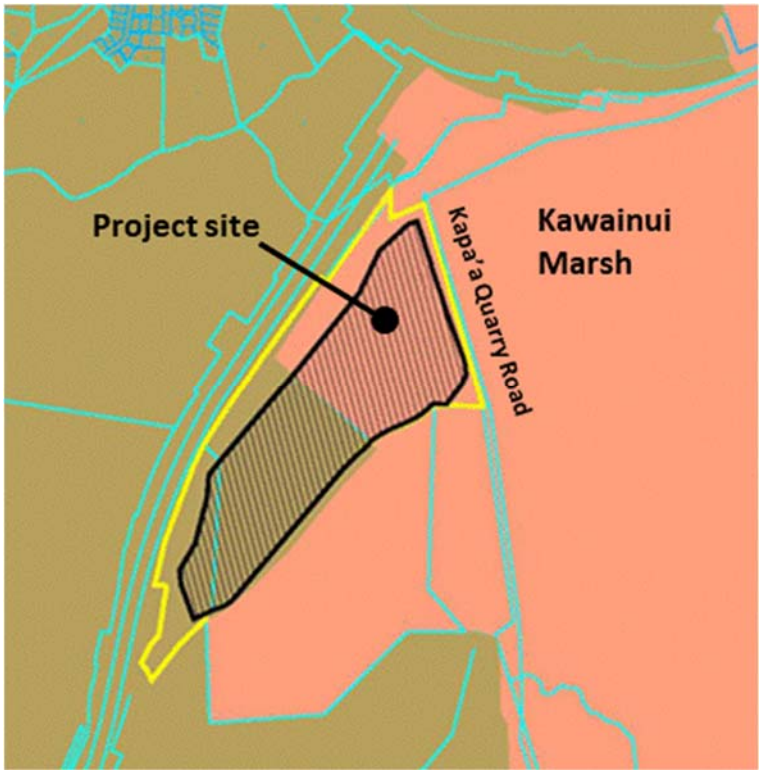


Figure 3.10.4.1 Special Management Area (SMA) district in vicinity of project site

(source Figure 3-40 of the 2011 FEIS, new annotations added and size of imager changes)

Legend:

Area inside the SMA boundary

Area outside the SMA boundary

3.10.5 Land Uses Surrounding the Proposed Site - Kawainui Marsh

Section 3.10.5 of the 2011 FEIS described the Kawainui Marsh is the largest wetland in the Hawaiian Islands with a total area of the marsh and associated wetland areas of approximately 850 acres. The cultural and ecological importance of the Kawainui March has not changed, and the community has supported planning and actual implementation of initiatives to support the cultural and ecological health of the Kawainui Marsh. In the time since the 2011 FEIS was approved, the Applicants have supported community efforts by either providing financial assistance or actively contributing to clean-up efforts at the marsh perimeter.

In 2005 the Kawainui Marsh, together with the Hamakua Marsh Complex, was introduced into the international Ramsar List, a list of Wetlands of International Importance. According to the Ramsar guidelines, " wetlands included in the list acquire a new status at the national level and are recognized by the international community as being of significant value not only for the country, or the countries, in which they are located, but for humanity as a whole…".

Approximately 4,000 years ago, the marsh was an inland sea, which was divided from the ocean by a sediment barrier. The marsh accommodated a large fishpond and an agricultural field system that sustained the Hawaiian population in the area. The marsh is part of the ahu pua'a of Kailua, a section of land that stretched from the mountains to the ocean and encompassed a diversity of natural resources, which supplied the life essentials of the Hawaiian population.

The marsh played an important role in the Hawaiian culture. It supported a 400-acre fishpond and an agricultural field system that provided to the people. Several heiaus and other gathering places were constructed in the area. Several of them are preserved to date and provide a rich educational and cultural experience to the people living and visiting the area. Most of the cultural assets are located in the southern part of the marsh, approximately 2 miles away from the site, on average.

A rich diverse wildlife of birds, fish and aquatic animals use the Kawainui Marsh as their natural habitat. The marsh is also habitat for the federally endangered Hawaiian stilt, Hawaiian moorhen, Hawaiian coot, and Hawaiian duck as well as populations of protected migratory waterfowl and shorebirds. The extent of the natural habitat for wildlife has been shrinking in the marsh due in part to a decrease of open water area caused by sedimentation and encroachment of non-wetland vegetation. Measures to restore important wetland throughout the marsh have been ongoing, though at various levels of scope and intensity. The goal of such efforts is restoring the capacity of the marsh to serve as quality wildlife habitat and effective flood control.

The marsh plays an important hydrological function for the Kailua watershed. During heavy stormwater events, runoff, associated suspended solids and nutrients are held back in the marsh resulting in Lower runoff impacts on Kailua Bay. Four decades of increased urbanization of the Kailua watershed increased soil erosion and sedimentation that have resulted in a decreased usable volume of the marsh and its ability to hold back water. Increased influx of nutrients into the marsh has caused an increase of free-flowing vegetation that has resulted in a decreased amount of free water surface.

The Kawainui Marsh has been an important area for recreation and repose for the population of Kailua, the Windward community and Oahu as a whole. Several recreational parks rim the marsh. A Model Airplane Field at the north-eastern edge of the marsh provides recreational opportunities for fans of model flying aircraft. The marsh furthermore offers scenic views of wetlands and mountains.

3.10.6 Land Uses Surrounding the Proposed Site - Kawainui Marsh Development Plans

Section 3.10.6 of the 2011 FEIS described efforts to develop features which would make the Kawainui Marsh more accessible. Specifically, the 2011 FEIS described the possible construction of a multifunctional pathway, e.g., a combined pedestrian walkway and bikeway around the perimeter of the Kawainui Marsh. Efforts are ongoing to install such a pathway. Regarding benefits to the project site a pathway would support the accessibility of the project site via other means than individual vehicles, thus making the site more accessible through pedestrian and bicycle traffic.

Currently, the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) is updating the Master Plan for the Kawainui-Hamakua marsh Complex. The 1,000-acre project area was acquired by the State of Hawaii. The master plan is slated to support sustaining and enhancing its natural and cultural resources.

3.10.7 Land Uses Surrounding the Proposed Site - Kapa'a Valley

Section 3.10.6 of the 2011 FEIS described land uses in the Kapa'a Valley. There are minimal changes in the land use in the Kapa'a Valley, and changes have been due to the continuing development at the project site. But the basic premise of land use in the Kapa'a Valley has not changed since the 2011 FEIS was approved.

The 2011 FEIS described that the Kapa'a Valley had gone through many significant changes over the past centuries; from agricultural cultivation starting several centuries ago, when the valley was home to the first settlements, to cattle ranching and last to industrial uses.

In the middle of the last century, industrial uses started in the valley with quarry operations on the slopes of the Ulumawao ridge in the south of the valley. The quarry operations later expanded also to the Upper parts of the valley. A dike supporting a raised roadway was installed in the Lower part of the valley, which effective segregated approximately 40 acres of wetland from the Kawainui Marsh. This raised roadway became the Kapa'a Quarry Road. While quarry operations expanded in the valley, there still were farming activities ongoing in the valley.

The start of the quarry operations also resulted in the deposits of overburden and tailings on wetland areas on both sides of the raised roadway. The deposits on the makai (ocean side) side of the Kapa'a Quarry Road and located on the fringes of the marsh resulted in the creations of landfill area that today is used, among others, for the Model Airplane Park and a City & County of Honolulu base yard.

In the mid-1960s, the 40-acre wetland area was filled to become a landfill area, displacing the remaining farming operations from the Kapa'a Valley. The Upper half of the 40 acres became a refuse dump, which was eventually covered with quarry overburden, and the Lower half of the area was filled with quarry overburden to create an approximately level plateau. Due to the obstruction of the landfill, the Kapa'a Stream streambed changed, moved further to the north and assumed its present location.

In addition to the quarry and landfill operations in the Kapa'a Valley, the construction of the Interstate H-3 Freeway created another impact.

With ongoing and expanding quarry operations, larger portions of the valley were used for landfills. Landfill operations in the Lower stretches were completed in the mid-1970. The landfills were then used to start other industrial uses in the Lower stretches of the Kapa'a valley. About 26 acres of the area generated by landfill was converted to industrial land use and industrial warehouses over the past three decades.

3.10.8 Land Uses Surrounding the Proposed Site - Federal H3-Freeway

Section 3.10.6 of the 2011 FEIS described the background or the John A .Burns Freeway (H3-f=Freeway).

The H3-Freeway connects central Oahu with the windward side and is an important part of the freeway system on Oahu. The freeway is about 15 miles long and features a tunnel system of about one-mile length and numerous viaducts that elevate the roadways and support the freeway structure over significant lengths.

The idea of the linking central Oahu and the windward part of Oahu by the H3-Freeway was conceived as part of the Statehood Act and initial federal planning started in 1963 to select a route of the freeway. On the Honolulu side of the Koolau Mountain range, the initial design considered the Moanalua valley route. On the windward side the route of the H3-Freway passes through the Kapa'a Valley. By the year 1972 the construction of the freeway through the Kapa'a Valley was in full process.

In 1997, almost four decades after being proposed, the H3 opened. The H3-Freeway has become an important part of Oahu's freeway system. The construction of the H3-Freeway though the Kapa'a Valley has had considerable impact on valley and its watershed. The roadway crosses the valley in East-West direction and its embankment basically segregates the valley into a northern and southern part. Since the road embankment affects the drainage of the valley watershed, drainage openings had to be installed for the Kapa'a Steam and other smaller drainage ditches. In addition to affecting the watershed, the H3-Freeway has also altered the visual appearance in the valley and has caused other impacts, such as increased noise and light. The H3-Freeway is located directly adjacent to the project site.

3.10.9 Land Uses Surrounding the Proposed Site - Le Jardin Academy

As the 2011 FEIS described the Le Jardin School is a private school that has served the Kailua and Kaneohe region since its founding almost 50 years ago. The school has seen significant growth since and in 1999 the school campus moved to a new location at the intersection of Kalanianaole Highway and Kapa'a Quarry Road, at the site of the former Kailua Drive-in. The Le Jardin Campus is located 1.6 miles away from the site of the proposed industrial warehouse park. The Le Jardin School adds to traffic volume on the Kapa'a Quarry Road.

3.10.10 Land Uses Surrounding the Proposed Site - Kapa'a Refuse Transfer Station

Section 3.10.10 described the Kapa'a Transfer Station as a disposal and recycling facility for residential waste. The transfer station is located at the Kapa'a Quarry Road, south of the project site.

Type and capacities of the refuse facility have not changed significantly to date. There, however, have been plans to expand the facilities.

In 2019, the City and County of Honolulu started a project to improve green waste handling at the Kapa'a Transfer Station.

The transfer station serves the function of consolidated and transferred refuse from locally operating refuse collection trucks to larger hauling trucks, for cost effective transport of combustible and non-combustible refuse to the waste incinerators or landfills on the leeward side of the island, respectively.

The Kapa'a Transfer Station is open every day, including Saturday and Sunday. The transfer station is located about 0.4 miles away from the proposed site.

3.11 Population and Community Services and Facilities Existing Environment

Section 3.11 of the 2011 FEIS described socioeconomic characteristics of the existing environment within the Koolau Poko region.

3.11.1 Population Characteristics

Section 3.11.1 of the FEIS described population distribution and expected trends. Some of the data presented in the 2011 FEIS has been updated in recent governmental publications.

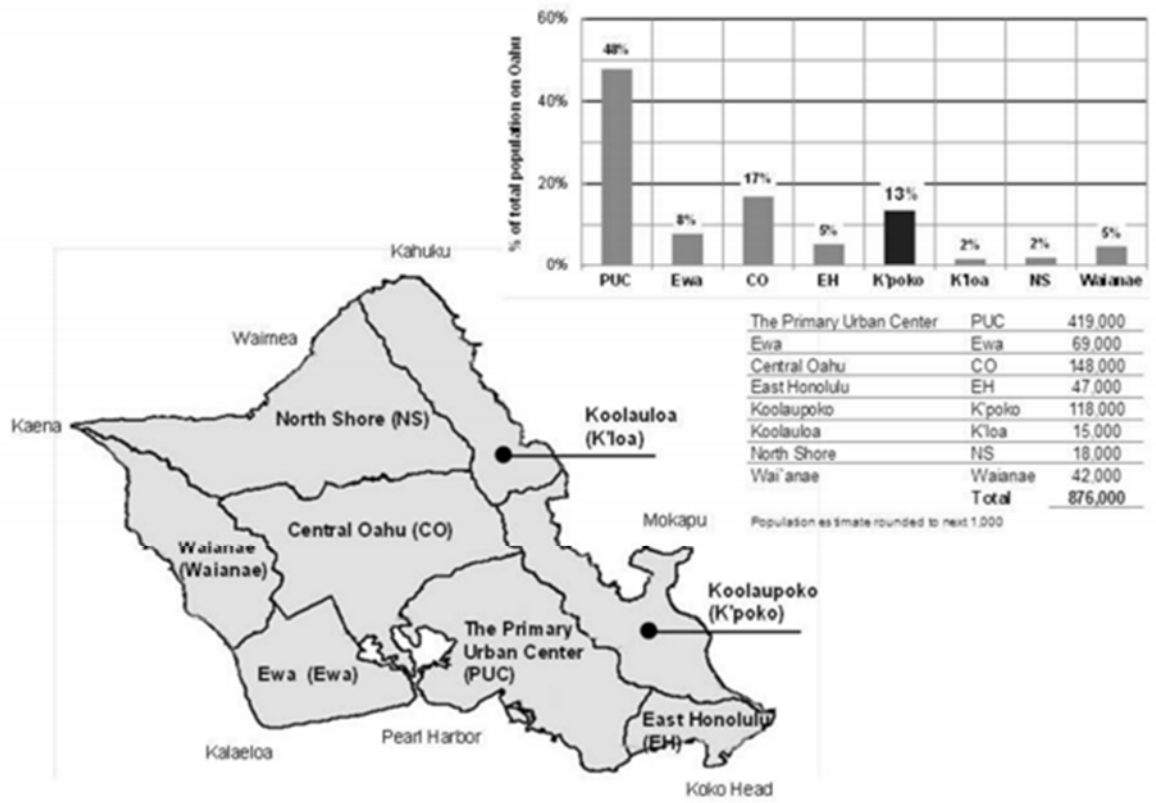
The 2011 FEIS reported that the Koolau Poko region had the third largest population among the seven main districts of the City & County of Honolulu. Figure 3.11.1.1 indicates the 2011 FEIS distribution of population on Oahu. As indicated, about 13.5 percent of the Oahu population lives in the Koolau Poko region. The 2011 FEIS described that the main population centers in the Koolau Poko region are the Kailua and Kaneohe subareas, which together account for approximately 70% of the population of the Koolau Poko region.

The 2011 FEIS described existing policies and future visions of the region to retain a constant population density in the Koolau Poko region and discourage significant population growth in the region. For the period from 1980 through 2000, the 2011 FEIS reported that the Koolau Poko region had experienced little growth. While the total population within the City & County of Honolulu was growing from 1990 to 2000, the population in the Koolau Poko regions had remained essentially constant.

The following is excerpted from the updated Koolau Poko Sustainable Communities Plan (2017):

The 2010 resident population in Ko'olau Poko was 115,164 persons, 2,835 persons fewer than the 2000 Census figure of 117,999 people. The region experienced an average annual population decline of approximately 0.2 percent, in contrast to an estimated island-wide annual population increase of 0.9 percent. Consequently, the region's share of Oahu's total population has declined from about 13 percent to about 12 percent. This declining trend is projected to continue through 2035.

Furthermore, given Ko'olau Poko's declining population, there has been only modest growth in the demand for commercial land uses to support the communities of this region. Nevertheless, the continued viability of existing commercial districts and institutions are an important part of the vision for Ko'olau Poko because they provide a significant number of jobs for residents within the region and play an integral part in the region's social and cultural life.



The Primary Urban Center	PUC	419,000
Ewa	Ewa	69,000
Central Oahu	CO	148,000
East Honolulu	EH	47,000
Koolaupoko	K'poko	118,000
Koolauloa	K'loa	15,000
North Shore	NS	18,000
Wai'anae	Waianae	42,000
	Total	876,000

Population estimate rounded to next 1,000

Figure 3.11.1.1: Population distribution in City & County of Honolulu (2000 estimate, source DPP) (source Figure 3-42 of the 2011 FEIS)

The 2011 FEIS reported that the urban areas of Kailua and Kaneohe were generally categorized as "bedroom" communities. The bulk of the population in these two regions commuted every day to employment centers in the central part of Oahu. The development of the labor force on Oahu showed that it has been growing at a faster rate than the population, suggesting that Oahu provides a favorable employment environment.

3.11.2 Police and Fire Department

Section 3.11.2 described the locations of police and fire department stations that would serve the project site. The locations have not changed since the 2011 FEIS.

<u>Fire stations:</u> There are three fire stations that serve the Kailua area and would also serve the proposed Kapa'a Light Industrial Park. These fire stations and the approximate distances to the proposed site are as follows:

(1) Main Kailua fire station on Kuulei Road, at a three-mile distance from the proposed site,
(2) Fire station on Kaneohe Bay Drive at the Aikahi Park Shopping Center, at a two-mile distance,
(3) Olomana fire station on Kalanianaole Hwy., at a two-mile distance.

Police Stations: The police station that would serve the proposed Kapa'a Light Industrial Park is located next to the Kailua main fire station on Kuulei Road, about three miles from the proposed site.

3.11.3 Medical Facilities

As describe in Section 3.11.3 of the 2011 FEIS there are two major medical facilities within five miles of the project site. The location and services offered by the two facilities have not changed since the 2011 FEIS. .

Castle Medical Center - 2.5-mile distance from proposed site 640 Ulukahiki Street, Kailua, HI

- Castle Medical Center is a non-profit medical facility owned by the Seventh-day Adventist Church and operated by Adventist Health. This 160-bed primary health care facility is located next to Kawainui Marsh on the Windward side of Oahu. The clinic serves the entire island of Oahu. The medical facility provides a wide range of inpatient and outpatient services. The clinic has a 24-hour emergency department.
- Hawaii State Hospital is located at a 5.0-mile distance from the project site, at 45-710 Ke'aahala Rd., Kaneohe, HI. The Hawaii State Hospital is a 202-bed hospital located in Kaneohe on the windward side of Oahu. The hospital provides integrated and evidence-based psychiatric treatment and rehabilitation to individuals suffering from mental illness and co-occurring disorders. It is the only hospital in Hawaii which is dedicated to serving adults with serious mental illnesses. It is slated for expansion in 2021 .

3.11.4 Recreational Facilities

Section 3.11.4 of the 2011 FEIS described that there was one community park within a one-mile distance from the proposed site, the Kawainui Model Airplane Park, which is still in operation and has not changed in operation and size.

The Kawainui Model Airplane Park is located on the Western perimeter of the Kawainui Marsh and directly adjacent to the Lower project site. The Kapa'a Quarry Road separates the "airplane" park from the proposed site of the Kapa'a Light Industrial Park.

The 2011 FEIS reported that there were plans of potential two future recreational venues, one park and one trail system, but these projects remain in the planning phase and no construction has been completed.

3.11.5 Schools

Section 3.11.5 of the 2011 FEIS described that there were several public and private schools within a two-mile distance from the proposed site. The locations and operations of these schools have not changed since the 2011 FEIS.

The closest public-school campus is the Kalaheo High School & Windward Community School, approximately one mile from the proposed site. This school is the only educational institution within walking distance to the proposed site. The Kapa'a Quarry Road does not serve any residential areas

between the proposed site and the school, and students would not normally walk past the proposed site.

Other schools that are within a two-mile distance from the proposed site are Le Jardin (a private School), Kailua High School, Maunawili Elementary School, Kailua Elementary School, Aikahi Elementary School and Kainalu Elementary School.

3.11.6 Refuse Collection and Disposal

As the 2011 FEIS described that was no municipal refuse collection at the project site. The conditions for the refuse collection and disposal have not changed.

Refuse was collected and disposed of by private waste management companies. The City and County of Honolulu solid waste transfer station is less than a quarter of a mile from the proposed development site.

3.12 Existing Supply and Demand for Industrial Space in the Region

Section 3.12 of the 2011 FEIS described a market study that was conducted to evaluate the existing supply of industrial space in the Koolau Poko region and the ability of the region to absorb the planned expansion of planned additional industrial warehouse space of approximately 600,000 square feet of. This area was planned to be added by the expansion of the Kapa'a Light Industrial Park.

As reported in the 2011 FEIS the market study suggested the following conclusions about the existing supply and demand of industrial space in the Koolau Poko region:

(1) A comparison of the four counties of the State of Hawaii indicated that the supply of industrial space in the state differs significantly between the islands. The City & County of Honolulu had a per capita allowance of industrial space, e.g., the available industrial space in each county divided by the county population, of 39.3 square feet per capita, which is slightly below the statewide average of 44.9 square feet per capita.

(2) The comparison of per capita allowances for industrial space in the major trade areas on Oahu, urban Honolulu, Ewa/Waianae, and Central Oahu with the Koolau Poko region suggested that the Koolau Poko region contains only approximately 21 percent of the industrial space demand created by the resident population. Therefore, the region was significantly undersupplied with industrial space.

(3) In another comparison between regions, while urban Honolulu had 54 percent of the population, it had 59 percent of the industrial space of Oahu. In contrast, the Koolau Poko region had 13 percent of Oahu's population but only 3 percent of the industrial space.

(4) Historically, most of the demand created by windward (including Koolau Poko region) areas had been oriented to other areas of the island, notable Honolulu, for industrial uses. While the lack of industrial space, notably those of intensive industrial uses and those that serve

island wide market, was in accordance with development plans for Koolau Poko, the region was also significantly undersupplied with industrial space that accommodated neighborhood/ local and sub-regional industrial types of services, such as neighborhood-oriented contractors, suppliers, repair shops, craftsmen/woodworking businesses.

(5) This lack of suitable space for local businesses in the Koolau Poko region resulted in increasing time and costs for serving the windward side of Oahu from locations elsewhere in the island. Furthermore, providing the needed services from locations outside the region resulted in escalating traffic.

(6) Due to the significant problems with commuting to urban Honolulu, for example, small business owners were looking to relocate their business operations closer to their residences, employees and/or tenants.

(7) At the time of the 2011 FEIS the Koolau Poko region contained about 992,000 square feet of finished floor space, which represented 3 percent of Oahu's total industrial space. The 2011 FEIS quoted the market study that the region can readily absorb approximately 832,000 square feet of industrial space in the planned duration of project full build-out. This addition of 832,000 to the then existing 992,000 square feet of finished floor space would have still only represented only about 40 percent of the average allowance for the region. In other words, even with the addition of 140 percent of the planned maximum capacity of the proposed Kapa'a Light Industrial Park, the Koolau Poko region would have remained significantly undersupplied with industrial space when compared with the island-wide Oahu supply of industrial space. It should be noted that the prediction of the region's ability to absorb the planned amount of space was based on providing industrial space and land businesses to businesses that would serve the local and sub-regional market and not the Oahu island-wide market.

(8) In addition, a significant amount of industrial space was lost in the region due to conversion of industrial zoned land to commercial and other uses, i.e., the rezoning of industrial lands in Kailua Town to more profitable mixed-uses. The adds to the long-term undersupply of industrial space in the Koolau Poko region.

(9) Excluding the proposed project site, the market study suggested that the amount of available industrial space/land that is extremely limited in Koolau Poko. There is truly little suitable land within Koolau Poko that offers the same favorable site conditions, including being centrally located within the Kailua and Kaneohe trade area, good access to the regional roadway, being located within the State "urban" land use district and therefore designated for urban development and the existing industrial uses within the Kapa'a Valley. Therefore, the proposed site is uniquely suited to the proposed use.

(10) The character of the businesses using future space in the region would not be intensive but limited industrial land uses. This was consistent with the long-term development plans for the region.

The projections and findings of the 2010 market study support the function of the Kapa'a Light Industrial park to provide present as well as future demands for industrial zone space in the Koolau Poko region. The findings under point (4) above suggest the significant demand for with industrial space that accommodated neighborhood/ local and sub-regional industrial types of services, such as neighborhood-oriented contractors, suppliers, repair shops, craftsmen/woodworking businesses. A tenant survey conducted at the site after the 2011 FEIS was approved indicated that many of the tenants at the project site have demands described under point (4) above.

A trend not mentioned in the 2010 market study, but observed in the past years, is that former industrial zoned or operated developments in the Koolau Poko regions have been transferred to different land uses, such as upscale residential developments. This trend, most likely to be continued in the future, would exacerbate the loss of industrial space, and therefore support the need for more industrial space in the Koolau Poko regions.

3.12.1 Future Supply and Demand for Industrial Space in the Region

Based on the updated Koolau Poko Sustainable Communities Plan (SCP) published in 2017, despite the declining population expected, continued viability of commercial activity is important.

"*Furthermore, given Koolau Poko's declining population, there has been only modest growth in the demand for commercial land uses to support the communities of this region. Nevertheless, the continued viability of existing commercial districts and institutions are an important part of the vision for Koʻolau Poko because they provide a significant number of jobs for residents within the region and play an integral part in the region's social and cultural life.*

Most of Koolau Poko's industrial land is within the Kapaʻa light industrial subdivision. The designated industrial land and building inventory is expected to be capable of meeting future demand, especially considering the declining island-wide demand for industrial space and no windward airport or harbor to generate or sustain high demand in the area. Industrial activities and future opportunities are likely to be limited to small service and repair operations, storage facilities, and other service business uses that are oriented to the needs of the region's suburban and rural communities.

The anticipated demand for industrial space in this region will be more light industrial uses and can be accommodated within the existing industrial or mixed-use zones of the town centers of Kailua and Kāneohe and in the vicinity of the Kapaʻa quarry." Section 3-46.

Therefore, the Koolau Poko SCP acknowledges the demand for light industrial uses in the vicinity of the Kapa'a quarry, and the KLIP fits the type of service and repair shops and storage facilities envisioned in that plan.

CHAPTER 4 - ENVIRONMENTAL IMPACTS AND MITIGATIONS

Chapter 4 of the 2011 FEIS described the various impact by the Proposed Action and impact mitigation measures that were proposed in the approved 2011 FEIS. As was described before in this 2021 Draft SEIS, there have been significant changes in the site development approaches since the 2011 FEIS was approved. This section therefore describes changes in the site development and evaluates changing impacts and the proposed impact mitigation measures.

The differences will be clarified between the SEIS Preferred Alternative and the SEIS No-action alternative. The SEIS Preferred Alternative includes the proposed changes in site development strategies and the impact mitigation measures proposed to Lower impacts to the environment and the community than those disclosed in the 2011 FEIS or other governmental permitting actions.

The SEIS "No-Action Alternative" does not show proposed changes in site development strategies and therefore does not include the proposed impact mitigation measures. As a result, the SEIS "No-Action Alternative" would cause impacts predicted to be more severe than those under the Preferred Alternative. The SEIS "No-Action Alternative" is not to be confused with a typical "no-Action" alternative that would eliminate any development on the project site.

The discussion in this Section will include current SEIS relevant alternatives, and not the two 2011 FEIS alternatives. However, where appropriate, direct references to impact mitigation comparisons between the current SEIS and the 2011 will be made.

4.1 Impact Mitigation though Low Impact Development for Lower Portion of the Site

2011 FEIS Commitments Still in Force

Section 4.1 of the 2011 FEIS describes a central premise by the Applicants that goes to the heart of the overall site development approach of the Kapa'a Light Industrial Park. This premise is the assertion by the Applicants will use sustainable and low impact development strategies for the development of the project site.

In the 2011 FEIS, the Applicants made a commitment to use green building strategies to develop the Lower portion off the project site which are consistent with the LEED Green building standards. The goal is to obtain LEED certification for the Lower site.

The proposed development in the Lower site will therefore be designed and constructed to conform to requirements under the Leadership in Energy and Environmental Design (LEED) green building certification system of the U.S. Green Building Council. The LEED green building certification program recognizes sustainable green building and development practices and awards levels of compliance to projects that implement strategies for better environmental and health performance.

Under the LEED certification a project must qualify, confirmed by a third-party audit, to achieve a certain number of points, in accordance with different levels of certification. The goal is to achieve a Silver certification of the Lower portion of the site.

In the time since the 2011 FEIS was approved. the LEED standard has gone through changes and the certification requirements have become more stringent.

The sustainable development plan for the Lower portion of the site, described in the 2011 FEIS, is still valid. The plan emphasized those LEED credit categories which would effectively mitigate impacts causing the largest concern for the project site. Consequently, the mitigation of water-related impacts was emphasized by attempting and surpassing the maximum LEED credit points for water efficiency. In addition, the Applicants decided to pursue all relevant Sustainable Sites category credits. Some credits were not readily achievable due to the location of the proposed site (not close to existing residential areas, high density developments or connected to public transportation), therefore these credit points were not attempted. Under the credit area Sustainable Sites, however, important mitigation of stormwater runoff and light pollution was implemented.

Table 4.1.1. shows the LEED credits that were selected in the 2011 FEIS for implementation to make recognizable steps for effective impact mitigations and describes any changes in the LEED credit strategy since that time. **All mitigation strategies planned to be attempted also are consistent with the 2017 Koolau Poko Sustainable Communities Plan**.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
LEED Credit Category - Sustainable sites		
	Alternative Transportation - Bicycle	2011 FEIS Lowering the amount of traffic on the roadways to the project and directly adjacent to the marsh by promoting the use of bicycles to commute. The present traffic situation on the quarry road is not conducive to bikers; the proposed marsh perimeter pathway would provide an excellent approach to combine bicycle friendly traffic condition with making the marsh more accessible regarding recreation and enjoyment of nature. Current SEIS This LEED credit will still be attempted. The realization of sizable pedestrian or bicycle traffic to the site would be greatly supported by the construction of a Kawainui Marsh perimeter trail.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
	Restore Habitat	2011 FEIS The areas around the development footprint are restored with native or adapted plants, and the present invasive vegetation will be removed. These areas will serve as vegetative buffer zones around the development site, thereby mitigating visual impact, noise impact and air pollution. Furthermore, the buffer zones will provide some habitat for wildlife and will serve as infiltration areas for stormwater and treated wastewater, thereby mitigating runoff, and providing for better onsite wastewater treatment. Current SEIS This LEED credit will still be attempted. The new site perimeter berms will have a dense vegetation cover primarily for visual impact mitigation, but also for noise and fugitive dust mitigation. The vegetation cover will provide habitat for wildlife and will serve as infiltration areas for storm water and possibly also for recycled wastewater if applicable.
	Maximize Open Space	2011 FEIS The areas within and at the perimeter of the development footprint will contain the maximum amount of open space which is achievable for the planned layout of the warehouse development. The open space will be vegetated and pervious; open space also includes open grid pavement, which contains some vegetation and has a perviousness of at least 50 percent. Current SEIS This LEED credit will still be attempted. The open space outside of the project site will remain open space.
	Stormwater Design - Quantity	2011 FEIS The installation of detention ponds will act as flood control and will mitigate high runoff volume that could cause erosion impacts on the stream beds and associated sedimentation in the receiving waters. The design of detention ponds will consider measures to avoid attracting endangered water birds

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		to the open water within the detention ponds, which could expose the birds to enhance predator threats. The use of stormwater recycling and rainwater harvesting will furthermore mitigate the frequency of runoff event that will fill the detention ponds. Current SEIS This LEED credit will still be attempted, and in fact the credit requirements will be exceeded. Underground storm water detention vaults will be used in lieu of extended detention ponds, since ponds with free water surface must not be used to avoid attraction of water birds to the project site. Attraction of water birds to the project site could enhance predator risks and traffic-related risks for the birds.
	Stormwater Design – Quality	2011 FEIS The stormwater runoff will be treated at an enhanced standard by using a comprehensive treatment approach that will contain stormwater filter units and one extended detention pond. The filter units are located upstream of the detention pond and serve as settlement tanks that remove all floatable debris, sediments and oil and grease from the runoff. The extended detention ponds have a design residence time of 24 to 48 hours and provide treatment capacities to further remove sediments, nutrients, and suspended solids. The combined pollutant removal rate of the filter units and detention ponds is estimated of well over 80 percent, which is the required threshold for this LEED credit. With implementing this comprehensive stormwater treatment system impacts from stormwater runoff to the receiving waters, e.g., the Kapa'a Stream, the adjacent wetland area, the Kawainui marsh and the drainage canal along the quarry road can be effectively mitigated. Current SEIS This LEED credit will still be attempted, and in fact the credit requirements will be exceeded. An advanced stormwater treatment system will be installed that will include low impact (LID) technologies as well as manufactured treatment devices

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		(MTDs). The proposed storm water BMPs under the 2011 FEIS will be replaced by storm water BMPs which are more effective in treating the storm water runoff.
	Heat Island Effect – Non-roof	2011 FEIS The use of pavement with high Solar Reflectance Index (SRI) material, the planting of trees and the use of open grid pavement decreases the heat island effect within the development, therefore improving the thermal performance of the buildings. The use of trees inside the development will also mitigate visual impacts. Current SEIS This LEED credit will still be attempted. The updated site design has changed to remove landscaped areas inside the site from the site development plans. Therefore, trees will not be planted throughout the interior of the site, but only at the building walls in relatively narrow plant beds. The use of high Solar Reflectance Index (SRI) pavement will still be used to Lower heat island effects.
	Light Pollution Reduction	2011 FEIS Light pollution, or excessive lighting that can impact wildlife in the adjacent wetlands, diminishes night sky enjoyment and produces glare, which could be detrimental to motorists passing the development. Implementing effective reduction of exterior and interior lighting are effective measures to mitigate this impact. Current SEIS This LEED credit will still be attempted. Reducing light pollution for the new site development has been described in a Light Pollution Reduction Plan that was approved by the accepting agency.
Credit category WE - Water Efficiency		
	Water Use Reduction	2011 FEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		The reduction of water use by at least 30 % reduces the impact on the municipal infrastructure and reduces the amount of wastewater that needs to be treated onsite. The mitigation of all water related impacts resulting from the proposed development are a high priority for the proposed project. Current SEIS This LEED credit will still be attempted. Reducing potable water consumption is an important site development strategy. The water reduction strategies will include selected water conserving fixtures. In the time since 2011 FEIS, significant water conserving technology has become widely available and is now a recognized building approach.
	Water Efficient Landscaping	2011 FEIS Avoiding potable water for irrigation reduces the impact on the resources of the municipal water supply and reduces impacts of runoff, since stormwater can evaporate from plants and infiltrate into the ground rather than be discharged directly into the receiving waters. The use of native and adaptive plants within the development and in the buffer, zones surrounding the developments reduces the demand for irrigation water, but also reduces the requirements for fertilizers and pesticides. Current SEIS This LEED credit will still be attempted. Storm water will be harvested and use to irrigate the vegetated site perimeter berms, the vegetated buffer strips (a LID technology) and planters adjacent to buildings. The proposed irrigation system will significantly reduce potable water use for irrigation.
	Innovative Wastewater Technologies	2011 FEIS The use of advanced onsite wastewater treatment effectively reduces the emissions of biological oxygen demand (BOD), total suspended solids, nutrients, metals, and harmful bacteria in the effluent of the development. The advanced

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		treatment furthermore makes it possible to use the treated wastewater for below ground irrigation, furthering the treatment of the wastewater, and producing a sewage effluent that will surpass the typically achievable pollution removal rates in domestic and commercial sewages effluent. The removal of high amounts of pollutants from the effluent of the development is effectively reducing impacts on the receiving waters and is protecting the adjacent wetlands. Current SEIS This LEED credit will still be attempted, and in fact significantly exceeded. The selected wastewater technology currently implemented at the site significantly surpasses conventional wastewater treatment technology. The selected wastewater treatment technology is based on Membrane Bioreactor (MBR) processes. The selected MBR process has been certified under the NSF 350 standard, which endorses the onsite wastewater technologies to use the treated effluent for irrigation and other external applications.
Credit category - Energy & Atmosphere		
	Optimize Energy Performance	2011 FEIS The planned significant reduction of energy consumption, at least 30 percent, and power demand in the proposed development will mitigate impacts on the energy supply of the state. By providing modern, environmentally friendly and energy efficient warehouses to replace older inefficient industrial buildings has an important benefit for the environment and for Hawaii's residents. At the present, Hawaii obtains about 80 percent of its electricity from imported oil, making it one of the most oil dependent locations in the developed world. Saving electricity equates to saving importing oil which mitigates impact on the environment and the economy.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		Current SEIS This LEED credit will still be attempted. Reducing energy consumption is an important green building applications for the project site.
	On-Site Renewable Energy	2011 FEIS Implementing renewable energies to power the proposed development reduces the energy consumption and reduces the peak power demand. By reducing the power demand, the public utilities are less burdened by the new development and thus less new infrastructure must be built and maintained, thereby directly reducing impacts on the environment and the community. Current SEIS This LEED credit will still be attempted. The Applicants have already installed a significant capacity of photo-voltaic system on the roof of warehouses. If permits allow, the Applicant plan to install significantly more PV capacity at the project site in the future.
	Measurement & Verification	2011 FEIS Verification that the ambitious energy and power reduction plans are met by the tenants is important to continuously assure that the environmentally friendly and energy efficient design goals are met during operation of the proposed industrial park. Current SEIS This LEED credit will still be attempted. Some of the applicable requirements an already spelled out in the new Honolulu Energy Code.
Credit category - Materials & Resources		
	Storage and Collection of Recyclables	2011 FEIS The handling of waste will be an important aspect of environmentally friendly operation of the proposed industrial park. Well planned and maintained waste management and

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		recycling programs will increase the awareness of the occupants to engage in responsible handling of waste and avoid littering, thus mitigating the possibility that waste can pollute the adjacent wetland and other environmentally important areas. Current SEIS This LEED credit will still be attempted. Since the project site has no municipal waste collection, refuse is collected and disposed of by contractors.
	Construction Waste Management	2011 FEIS Construction waste management will reduce the amount of waste that has to be transported to landfills. Traffic impacts are reduced by Lowering the amount of construction related heavy truck traffic and impacts on the community are reduced by avoiding dumping into municipal landfills. Current SEIS This LEED credit will no longer be attempted.
	Recycled Content	2011 FEIS Recycled and reused content reduces the impacts on the community and the transportation energy demand on the islands. Current SEIS This LEED credit will still be attempted. Collecting recyclables at the project site has been going on for several years. These efforts will be continued in the future.
	Regional Materials	2011 FEIS The use of regional material reduces the need to import materials to the state and supports the community by supporting local businesses. Current SEIS This LEED credit will still be attempted to the extent possible.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
Credit Category - Indoor Environmental Quality The warehouses will be constructed in a "core-and-shell" manner, meaning only common areas will be constructed by the Applicants and the tenants will be responsible for their interior build-out. Therefore, IEQ related impact mitigation strategies will only apply to the common areas.		
	Construction IAQ Management Plan - During Construction	2011 FEIS By using strict rules about construction material handling and the use of low emitting materials impacts on the indoor and outdoor environment can be Lowered. Current SEIS This LEED credit will not be attempted because the warehouses are constructed in a "Core and Shell" manner.
	Low-Emitting Materials	2011 FEIS By using only adhesives & sealants as well as paints & coatings with low concentration of harmful components, a good indoor and outdoor environment is maintained. In addition, there will be active encouragement to the occupants to use only environmentally friendly adhesives, sealants, paints, or cleaning agents helps to mitigate further impacts to the environment during operation of the proposed industrial park. Current SEIS This LEED credit will still be attempted. Reducing material that emits harmful air pollutants is an important measure to protect tenants.
	Daylight & Views	2011 FEIS The use of daylighting will reduce the electricity demand and related impacts on public infrastructure. By implementing the extensive use of daylighting, the building design needs to address mitigating measures for light pollution from internal lighting that might arise when building openings (e.g., those used for daylighting) can transmit light at night and thus contribute to light pollution. Current SEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		This LEED credit will still be attempted. Providing daylight through skylights has been used for previous warehouses at the site.
Credit category - Bonus credits from Innovation & Design, Exemplary Performance and Regional Priorities		
	Educational Program	2011 FEIS The applicant will develop and implement an educational program about the environmentally and culturally important Kawainui Marsh. The program will endeavor cooperation with schools and environmental groups to develop, produce and maintained the educational program. This effort will increase community involvement and will assist to identify and mitigate concerns of the community. Current SEIS This LEED credit will still be attempted. The initial idea was to erect some form of educational kiosk adjacent to the project site that describes how industrial developments which adopt green building measures can coexist with environmentally sensitive areas. The updated approach would be to support community-planned educational facilities at the marsh perimeter.
	Electric Vehicles for Maintenance Vehicles	2011 FEIS The use of electric vehicles for maintenance of the proposed park helps to Lower noise and air pollution. The use of renewable energy for the maintenance vehicles (either through onsite renewable energy generation or through tradable renewable energy certificates) will reduce impacts on the environment and the community. Current SEIS This LEED credit will still be attempted if <u>there is sufficient photovoltaic capacity available.</u>
	Legally Binding Performance Criteria for Tenants	2011 FEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		Making provisions of the sustainable development approach contractually binding, rather than voluntary, will help to achieve the goals for an environmentally friendly and energy efficient industrial park. Current SEIS This LEED credit will not be attempted
	Exemplary Performance for Stormwater System	2011 FEIS The project will implement a comprehensive stormwater treatment system that goes beyond conventional stormwater treatment technologies. In doing so, the project will qualify for exemplary performance credits. By using advanced stormwater treatment to treat 100 percent of the stormwater runoff, environmental impacts associated with runoff will be effectively and greatly mitigated, thus significantly reducing impacts on important water resources adjacent to the project, including the Kawainui Marsh. Current SEIS This LEED credit will still be attempted. The storm water treatment and management approach for the Lower site significantly exceeds credit requirement.
	Exemplary Performance in innovative wastewater technologies	2011 FEIS Adding advanced sewage treatment process steps to the conventional septic systems (such as aerobic biological treatment, denitrification by conversion of nitrates to atmospheric nitrogen, phosphate removal through absorption in the filter bed, sand filters and below ground irrigation fields), results in high removal rates of harmful pollutants in the wastewater effluent. The effective removal of a high portion of harmful pollutants significantly reduces environmental impacts. Current SEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		This LEED credit will still be attempted. The wastewater treatment and management approach for the Lower site significantly exceeds credit requirement.
	Regional Priorities	2011 FEIS By implementing design and construction measures and technologies that are deemed important for the region, the project contributes to Lowering impacts to the environment and the community. Current SEIS This LEED credit will still be attempted. Storm water and wastewater treatment and management is of high regional importance.

4.2 Geology, Topography, and Soils Existing Environment

Section 4.3 of the 2011 FEIS describes impacts on geology, topography, and soil at the project site.

4.2.1 Impacts on Geology and Mitigation

The SEIS Preferred Alternative and SEIS "No-Action Alternative" would be developed within previously disturbed soil areas and thus the project would not impact local geology.

No mitigation measures would be required under both actions, e.g., the SEIS Preferred Alternative and SEIS "No-action Alternative".

4.2.2 Impacts on Topography and Mitigation

The present topography within the proposed project areas is generally flat, as a result of past landfill operations, which created two distinct topographic features. The Upper portion of the site is practically flat, with an average elevation of 85 feet and a maximum height difference of 10 feet between the western and eastern boundaries of the Upper portion of the site. The height difference of 10 feet occurs at one location where a 5 to 8 feet high berm separates the "older" from the "newer" Upper site

The Lower portion of the site has a slight elevation gradient towards the North-east. The elevations at the opposite site perimeter are about 45 feet.

SEIS Preferred Alternative – implementation would result in negligible alterations of existing topography in the Upper portion of the site and significant alterations for the Lower site. All the land in the Upper

portion of the site has been previously graded and has a topography that is suitable for the planned development. Under the SEIS preferred Alternative, the full build-out finish grade elevation in the Lower site would increase by an average 12 feet.

SEIS No-Action Alternative – Implementation would likewise result in negligible alterations of existing topography in the Upper portion of the site and significant alterations for the Lower site. Under the SEIS No-Action Alternative, the full build-out finish grade elevation in the Lower site would increase by an average 5 feet. Under both alternatives, the topography of the sloped areas between the Upper and Lower portions of the site would not be altered, except for some grading to accommodate the landscaped areas and some minor structures or infiltration fields for the treated wastewater.

Expected impacts due to the presence of the added fill and increased full build-out site perimeter berms would be somewhat higher for the SEIS Preferred Alternative than for the SEIS No-Action Alternative. This is since more erosion of un-stabilized slopes can be expected with higher berms. Higher impacts from fugitive dusts and soil transported to and distributed on the site can also be expected for the SEIS Preferred Alternative because of the higher finish grade elevation and the larger volume of fill that must be brought to the project site and distributed during grading. The latter would impose higher traffic impacts during construction.

The elevated finish grade would pose visual impacts of the perimeter berms which would be similar under both alternatives but would be more pronounced under the SEIS Preferred Alternative, because of the higher perimeter berm elevations.

Mitigation efforts to curb fugitive dust would have to be more effective and would have a wider scope for the SEIS Preferred Alternative. Likewise, impact mitigation during construction would have to be more effective and more applied under the SEIS Preferred Alternative. Visual impact mitigation would be similar for both SEIS Alternatives with planting a dense vegetative cover on the perimeter berms, with large trees on or near the crown of the perimeter berms.

Important Differentiator- The SEIS Preferred Alternative has one important differentiator compared to the SEIS No-Action Alternative - the elevation of the full build-out finish grade in the SEIS Preferred Alternative is the height that is required for the proposed storm water treatment and management system. **Therefore, the elevated finish grade of the SEIS Preferred Alternative is an important enabler for effective storm water impact mitigation.**

4.2.3 Impacts on Soils and Mitigation

This section evaluates potential effects of the SEIS Preferred Alternative and the SEIS No-Action Alternative on soil resources at the proposed site and the potential for soil characteristics to affect proposed uses.

Both alternatives would directly affect soils because of construction/demolition activities (i.e., grading, excavation, placement of fill, compaction, mixing, and augmentation) on approximately 10 and 19 acres in the Upper and Lower portion of the site, respectively. Of the estimated 29 acres (combined), all construction would occur on currently graded and pervious land.

All land that is being used for the development of the proposed industrial park is presently graded and no open space, outside the land created by former landfills, will be used for the development.

The presently graded surfaces used for the development are not vegetated and are either practically flat or have small slopes, therefore impacts from erosion and associated sedimentation would be limited.

SEIS Preferred Alternative - land inside the site perimeter both the Upper and Lower portions of the site would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings) Soil productivity, (i.e., the capacity of the soil to produce vegetative biomass), would be eliminated in disturbed areas that are converted to impervious surfaces.

SEIS No-Action- about 10 acres of land in the Upper portion of the project site would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings). In the Lower site about 19 acres would become impervious land and the remaining 6 acres of land inside the site perimeter would be landscaped and therefore pervious land.

Under both alternatives:

- As part of the sustainable development approach, rainwater and stormwater runoff would be collected from selected rooftops and be used for irrigation, thus converting these impervious surfaces to quasi pervious areas.
  For the SEIS Preferred Alternative, about 35 %of the total 373,000 sqft roof tops within the Lower portion of the site would be used for rainwater harvesting, thus about 3.0 acres would be converted to quasi pervious area.
  For the SEIS No-Action alternative, a similar amount of roof top area would be used for rainwater harvesting.
- Heavy machinery would be used to prepare the site for construction of the proposed buildings and facilities and for digging trenches for utility lines. As a result, soils would be compacted, the soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion. Potential building limitations for soils at the proposed project site might include limitations to the load-supporting capacity of soil within the Lower portion of the site and the ease and amount of excavation required for the proposed construction. The soil layers found within the landfill area of the Lower portion of the site might contain municipal waste from previous landfill operations.
- Soil engineering studies would be conducted prior to grading in the Lower portion of the site. This assures good soil foundations for the construction of structures. Prior to construction, a sediment and erosion control plan will be developed for the proposed development, in accordance with the governing local ordinances and the requirements of the sustainable development approach (which goes beyond the measures required by local code).
- The development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) was required to obtain NPDES permits for the release of construction related strong water. Several of these SWPPP have already been developed and submitted in conjunction of NPDES Notice of

Intent applications for construction related release of storm water, both for the Upper and the Lower portions of the site.

The sediment and erosion control plans and SWPPP define, among other things, appropriate site-specific Best Management Practices (BMPs) for controlling runoff, erosion, and sedimentation during construction activities. Site-specific BMPs are typically developed based on proper run-off calculations, slope factors, soil type, topography, construction activities involved, and proximity to water bodies. BMPs could include but are not limited to protective devices preventing surface drainage flows, erosion control matting, riprap, and sediment traps.

The application of any or all these BMPs, or other appropriate BMPs, would depend upon precise, specific ground conditions in the areas disturbed by construction. Areas disturbed inside the site would be stabilized with permanent pavement. Areas at the site perimeter, specifically the earth berms, will be planted preferably with native or adaptive vegetation following construction activities. This will decrease the overall erosion potential of the site and improve soil productivity. With soil erosion and sediment control measures, the actions proposed under this alternative would likely result in minor adverse impacts to soils from construction occurring in open areas.

Two soil investigations were conducted for the lower portion of the project in conjunction with site development planning. One investigation was concluded in 2012, and the other more recently in 2019. The following is a summary of the main findings and recommendations:

Site Preparation

- The site should be stripped of all vegetation, tree roots, and organically contaminated soils.
- Debris, rubbish, large organics, and other deleterious materials revealed in stripping work should be segregated and disposed.
- Trees, brush, roots, and organic-laden muck should be removed as much as feasible from existing marshy areas to receive fill, but excessively deep excavations should be avoided.
- The excavated soils can be used as fill on other areas of the site that are adequately prepared.
- Filled should compacted with appropriate heavy equipment.
- Water should be available onsite for dust control and keeping the exposed soils in a moist condition for effective compaction.

Excavations

- Some excavations might encounter large boulders, large chunks of concrete, and other unknown oversized materials that will require special efforts.
- Permanent cut slopes should be constructed no steeper than 2.0H:1V in stiff to dense soils.
- Slopes can be cut as steep as 1.5H:1V if stabilized with geogrid reinforcement.
- All cut and fill slopes should be provided with erosion protection and a complete cover of heavy vegetation as soon as possible after being constructed.
- Rows of deep-rooted vegetation such as vetiver grass can be considered to supplement the other fast-growing vegetation on the slopes. All slopes must be entirely covered with a healthy growth of protective vegetation.
- Slope benches should be provided in accordance with the grading code.

Fill

- All engineered fill should be free of deleterious materials, toxic or hazardous substances.
- Rocks greater than 6 inches in dimension should be deeper than 3 feet below finished mass graded elevations.
- Care must be given for the construction of the site perimeter berms.
- There is relatively soft to medium stiff imported clayey soils and rubbish underlain by deep, thick deposits of soft, saturated, organic laden silty to clayey marsh soils with a shallow groundwater table.
- It is stated that the impacts of seismic activity on the site are unpredictable. Generally, impacts might be more pronounced site locations where fill thicknesses are thinner and the soft, saturated marsh soils are closest to the surface.

Storm water Runoff

- It is especially important to keep water from ponding at the tops of slopes or infiltrating into slopes, which could significantly reduce their stability.
- Runoff must also be prevented from accelerating to a high rate wherever possible. The faster water is allowed to flow, the greater the erosion risk.
- Future construction must be designed to mitigate the impact of runoff on the graded site.
- Prevention of runoff onto the perimeter slopes is especially important.
- The clayey soils found at the site to have slow to very slow permeability.

Other considerations

- The perimeter berms could remain prone to creep and sliding, and require good completion of mass grading.
- It is estimated that the settlement (compression) of the underlying NATURAL soils is more than 90 percent complete under the current site condition. Therefore, ground settlement due to compression of the underlying NATURAL soil under the current condition should be minimal.
- The amount and rate of settlement of the existing FILL material is difficult to estimate and will vary according to the thickness of the FILL at a particular location, and the decomposition rate of the organics within the FILL.
- Support for new structures, pavement areas and other infrastructure will require special design and construction detailing to minimize the possible adverse effects from settlement (see the Support for Building and Infrastructure section below).
- Placement of additional fill over the site will result in additional ground settlement. It is estimated that the settlement will be on the order of 3 to 5 inches per 5-feet of fill.
- Except for the perimeter areas, the site topography is generally flat to gently sloping.

4.2.4 Special Considerations of Developing on the Former Landfill of the Project Site

Section 4.2.4 of the 2011 FEIS described considerations of construction on former landfills. The project site is a former landfill area. Based on information reviewed after the 2011 FEIS, the Lower and Upper portions of the site differ in the soil composition and their ability to support buildings. This affects the type of construction that has been used in the Upper site and will be used in the Lower site.

The considerations discussed hereafter apply for **both** the SEIS Preferred Alternative and the SEIS No-Action Alternative. Environmental impacts are similar between the two alternatives and impact mitigation measures are also similar and do not have to be differentiated.

The Upper site contains mostly inert fill that originated from quarry tailings and overburden. Soil exploration conducted after the 2011 FEIs was approved revealed that there is a high portion of clay below a 2-foot top layer of gravel. Based on soil studies, the soil can be assumed as fully consolidated.

In the Lower portion of the project site, soil studies have revealed quantities of municipal solid waste (MSW), including organic material, in the landfill body. It was reported in soil studies that the land fill body can be assumed to be nearly consolidated, with some more settling being expected once weight is added to the land fill.

Redevelopment of landfill areas that consist mostly of inert material, such as the Upper site, represents the easiest type of landfill to redevelop, as environmental problems are usually minimal and conventional geotechnical ground improvement techniques can be used.

Landfills that contain MSW, such as the Lower site, are the most common forms of landfill and redevelopment of this type of landfill needs to consider more engineering and environmental aspects, including special requirements for foundations due to differential settlement, and decomposition of organics which result in gaseous and liquid agents that leave the landfill, and therefore need to be mitigated with appropriate measures.

Redevelopment of landfills, both for inert and MSW, can utilize a wide range of established building and development technologies, depending on the type of land uses, such as soft (i.e., landscaping, parks, etc.) and hard uses (i.e., buildings, infrastructure), or the amount of gas and leachate generated in the landfill, among other design considerations.

The right foundation technology is dependent on the vertical and lateral load bearing capacity of the land fill material and whether landfill gas might migrate out of the landfill body. As a rule of thumb, redevelopment of closed landfills for hard use, such as that intended for the proposed project, should not start within 10 years of the closure of the land fill operations.

For the proposed project, landfill operation was discontinued more than 40 years ago, and therefore the landfill should have reached a degree of stability that is necessary to substantially mitigate the engineering and health and safety concerns associated with waste degradation. In general, there are two types of foundations used in landfill redevelopment: deep and shallow foundations. The proposed warehouses are relatively light structures that could use shallow foundations, such as raft foundations. If found to be necessary, some form of deep foundation might be considered for selected buildings,

though deep foundations using piles are not anticipated to be extensively used for the proposed site, if at all.

The soil bearing capacity in the Upper portion of the site has been investigated, and the experience with the existing buildings at the site indicates that normal foundations can be used on the structurally stable land. In contrast to the Upper portion of the site, where substantial structures have been built and show adequate foundation support, there are no existing large structures within the Lower portion of the site. The soil bearing capacity within the Lower portion of the proposed site and the most suitable type of foundation will be determined before construction of the structures begins.

The most appropriate foundation approach will be determined for the planned traffic areas and warehouse buildings. In addition to selecting an appropriate foundation approach for building structures, an appropriate load bearing approach must also be applied for the paved traffic areas to avoid possible problems arising from differential settling. Even if differential settling might occur, tested and state-of-the-art construction and building methods are available to manage unfavorable site conditions. These conditions are not expected given the experiences with the existing use and structures within the Upper portion of the site.

It should be noted that the intended use of the proposed site will be warehouse structures. The site development plan does not include any high-rise buildings or process facilities, which would require advanced load bearing capability, such as deep foundations with longer piles.

The intended structures for the proposed site will use conventional foundations, such as slab on- grade foundation. The present use of the site has indicated that the sub-grade represents a stabilized body that is deemed suitable for the intended type of structures.

It should be noted that construction on landfills typically requires more effort in design, construction and operation, and that redevelopment of landfills is more costly that developing regular construction sites. The benefit to the community is that redeveloped landfill area can free more valuable land for other developments in the community, and potentially reduce urban sprawl and related ecological stress to the environment.

4.3 Impacts on Water Resources

Section 4.3 of the 2011 FEIS discussed impacts and impact mitigation related to water resources for the alternatives presented in the 2011 FEIS. This SEIS section 4.3 describes impacts and impact mitigation for the SEIS preferred Alternative and the SEIS No-Action Alternative.

Assessing impacts on water resources adjacent to the project site and developing effective impact mitigation is of high importance for the site development approach because of the proximity of the project site to Kawainui Marsh and other wetland areas.

The fundamental differences between the SEIS Preferred Alternative and the SEIS No-Action Alternative in conjunction with water resources impacts is that the SEIS Preferred Alternative would implement advanced storm water and wastewater technologies while the No-Action Alternative would not.

Under the SEIS No-Action Alternative, storm water treatment and management strategies would be applied that reflect strategies that were presented in the 2011 FEIS, or strategies that would implement basic strategies that were compliant with governmental requirements, without pursuing site development strategies that are capable of more advanced impact mitigation.

The 2011 FEIS described basic storm water treatment and management concept designs that were not based on detailed design assessments to ascertain benefits and challenges of these design concepts. In the time since the 2011 FEIS was approved, more detailed engineering assessments have been performed.

These engineering assessments concluded that the storm water impact mitigation proposed in the SEIS Preferred Alternative would be the most viable options for the Lower portion of the site. This is because the discharge of storm water runoff requires a significant hydraulic head, or hydraulic energy, to drive the flow of the storm water runoff, to initiate and sustain the flow of storm water runoff through the treatment process. Therefore, the SEIS No-Action Alternative would not be considered for the storm water management system in the Lower portion.

The storm water treatment and management in the Upper site has minor differences between the SEIS Preferred Alternative and the SEIS No-Action Alternative. The only difference is that the SEIS Preferred Alternative would use vegetated buffer strips for three new buildings.

The onsite wastewater treatment technology used at the project site differs significantly between the SEIS Preferred Alternative and the SEIS No-Action Alternative. Under the SEIS Preferred Alternative, advanced onsite wastewater treatment would be used. Under the SEIS No-Action Alternative, conventional septic systems would be used. The significant difference between these two wastewater technologies is the degree of impact, which is significantly smaller with the waste wastewater treatment under the SEIS Preferred Alternative.

The following sections describe the potential effects of the alternatives on water resources at and surrounding the proposed site. Such water resources include surface and ground waters and consider impacts of the proposed project on the Kapa'a watershed, floodplains, and wetlands. Possible impacts by the drainage system, construction activities and leaching of the landfill are also considered.

4.3.1 Impacts on Surface Water and Mitigation

Section 4.3.1. of the 2011 FEIS described impacts of the Proposed Action under the 2011 FEIS on surface water resources both on and downstream of the project site. Storm water runoff is a leading cause of water quality impairment to receiving waters. Storm water management reduces or eliminates negative impacts of storm water runoff.

This section 4.3.1 describes effects of the two SEIS alternatives on surface water. Effects described hereafter include increased impervious surfaces and stormwater flows and their potential effects on surface water quality. The type of storm water impacts causes by the development of the project site is similar for the two SEIS alternatives. The type and effectiveness of impact mitigation is different between the two alternatives.

Storm water related impacts from new developments are distinguished between the construction related impacts and impacts during regular operation.

During construction, soils would be exposed, which could create increased potential for erosion and/or transport of surface pollutants into adjacent water bodies. A sediment and erosion control plan, or storm water pollution prevention plan, would be developed, as part of the permit requirements, to reduce surface erosion and control runoff of pollutants, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter the downstream receiving waters. Site conditions typically determine the most suitable and effective Best Management Practices (BMPs) to reduce potential impacts to adjacent land and waters. These construction related BMPs typically would include the following measures:

- Erosion containment such as silt fencing and sediment traps to avoid runoff of sediment from the site.
- Utilizing sedimentation basins to allow for settling of sediments from stormwater volumes,
- Covering disturbed soil or soil stockpiles with suitable cover material, i.e. , plastic sheet, place hay, grass, woodchips, straw, or gravel on the soil surface to cover and hold soils Scheduling the construction progress and applying the BMPs so that soil exposure remains minimal.
- Regular inspection of the erosion and sediment control BMPs and especially after each rainfall.
- Preventive measures to avoid exposure of hazardous materials, i.e., fuel or chemicals used in the construction and contain all rainwater that has been in contact with such material.
- Using a stabilized entry/exist to the construction site use stabilization gravel to avoid soil and dirt to be carried onto public roadways.
- One especially effective BMP for construction storm water pollution prevention for the construction in the Lower project site will be the construction of the earth berms before the grading of the Lower portion of the site commences. The berms are configured to be about 2 feet higher than the full build-out interior site finish grade. Therefore, the berms crowns will serve as effective containment in addition to the other containment measures.
- The planned BMPs and other measures of the sediment and erosion control plan, which will be implemented during construction, would effectively mitigate impacts to the water quality of the receiving waters surrounding the site. If impacts would occur from construction activities, these are expected to be minor and of short duration, occurring primarily during storm events.

Post-construction storm water pollution prevention measures, or BMPs must be installed and maintained during the lifetime of the project. These BMPs include structural and non-structural BMPs.

Structural BMPs are defined as stationary and permanent BMPs which are designed, constructed, and maintained to prevent or reduce the discharge of pollutants in storm water runoff. Since the project site is a former land fill where infiltration of precipitation contributed to the formation of landfill leachate, infiltration at the project site must be avoided, thus pervious cover must be avoided or minimized.

Non-structural BMPs focus on preserving open space, protecting natural systems and incorporate source control measures. One typical non-structural BMP is the reduction of impervious cover to promote infiltration of rainwater and thus retaining the storm water within the site.

The SEIS Preferred Alternative would have the following BMPS:

Structural BMPs:

- Drain inlets with debris screens to hold back larger floatable items.
- Vegetated buffer strips, to remove nutrients, sediments, and suspended solids, as potentially some heavy metals, through the filtering effects of vegetation, typically grasses.
- Rooftop runoff capture and reuse, for irrigation of the vegetated buffer zones, the vegetated buffer strips, and smaller plant beds inside the site.
- Water quality filters which are run-through treatment units for the water quality relevant flow, which for the project site is the controlled release of the dry detention vaults.
- Dry detention vaults below ground to temporarily detain run off and subsequently release the detained water controlled over a time between 25 - 36 hours. Controlled release of detained water shaves off high peak flow rates and mitigates potential stream bed erosion.
- Infiltration basin, the existing and vegetated infiltration and detention basin to the West of the Upper site boundary will be used to accommodate runoff from about 5 acres of the Upper site.
- Armored outfalls to the receiving water avoid soil erosion - the Upper project site has sloped site perimeters where the armored outfall avoids soil erosion of the slopes. In the Lower site, several armored outfalls avoid soil erosion of the vegetated areas in the Kapa'a Stream corridor. Although the vegetated area in the Kapa'a Stream corridor at the points of discharge of the outfalls is relatively flat, a riprap soil cover will dissipate flow energy and distribute the discharged water to a larger area, rhus mitigating soil erosion and associate impacts.
- Landscape restoration of the site perimeter zones.

Nonstructural BMPs:

- Protect riparian areas and natural flow pathway through effective pollution prevention. Protection of the adjacent wetlands and the Kapa'a Stream would be protected against runoff pollution and stream bed erosion.
- Revegetate the site perimeter zone as restored habitat.
- Rooftops disconnect - about 35% of the roof tops in the Lower site are collecting rainwater and harvesting it for irrigation and potentially other custodial applications.
- Source control - several No Exposure Certifications for Exclusion from NPDES Stormwater Permitting have been obtained for the existing warehouses and new No Exposure Certifications will be obtained for all new warehouse buildings. The No Exposure certifications (renewed every five years) require specific storm water pollution prevention measures which significantly improve source control.

Note that the SEIS No-Action Alternative could only implement the before mentioned structural BMPs in the Upper portion of the site, except for the vegetated buffer strips. The previous storm water treatment and management strategy for the Lower site, which was endorsed by the Accepting agency, suggested a combination of vegetated swale and infiltration vaults upstream of the perimeter berms at the Eastern site boundary. The infiltration would be located below the vegetated swales and receive treated runoff for temporary detention and subsequent infiltration. Infiltration from the underground

pervious detention vaults would have initiated sub surface water migration under the new earth berm at the Eastern site perimeter and towards the drainage ditch along the Kapa'a Quarry Road. The overflow of the vegetated swales and therefore the detention vaults would have been conveyed through drainpipes and discharged into the drainage ditch.

A soil engineering report commissioned by the Applicant in conjunction with a mass grading permit for the Lower site ruled that infiltration of significant water upstream and adjacent to the perimeter berms should not occur to avoid berm instability. (Refer to geotechnical recommendations restated Section 4.2.3). Furthermore, observation of the current conditions of the existing drainage ditch along the Kapa'a Quarry Road have revealed that the drainage capacity of the ditch is severely impaired due to soil filling the ditch and dense vegetation growing inside the ditch. For these reasons, the previously endorsed storm water treatment and management strategy can no longer be implemented.

A subsequent engineering redesign of the storm water treatment and management in the Lower site would collect the stormwater throughout the site, convey it through large diameter drainpipes to the Northern site perimeter, where the storm water would pass through a combination of vegetated buffer strips, below ground detention and manufactured treatment devices (MTD). The treated runoff would then be released at multiple locations via armored outfalls to vegetated areas inside the Kapa'a Stream corridor. The proposed storm water treatment and management system in the Lower site could only function if the full build-out finish grade could be elevated to overcome the approximate 20 feet of hydraulic energy head (e.g., hydraulic flow energy) required to convey runoff through the storm water system.

In the Lower portion of the project site, the SEIS No-Action Alternative would not provide the required elevated finish grate that is required to convey the runoff through the proposed storm water treatment and management systems. **Therefore, under the SEIS No-Action Alternative, the storm water treatment and management system would not have all the required structural BMPs which must be added to effectively mitigate storm water related impacts.**

The proposed storm water treatment under the SEIS Preferred Alternative represents a significant change from the storm water related site development and impact mitigation strategies disclosed in the 2011 FEIS. The proposed storm water strategies would have a higher efficacy of mitigating negative impacts of the runoff than the previously disclosed.

The proposed strategies for storm water treatment and management and irrigation with harvested rainwater are presented in Section 6.2 and 6.8 in this Draft SEIS document, respectively.

4.3.2 Impacts on Ground Water and Leachates from the Landfill Body

Section 4.3.2 of the 2011 FEIS described impacts on ground water and leachate from the landfill. The basic environmental processes and impacts remain the same under the Proposed Action described in this Draft SEIS. Impact mitigation measures, however, differ from the conditions disclosed in the 2011 FEIS.

Groundwater is an accumulation of water within underground soil structures. Groundwater recharge results from infiltration of surface water through surface layers and into underlying aquifers. The

capacity of aquifer recharge is typically affected by a variety of factors such as rainfall, topography, soil types, geologic structure, and ground surface cover. In the absence of significant disturbances to soil and topography resulting from construction, the capacity to recharge is usually affected by changes of ground surface cover, specifically resulting from the conversion of pervious to impervious surface cover.

While, in general, groundwater recharge is desirable, there are instances when groundwater quality can be negatively affected from leaching of material that is either deposited or is exposed due to excavation. The landfill area which will serve as development area for the proposed industrial park was created several decades ago by deposits of quarry overburden and tailings and some quantity of municipal waste. The landfill at the project site thus predates more recent standards of landfill development that protects the groundwater from landfill leachate by means of a sealing agent, either soil with low permeability, plastic filter membranes or other installed impervious barrier between the land fill body and the underlying groundwater. At the present state of the project site, a significant amount of rainwater could infiltrate within the pervious and non-paved areas into the landfill body.

This water volume therefore enters the landfill body, and it is assumed that groundwater movement is controlled by the indigenous soil composition, below the landfill material, since there is no seal below the landfill body. The groundwater movement in the Upper portion of the site is assumed to be towards the Kapa'a Stream corridor. The groundwater movement within the Lower portion of the proposed site is assumed to occur towards the East, following the natural slope, where the groundwater eventually flows underground towards the Kawainui Marsh or seeps into the existing drainage ditch and flows as surface flow to the Kapa'a Stream and further into the Kawainui Marsh.

The impacts of leaching of the landfill material to the groundwater depends on the type and age of deposits, the residence time of the water in the landfill body and the amount of water that infiltrates into the landfill body. Absorption of pollutants from buried material occurs when the surface of the material is not in equilibrium with the surrounding water, e.g., when there are physical or chemical processes that promote the release of material into the water. With time, equilibrium conditions are attained under which driving forces are not effective enough to promote the release of pollutants from the material particles to the water that seeps through the landfill. In the case of organic material, an equilibrium condition occurs when enough organic material is decomposed. In the case of organically inert materials, the equilibrium condition is attained when the capacity of the water to dissolve and entrain organic material has diminished under a certain threshold level.

At the project site, most of the landfill material was observed to be from organically inert material and thus is not subject to decomposition of organic material. Furthermore, the deposits of municipal waste are several decades decomposition of organic material should have already occurred over a long time period, where enough water was available through infiltration into the landfill body.

It is the position of the Applicants that sealing of the landfill areas is beneficial to reduce potential groundwater contamination from landfill material. For the Proposed Action, this would mean that the advantages of sealing the landfill surface area and avoiding water percolation into the ground outweigh the disadvantages of groundwater recharge with potentially contaminated water and the subsequent

flow of the groundwater towards the Kawainui Marsh or the receiving water in the Kapa'a Stream corridor.

Under the two SEIS alternatives, impacts to ground water and leachate from land fill would be the same for the Upper site. Under both alternatives, the Upper site would be nearly completely sealed with impervious pavement, save about a 0.3-acre vegetated swale upstream of an open detention pond.

These impacts from the two SEIS alternatives however differ for the **Lower portion** of the site.

The SEIS No-Action Alternative would have about 4 acres of vegetated and pervious area in the interior of the project site. This vegetated and impervious area could add to significant infiltration of rainwater and therefore cause harmful leachate generation with the described negative impacts.

The SEIS Preferred Alternative would seal almost the entire surface. The minor vegetated and pervious areas in the Lower site would be several vegetated buffer strips that would be used for LID storm water treatment and smaller plant beds along the building walls for decorative plants. Therefore, the SEIS Preferred Alternative would have fewer negative impacts on groundwater at and around the project site.

4.3.3 Floodplain Impacts

Section 4.3.3 of the 2011 FEIS described floodplain impacts of the proposed action. The impact conditions of the floodplains have not changed since the 2011 FEIS.

Potential impacts to the floodplains were evaluated using floodplain information and criteria established by the Federal Emergency Management Agency (FEMA).

Under both the SEIS No-Action Alternative and the SEIS Preferred Alternative, no parts of the proposed development footprint would be located within the designated 100-year floodplain zone. As a result, no adverse impacts to floodplains would occur from the actions proposed under this alternative.

4.3.4 Impacts of Proposed Site Drainage System and Mitigation Measures

Section 4.3.4 of the 2011 FEIS described the existing site drainage and the planned site drainage. This Section 4.3.4, of the SEIS, describes the new drainage system, related impacts, and impact mitigation. While the basic approaches of the drainage system remain, the actual design of the systems and the efficacies of the impact mitigations have significantly changed.

The 2011 FEIS described the basic function of drainage systems as collecting storm water from impervious surfaces and convey the storm water to discharge location to the receiving water. Drainage systems safeguard the avoidance of flooding on developments and are designed to handle so called "design rain event". These rain events assume certain recurrence intervals and rain durations, such as a . a "10 year" storm event. The 10-year recurrence interval implies that statistically there is a 10% chance per year that the design event will occur.

At the time, the 2011 FEIS was approved, the drainage infrastructure on the project site consisted of grass and concrete swales, drain inlets and two conventional, but small detention ponds. This infrastructure was limited to portions of parcel TMK 4-2-015:013 (former TMK 4-2-15:008) where all

existing warehouses were located at that time. The rest of the project site was primarily pervious gravel cover and lacked structural drainage system components. During heavy rain event storm water runoff from these areas left the project site via sheet flows over the vegetated site perimeter or via runoff over the Kapa'a Quarry Place roadway to a vegetated swale along that roadway.

The 2011 FEIS reported that the proposed drainage system for the proposed warehouse development expansion at the project site would differ from the then present system by adding drainage system components which would minimize the impact of runoff to receiving surface waters. The proposed drainage system expansion would incorporate structural and non-structural stormwater management strategies and would collect and treat all stormwater from impervious surfaces before discharge to the receiving waters. Under the 2011 FEIS the storm water design approach of the proposed drainage system was also to include some pervious surfaces, preferably vegetated pervious areas, to stimulate infiltration and loss of stormwater through evapotranspiration.

The Figure 4.3.4.1 below is also presented as Figure 6.2.2.2 in Section 6.2 of this SEIS document. Figure 4.3.4.1 shows the schematic storm water management of the site at the time the 2011 FEIS was accepted.

Identifier	Upper / Lower site	Description
A	Upper	The combined runoff from the paved traffic areas and building roofs discharged to the sloped and vegetated site perimeter through 6 drain inlets.
B	Upper	The runoff from the gravel areas discharged as surface sheet flows over the edge of the sloped and vegetated site perimeter
C	Upper	The combined runoff from the paved traffic areas and building roofs discharged as surface sheet flow over the edge of an existing 0.75-acre infiltration and detention basin.
D	Upper	A smaller portion of the gravel areas discharged runoff towards the roadway, overflowing the perimeter wall the runoff flowed across the road pavement and finally discharged to a vegetated swale along the Kapa'a Quarry Place. The vegetated swale also collects runoff from a portion of an adjacent land parcel as well as from Kapa'a Quarry Place roadway itself.
E	Lower	Runoff from the gravel areas discharged as surface sheet flows over the edge of site perimeter to the Kapa'a Stream corridor.
F	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to an existing drainage ditch along the Kapa'a Quarry Road.
G	Lower	The runoff in the vegetated swale along the Kapa'a Quarry Place entered a pipe conduit under the Kapa'a Quarry Place roadway and flows through a 300-foot drainpipe and was discharged to a vegetated swale inside the Lower site, downstream of the drainpipe terminus. In the vegetated swale the runoff flows towards the Kapa'a Stream corridor.

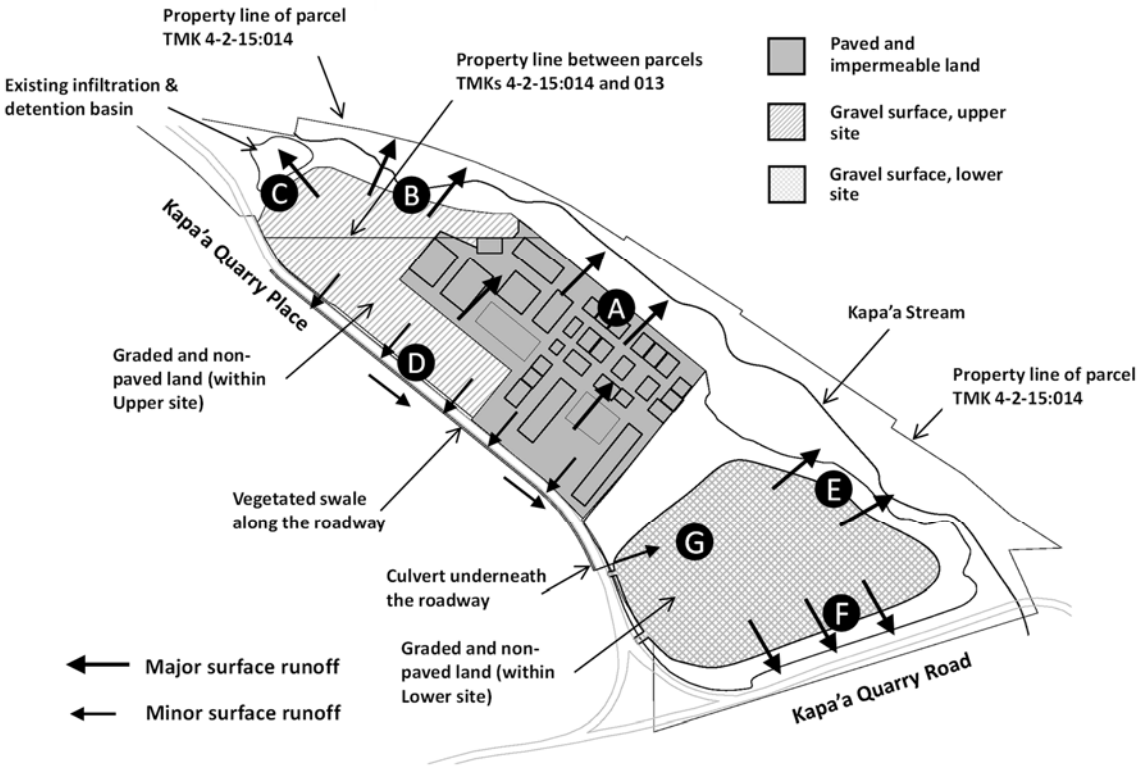


Figure 4.3.4.1: Schematic storm water management if the site at the time the 2011 FEIS was accepted. (Figure 4.3.4.1 is identical to Figure 6.2.2.2 in Section 6.2 of this SEIS document)

The 2011 FEIS described the preferred storm water treatment and management approach for the new development at the project site as follows:

The proposed drainage system strategies in the Upper and Lower portions of the site differed. The drainage system in the Upper portion of the site would collect all stormwater from impervious surfaces and convey the stormwater to detention ponds which served as treatment devices, and to a lesser extent for flood control, before the water would be discharged to the Kapa'a Stream corridor through armored spillways. An alternative drainage strategy in the Upper portion of the site would incorporate discharge into an existing infiltration and detention basin located at the Western boundary of the development footprint in parcel TMK 4-2-15:014 (portion of) and directly adjacent to the planned development.

The benefit of discharging the drainage collected from the new development in the Upper portion of the site to an existing infiltration and detention basin would be an increased LID treatment capacity of the basin. In the existing infiltration and detention basin solids would be eliminated before the stormwater eventually flowed underground or as surface discharge to the Kapa'a Stream. The 2011 FEIS stated that a detailed engineering study was required to confirm the assumptions of the design concepts.

The 2011 FEIS described that drainage from the Upper site would be conveyed in a combination of shallow swales in the paved areas or concrete channels which would collect the drainage of shallow

swales. The storm water system in the Upper site would then either enter one or more detention ponds before being discharged to the Kapa'a Stream corridor or would be discharged to the existing infiltration and detention basin at the Western boundary of the proposed development, as described before. In the final design, the selected drainage system might include the installation of stormwater debris separation units, which would be located upstream of the detention ponds or the drainage basin. The debris separation units would be able to remove from the stormwater all floatable, a percentage of suspended solids, sediments and oil and grease.

The 2011 FEIS described the drainage system in the Lower site as having a high efficacy in reducing possible impacts. Drainage from the impervious areas would be collected in swales and concrete channels and be conveyed to one extended detention pond from which the drainage eventually would flow into the existing drainage canal, at a location that would be near the confluence of the canal with the Kapa'a Stream. As part of the sustainability development strategy, stormwater would be collected from selected rooftops and stored for subsequent use in irrigation of the restored habitat areas on the vegetated site perimeter berms.

Several underground storm water harvesting vaults would be constructed at the site perimeter to take advantage of gravity flow of the stormwater to the storage locations, and to decrease the length of the irrigation lines and required pumping energy for the irrigation pumps. **Details of the proposed irrigation system is presented in Section in 6.8 of this SEIS document.**

As part of the 2011 FEIS storm water approach, during heavy storm events, when more stormwater runoff would occur than could be accommodated in the underground rainwater storage vaults, overflow would be conveyed to the detention ponds. The runoff in the detention ponds would then be discharged along with the portion of the stormwater that runs off areas that were not connected to the rainwater harvesting system.

The 2011 FEIS stated that even though the overall runoff volume generated in the proposed development would be higher than the current runoff rates, the nature of stormwater collection, conveyance to detention ponds, and timed release of the flood waters would result in effective flood control and better effluent quality. Therefore, this storm water approach would directly and positively impact the water quality in the receiving water. The detention and timed release of collected stormwater would allow settlement and removal of suspended solids in the extended detention ponds and ensure that the release of treated stormwater would occur after the storm event. In addition, installation of pre-treatment units upstream of the detention ponds oil water separators would increase the overall removal rate of the stormwater treatment.

In the 2011 FEIS proposed type of "detention" system was a "dry extended detention pond", which would provide two basic functions, stormwater flood control and removal of pollutants in the stormwater. The proposed extended detention pond system had the following components:

- Pre-treatment: Pre-treatment units would be installed upstream of the extended detention pond, e.g., stormwater would run through the pre-treatment units before entering the detention pond. The pre-treatment units would remove a significant portion of sediments, nutrients and oil-grease contained in the stormwater.

- Treatment inside the detention pond: Treatment features of the vegetation inside the extended detention ponds could remove quantities of pollutants and settleable agents from the stormwater.
- Conveyance of the stormwater in detention pond: The proposed "dry" extended detention pond was designed to accommodate and store a "design storm event", according to County rules. For smaller flows of runoff stormwater from lesser storm events, the detention ponds had "pilot channels" that ensures adequate conveyance into, through and out of the detention pond.
- Discharge outlet system: The discharge outlet from the detention pond to the Kapa'a Stream would be through a discharge structure that allows a certain "safe discharge" from the detention pond into the Kapa'a Stream.

For the Lower site, the storm water treatment and management system under the updated site development plan would pursue the same goal of significant reduction of negative impacts for storm water discharges as presented in the 2011 FEIS. The new storm water system under the updated site development would still treat all runoff from impervious surfaces before release to the receiving water, would use harvested rainwater for irrigation, and would detain quantities of runoff for controlled release to lower stream bed erosion.

But the details of the updated storm water system for the Lower portion of the project site would have significant differences from the storm water system described in the 2011 FEIS and the 2017 Minor Modification to the 2014 SMA (2014/SMA-27). The main differences are described below:

- The new storm water system would have to treat storm water runoff from a larger impervious area than the storm water systems described in the 2011 FEIS and approved under the 2014 SMP. The updated site development plan has less landscaped area in the interior site.
- The new proposed storm water system would not have above ground extended detention ponds. Concerns expressed by the US Fish and Wildlife Service of attracting listed water birds to open water surfaces within the project site have caused all detention volumes to be underground.
- The new storm water system would not have vegetated swales but below ground drainpipes. Vegetated swales require a minimum slope that is larger than the slopes of large diameter drainpipes. Therefore, drainpipes require less hydraulic head for the water conveyance from the inlets to the treatment and detention vaults.
- The New storm water system would have treatment units that include several vegetated buffer strips (a LID treatment strategy) and several manufactured treatment devices (MTD). The combined treatment efficacy of the vegetated buffer strips and the MTDs would significantly surpass the treatment capacity of the older storm water system.
- The new storm water drainage system would provide more detention volume than the previously approved system. The new approach would use below ground vaults that have impervious walls and bottom. The previously approved storm water system had pervious vaults because infiltration of the detained water adjacent to the site perimeter berms was the preferred approach.
- The previously approved storm water system had a vegetated swale upstream of the detention vaults; therefore, all storm water runoff was first passed through a LID treatment process before being detained or directly discharges as peak flow during heavy rain events. With the proposed

vegetated buffer strips the New storm water system similarly would have a LID treatment process upstream of the detention vaults and filtering treatment of the MTD.

- For the reasons mentioned above, the treatment efficacy of the new storm water would better than the storm water system disclosed under the 2011 FEIS and the one approved under the 2017 SMP Minor Modification.

Figure 4.3.4.2 is an example for the description of the New storm water system of the Lower site. It illustrates the comprehensive New storm water treatment and management system for the Lower site. (Figure 4.3.4.2 is also presented as Figure 6.2.4.8, in Section 6.2). Note: The updated storm water system for the Lower site has four instead of the previously three drainage areas. Figure 4.3.4.2. displays the three drainage areas. Since Figure 4.3.4.2 only serves as an example, the figure was not changed.

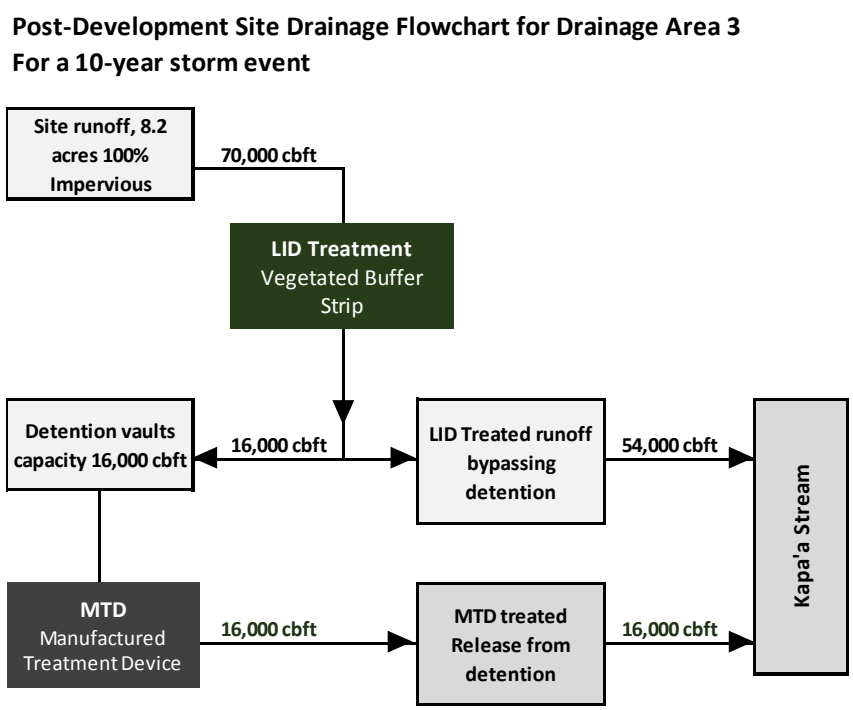


Figure 4.3.4.2: Flow diagram for Drainage Area 3; used for illustration
(Figure 4.3.4.1 is identical to Figure 6.2.4.8 in Section 6.2 of this SEIS document; Note: this figure portrays the old drainage area 3)
Figure 4.3.4.2 is presented as an example of the New storm water treatment and management system for the Lower portion of the project site.
The flow chart describes the different elements of the integrated storm water system. More design details of the New storm water system are presented in Section 6.2 of this SEIS document.

Impact to construction related storm water discharge from the site would be mitigated through effective construction BMPs to avoid entrainment and erosion of significant amounts of exposed soils on the site.

Construction stormwater BMPs would include the following:

- Pre-construction planning to determine scope of erosion control: development of an erosion and sediment control plan (would be required for permit). Preserving existing vegetation wherever possible - established populations of trees, bushes, and grass could help keep erosion to a minimum.
- Limiting disturbed areas through phasing. No disturbed surfaces should be left without erosion control measures in place.

- Providing primary and secondary containment for fuel and other hazardous materials, would be placed around any storage tanks.
- Installing clean water diversions, sediment traps/ basins and stabilizing drainage channels with grass, liners, and silt check dams before excavation, fill, or grading work begins. Diversion berms or ditches could avoid upland runoff from flowing through the construction site.
- Installing construction entrances and controlling dust to avoid mud tracked on paved roads. Mud on roadways that originates from construction is annoying and unsafe.
- Installing vegetated buffers around the construction site to avoid volume sheet flows from moving across cut or fill areas and helping to filter and trap sediment before it can move into ditches, channels, and streams, respectively.
- Protecting exposed soils with seed, mulch, or other products (e.g., erosion control blankets, turf reinforcement mats, temporary plastic covers).
- Using silt fences and other sediment barriers below (downhill from) areas of bare soil to avoid sediments from escaping the construction sites and flowing into downhill areas of receiving waters.
- Using temporary down drains using plastic pipe or rock lined drain channel should be used to stabilize sloped faces of temporary channels that carry water down slopes.
- Using steep slope protections: rock-filled, stacked gabion baskets or retaining walls should be used to protect steep slopes that cannot be effectively protected with other measures.
- Protecting Culvert and Ditch Inlets and Outlets; Sandbags, stone aprons or other measures should be placed around inlets and outlets to allow ponding for energy.

4.3.5 Wetland Impacts

The 2011 FEIS described that the Proposed Action would not result in loss of wetlands, since the development footprint was entirely outside wetlands boundaries. Only the Lower portion of the project site bordered at wetland areas in the Kapa'a Stream corridor. This observation was based on a wetland reconnaissance at the time of the 2011 FEIS.

Following the 2011 FEIS, parts of the former parcels TMK 4-2-15:06 and 012 (the parcel 4-2-15:012 was designated as 4-2-15:001 (portion of) in the 2011 FEIS) were rezoned from P-2 to I-1. The boundaries of the rezoned land were selected to coincide with the physical boundaries of the landfill to ensure that previously vegetated and open space would remain in its natural state. For the Lower portion of the site this meant that the boundary of the project site, which is the boundary of the rezoned land, would coincide with the limits of the Lower landfill area, and therefore remain outside wetland areas.

The 2011 FEIS stated that if wetlands were impacted, according to the Department of the Army, Section 404 Clean Water Act, an Individual Permit or Nationwide Permit issued by the Corp of Engineers would be required for unavoidable impacts.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support vegetation that is typically adapted to life in saturated

and/or partially anaerobic soil conditions. The determination if an area is described as a wetland is based on three criteria: the presence of hydric soils, the frequency of inundation or other wetland hydrology features, and the presence of typical hydrophytic vegetation.

Under the updated site development plan the project site boundaries would be outside the wetland areas of the Kapa'a Stream corridor. Both the SEIS Preferred Alternative and the SEIS No-Action Alternative have the same boundary. Grading would have to occur inside the rezoned land and the limits of grading would need to be protected to avoid soil being spilled into wetland areas.

Main types of negative impacts on the wetland, originating from the development in the project site, include the following:

1. Filling and grading inside wetland areas
2. Removal of vegetation
3. Changes in water levels or drainage patterns
4. Pollutant discharge through storm water, including storm water contamination by excess nutrient, organic matter and TSS
5. Pollutant discharge

Of these main negative impacts, all would be avoided or at least effectively mitigated. At present surface runoff from the Lower Site to the Kapa'a Stream corridor occur over a distance of about 800 feet along the Norther site perimeter. A wetland reconnaissance indicated that the proposed outlets for the new storm water system in the Lower site would discharge the treated storm water to upland and not wetland area. Since conditions are changing inside the Kapa'a Stream corridor, a more detailed wetland delineation would have to determine that the assumptions of discharging into upland and not wetland area are still valid.

The original Lower site topography, before the landfill was created, formed a gentle slope under the project site towards the North-East corner. With much of the original soil under the landfill having low permeability, it can be assumed that leachate formed in the land fill would migrate towards the North-East of the site, toward the wetland areas. With the near complete impervious cover of the project site, no or significantly less leachate would be created. Therefore, this potential harmful impact to the wetland would be avoided under the upgraded site development.

The FEIS 2011 described recommended Standard Best Management Practices that followed the U.S. Fish and Wildlife recommendations. These recommendations still are valid and will be followed under the updated site development and storm water system:

- Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.
- Dredging/filling in the marine/aquatic environment shall be designed to avoid or minimize the loss of special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.

- All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
- No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channel, wetlands, etc.) or on beach habitats.
- All debris removed from the marine / aquatic environment shall be disposed of at an approved upland or ocean dumping site.
- No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter control and developing a Hazard Analysis and Critical Control Point Plan.
- Fueling of project related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases.
- Any under-layer fills used in the project shall be protected from erosion with stones and/or core-loc units as soon after placement as practicable.
- Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Figure 4.3.5.1 shows a portion of the National Wetland Inventory (NWI) map for the vicinity of project site. The map indicates the Kawainui Marsh as the only wetland in the vicinity of the marsh which is listed in the NWI map.

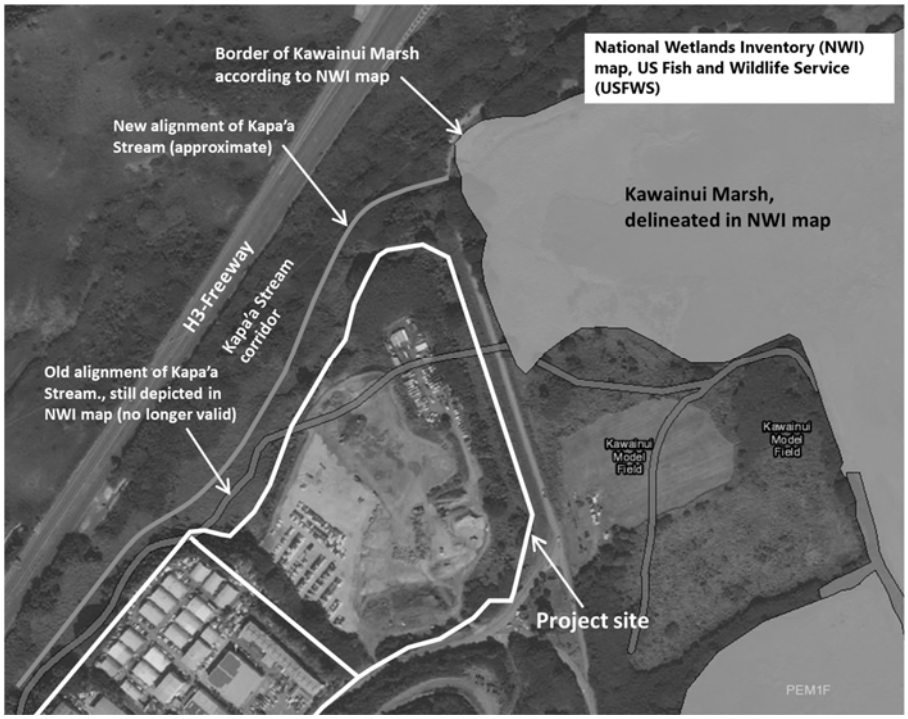


Figure 4.3.5.1: Depiction of the location of the delineated wetland in the vicinity of the project site (New Figure)

Note: in the NWI map the old Kapa'a alignment is still shown although the stream bed was shifted to the north by the creation of the landfill in the Lower site approximately 60 years ago.

4.3.6 Impacts on Kapa'a Watershed

Section 4.3.6 of the 2011 described impacts on the Kapa'a Watershed through the contribution of TSS load from the project site. The 2011 FEIS used a Kapa'a watershed water quality report by the State of Hawaii Department of Health report (DoH, 2007) to quantify TSS impacts on the watershed.

The 2011 FEIS, measures were described to significantly lowered the amount of TSS in the stormwater runoff from the project site. Under this 2011 FEIS approach, it was predicted that the proposed storm water mitigation measures would reduce the TSS load of the runoff between 60 percent and 80 percent for the Upper and the Lower portions of the site, respectively.

The 80 percent reduction of the TSS load for the Lower site was considered a conservative estimate, since the 2011 FEIS stated that the actual TSS of the two-tiered storm water could be higher than 80%. The average 60 %removal rate for the Upper site was also considered somewhat conservative, assuming the use of the existing infiltration and detention basin for an area of about 5 acres would be well above 60% while discharge from other parts of the would be somewhat less.

Figure 4.3.6.1. reprinted from the 2011 FEIS, illustrates a direct comparison of predicted magnitudes removal rates of TSS under two flow conditions in the Kapa'a water shed. These two flow conditions represent the baseline flow and the peak (2%) conditions. Figure 4.3.6.1. suggests that the predicted reduction rates were 69% and 79% for the baseline and the peak (2%) flows, respectively.

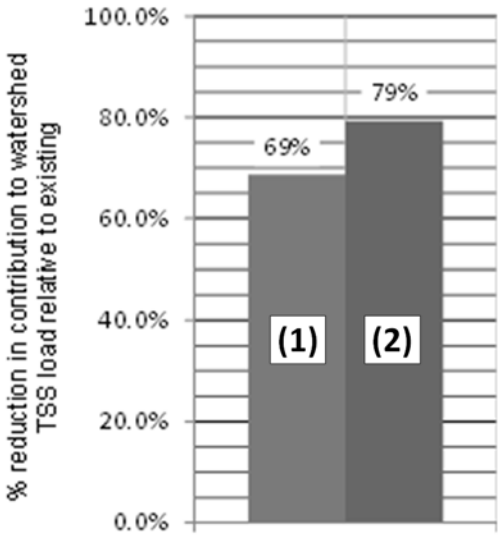


Figure 4.3.6.1: Comparison of alternatives for magnitude of reductions in TSS discharge from the proposed site

(source Figure 4-6 of the 2011 FEIS)

Legend

(1) Reduction in base TSS

(2) Reduction in peak TSS

For both SEIS alternatives, the removal rates are expected to be at least as good as the predicted removal rates described in the 2010 FEIS. The storm water treatment and management technologies to be used in the new storm water systems would have a higher treatment efficacy than the system described in the 2011 FEIS. Therefore, considering all the benefits of the new storm water system described in earlier sections on mitigating impacts, **negative impacts on the Kapa'a Watershed should be less or at least as low as described in the 2011 FEIS.**

4.4 Impacts on Biological Resources and Proposed Mitigation Measures

Section 4.4 of the 2011 FEIS described possible impacts of the Proposed Action on vegetation, wildlife and threatened and endangered species. Under the 2011 FEIS site development plan, the site development footprint would only use land that was created by landfill and which at the time of the 2011 FEIS had no or little vegetation.

4.4.1 Impact on Vegetation

Section 4.4.1 of the 2011 FEISI described that the landscaped areas at that time would not be affected by the proposed action. Only impact on natural vegetation was evaluated under the 2011 FEIS. Figure 4.4.1.1 shows 7 natural vegetation areas, as described in the 2011 FEIS. The 2011 FEIS described impact on these seven natural vegetation areas as described below:

The natural vegetation areas A, B, C and D, with a combined area of some 8.0 acres, would be affected by the proposed development. A portion of area E, located in the Upper portion of the site, would be converted to impervious developed land, with that portion of area E represented a vegetated berm that was removed since the 2011 FEIS. The sections A, B and C, all located at the perimeter of development footprint in the Lower portion of the site, would be restored with native or adaptive plants. Using native and adaptive plants in lieu of introduced plants has the significant advantage that typically less irrigation is used as well as less fertilizer and pesticides.

In the Lower site under the 2011 FEIS, the earth berm within area A would be increased in size and height to function as effective vegetative buffer zones separating the Lower portion of the site from the quarry road and the western parts of the Kawainui Marsh. The improved earth berm in Section A would be replanted with native or adaptive plants, including larger trees to provide a wind break on the new earth berms, which would also mitigate visual impacts. Area B would be augmented with native and adaptive plants to form an effective buffer between the adjacent wetland area in the stream corridor and the development footprint. Area C, which was a sloped area that separated the Lower from the Upper portions of the would be improved by restoring the area with native and adaptive plants. The larger trees within area C, which would be preserved in the habitat restoration effort.

Area F included the existing infiltration and detention basin. Area G included several large trees along the Kapa'a Quarry Place roadway. The 2011 FEIS stated that no significant adverse effects to vegetation would be expected from development of the Proposed Action. Rather, planting native shrub and tree species in the areas of habitat restoration efforts would provide a positive impact on the vegetation around the proposed site.

Figure 4.4.1.1: 7 natural vegetation areas that surrounded the proposed (source Figure 4-7 of the 2011 FEIS, annotated)

Under the updated site development, and for both the SEIS Preferred Alternative and the SEIS No-Action Alternative plan, the areas A through F would have the same small impacts on the vegetation. Some of the larger trees in area G were removed after the 2011 FEIS was approved to follow the recommendation of the DPP to improve sight distance for the Upper roadway entrance to the Upper portion.

The planned vegetation restoration for areas A through C differ between the two SEIS alternatives. The new vegetated berms in areas A and B would be higher and wider under the SEIS Preferred Alternative, thus covering more area and newly planted vegetation. Area C would be somewhat smaller under the SEIS Preferred Alternative and would involve more grading on the sloped land; therefore, more removal and restoration of vegetation within that area would be needed.

4.4.2 Impacts on Wildlife

Section 4.4.2 of the 2011 FEIS stated that the proposed project site was not considered to have important wildlife habitat value, since the project site had been previously developed, graded and was practically void of existing vegetation. The conditions under the updated site development plan would stay the same.

The 2011 FEIS described that a small population of urbanized small mammals and birds could be found within or at the perimeter of the proposed development, mostly inside vegetated areas. It was expected that birds or small mammals would be temporarily displaced during the construction but would return after construction was completed and when the open space would again be available as habitat.

The area around the Lower portion of the site would be restored with native and adapted shrubs and tree species and the vegetation density would be increased. The vegetative buffer zones which would be developed within the areas A, B and C (see Figure 4.4.1.1) would serve as improved habitat for wildlife that is presently found on the site. It was projected that wildlife would be attracted to these newly

created natural vegetation areas at the site perimeter. No forested or natural vegetation area would be converted to developed land and therefore impacts to migratory birds are not expected.

The 2011 FEIS stated the fact that waterfowl might be attracted to wet ponds with free water surfaces needed to be considered in the design of the planned stormwater detention ponds. Communication with the U.S. Fish and Wildlife Service had indicated the possibility of an impact on the water bird community, especially attracting endangered water bird species to water ponds, even to those ponds which have only intermittent free water surfaces. In the 2011 FEIS, it was pointed out that the final design of the detention ponds would consider mitigation and avoidance measures to oppose attraction to the detention ponds.

Under the updated site development plan, and for both the SEIS Preferred Alternative and the SEIS No-Action Alternative, impact to wildlife is also predicted to be small. Under both SEIS alternatives the site perimeter would provide habitat after completion of the perimeter berms. Also, under both SEIS alternatives, light pollution mitigation measures would be implemented to reduce negative impacts specially to migrating birds.

Under the SEIS Preferred Alternative, there would not be sizable, landscaped areas within the site interior. Therefore, less wildlife would be attracted to the site and thus less impacts on wildlife would occur.

4.4.3 Impacts on Aquatic and Wetland Habitat

As described under the 2011 FEIS, by implementing the proposed stormwater management practices, no significant adverse impacts to aquatic and wetland habitat would be expected. The project sites would not develop any portion of wetland areas, the Kapa'a Stream or the drainage canal along the quarry road, all surface water features that provide habitat for aquatic species. The proposed low impact development approach in the Lower portion of the site would generally provide ample buffer zones between the development footprint and the aquatic habitat.

Since the Lower site is converted from presently pervious and graded to future impervious area, the runoff rates and the amount of sediments and pollutants transported to the receiving waters could affect aquatic habitat conditions. These potential adverse impacts must be mitigated by appropriate stormwater management practices, which were considered for the proposed action. The construction of the vegetative buffer zones around the Lower portion of the site would occur before grading of the site. The buffers, which include earth berms and dense vegetation, would serve as organic filter which would effectively diminish the amount of sediment that is transported to the receiving waters during construction, and during operation of the proposed industrial development.

During construction, soil would be exposed and there would be an increased potential for erosion and transport of sediments into the adjacent receiving water, which could negatively affect aquatic habitat conditions. Under the Preferred Alternative comprehensive erosion and sediment control plans would be implemented to significantly reduce erosion of exposed soils, slow the stormwater discharge rate, and capture and contain eroded soils and concentrated nutrients before they enter the receiving waters.

The 2011 FEIS stated possible attraction of water birds to ponds with free surface had to be addressed in the design of the detention volumes Lower portion of the site.

Under the updated site development plan and under both SEIS alternatives, effective storm water pollution measures would be implemented during construction to mitigate negative impacts from polluted storm water runoff on the aquatic resource and the wetland habitat.

Under the SEIS Preferred Alternative, the storm water treatment and management would significantly reduce negative impacts of the runoff relative to water quality and stream bed erosion. As described earlier in this document, the previously approved stormwater system for the Lower portion could not be installed under the SEIS No action Alternative. The reason is the fact that not enough hydraulic head would be available with the full build-out finish grade of the SEIS No-Action Alternative.

4.4.4 Impacts on Endangered Species

Section 4.4.4 of the 2011 FEIS described that possible impacts to federally listed or endangered species requires communication with the U.S. Fish and Wildlife Service (USFWS), as well as mitigation measures.

As the 2011 FEIS reported the project site was not considered habitat for endangered species, but the USFWS has determined that four federally listed water birds have a habitat in the adjacent Kawainui marsh and the wetland area in the Kapa'a Stream corridor. The four endangered water birds are the Hawaiian stilt, Hawaiian moorhen, Hawaiian coot, and Hawaiian duck. The USFWS has communicated that recommended mitigation measures should be considered in the DEIS to minimize negative impacts to water birds.

The Applicants were in communication with the USFWS about earlier plans for the site development at the project site. The USFWS recommended several measures to avoid adverse impacts to water birds. All but one of the USFWS recommendations were concerned with the previously planned 15-acre wildlife habitat project that was planned in conjunction with the wetland restoration. The wildlife habitat project was not pursued further by the Applicants at the time of the 2011 FEIS, and therefore these three mitigation measures no longer apply.

The remaining measure required by USFWS addresses possible adverse impacts to water birds from open detention ponds or other water bodies within the project site with open water surfaces which might feature permanent or intermittent water ponds. Water birds might be attracted to these water features, which would make them more prone to predators at the project site. The conclusions of the 2011 FEIS indicated that the USFWS recommendation would be considered in the final design of the detention ponds and include incorporate suitable avoidance measures.

Under the updated site development, both SEIS alternatives do not include open detention ponds but plan underground detention vaults instead. With this modification of the site design the USFWS concerns were followed.

Also, under both SEIS alternatives, possible light pollution impacts on endangered species would be mitigated. After the 2011 FEIS was approved an external lighting design concept for the Lower site was approved by the Accepting Agency (SDC,2016,A). The selected lighting design described in the report

was consistent with the sustainability plan of the Lower project site. The lighting plan suggested to install shielded light and preferably low-pressure sodium lamps which have advantages to mitigate light related impacts on wildlife because of the specific mono-chromatic light spectrum.

4.5 Impacts to Cultural Resources

Section 4.5 of the 2011 FEIS described that prior communication with the State Historic Office has established the fact that no places of cultural or archeological significance are within the development footprint of the proposed project. The project site is a landfill area that was established several decades ago, and the construction of buildings and the development of the industrial park on these man-made areas will therefore not have directly adverse effects on historical places.

As delineated in Section 3. of this SEIS document, most of the sites of historical and cultural significance in the vicinity of the proposed site are in the southern part of the Kawainui Marsh, with most of these identified sites being more than one mile away from the proposed site. Therefore, the proposed project would have no adverse effect on these sites.

The only site of historical and cultural significance that is near the project site is the Pahukini Heiau. Figure 4.5.1. illustrates the vicinity map of the Pahukini Heiau to the project site. The Pahukini Heiau was built under the auspices of the High Chief Olopana in the 12th century. The Pahukini Heiau is a Luakini or state-class Heiau, where important state matters, including preparation for war, were conducted.

The Heiau is located on the site of a now closed landfill belonging to the City and County. The access to the Heiau is restricted but a visit can be arranged through the office of the Kapa'a Refuse Transfer Station where the access gate is located. The closest distance from the Heiau to the project site is approximately 700 feet. The representative distances to the centers of the Upper and Lower portions of the project site are 1,400 feet and 2,600 feet , respectively. The proposed project would not limit access to the Heiau nor would in any way affect the physical site of the Heiau.

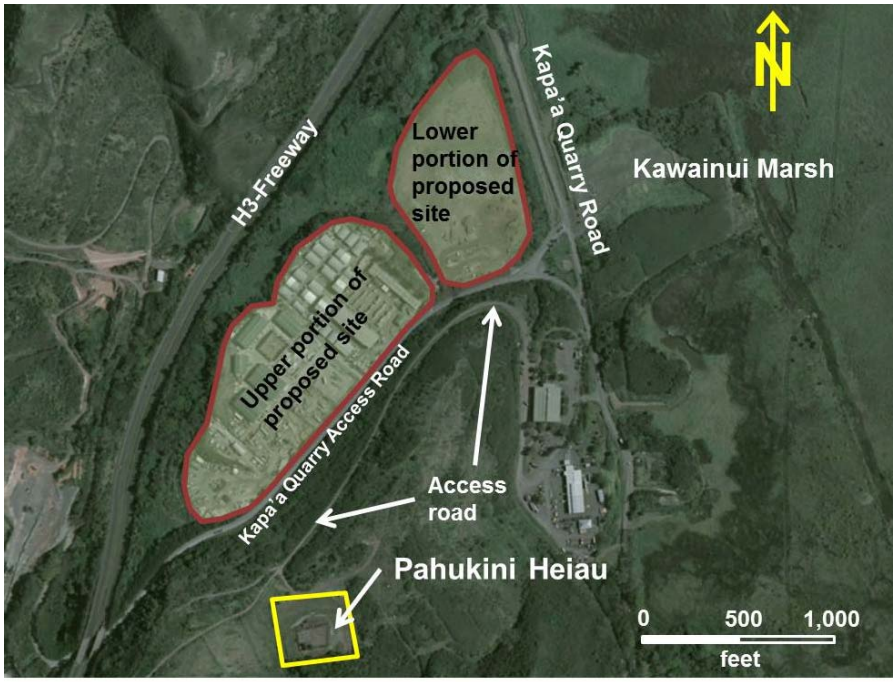


Figure 4.5.1: Vicinity map of Pahukini Heiau

(source Figure 4-8 of 2011 FEIS)

As reported by the 2011 FEIS, the project site cannot be seen from the site of the Pahukini Heiau, since the project site is hidden behind a screen of mature trees and a dense vegetation of shrubs.

The appearance of the planned warehouse structures would not have to conform to any historical buildings at or near the site. The appearance of the valley is determined by the ongoing industrial activities, and the planned warehouse development or industrial park would fit in the established surrounding.

Under the updated site development plan, no changes in visual impact of the project site on the Pahukini Heiau would occur.

4.6 Impacts to Air Quality

Section 4.6 of the 2011 FEIS described impacts to air quality. The basic premises of air quality impacts and related mitigation efforts at the site have not changed under the updated site development plans.

Air quality impacts typically can be categorized as follows:

- Air quality impacts during construction
- Air quality impacts during operation
- Indoor air impacts

<u>Air quality impacts during construction</u> would vary with the scope and length of construction activities. Typical air quality impacts during construction would primarily be from exhaust of heavy machinery used in excavation, grading and other activities, from exhaust by construction-related heavy truck traffic

on adjacent roadways, and from added dust during earth moving and periods when lighter soil fractions are exposed to wind-born entrainment and transport.

The construction schedule for the development features activities that stretch over several years, with periods of more intensive construction efforts during site development. The periods of more intensive construction efforts for grading, roadway construction and installation of all infrastructures would be followed by the construction of the individual warehouse structures.

The most adverse impact would occur during a short duration of site development. Impacts on air quality associated with construction of the individual warehouse structures would include the time that is needed to build the outer shell of the warehouses, followed by finishing of the interior work inside the buildings. For this SEIS, the following are air impact mitigation measures which would be implemented:

- Control dust (e.g., fine water sprays), avoid entrainment of dust by wind through appropriate means such as fine water sprays or placing of fine mesh screening close to the dust source, or cover piles of building materials like cement, sand, and other powder.
- Continuously inspection of sources of dust from exposed earth and building materials and implement targeted mitigation.
- Cover trucks loaded with construction materials.
- Prevent spills and exposed surfaces of agents which could generate air impacts, especially from hazardous agents such as VOCs.
- Proactive measures to prevent site contamination by and atmospheric exposure of fuel, solvents, and other agents.
- Vegetative buffer zones with berms around the proposed site can mitigate air quality impacts since they act as wind breaks that reduces the probability of stronger winds entraining and transporting dust and hazardous particles from the site.
- Use low-emission diesel fuel and construction vehicles that incorporate particulate filters and catalytic converters; ensuring that engines are well-tuned and other maintenance is carried out to limit unnecessary burning of fuel.
- No burning of any materials on site.
- Implement waste management control to limit the heavy truck traffic required to transport waste off the site and deliver material that could also be reused at the site.
- Recycle organic waste in form of green waste to produce topsoil for the restored habitat or landscaped areas, thus avoiding the removal of organic waste or marginal topsoil from the site and transport of topsoil to the site.
- Contractors to offer shuttles of employees during construction rather solely relying on individual transport of all construction personnel.

By implementing the proposed construction plan and schedule, it is expected that adverse impacts on the air quality from the site during construction is limited.

<u>Air impacts during operations</u> of the proposed industrial park would be limited and the primary contributor of adverse air quality impacts would be through increased traffic on the adjacent roadways,

where heavy truck traffic is expected to add most of the new air quality impact. Other air quality impacts would be through release of harmful agents such as solvents, paints, and other agents, especially those containing VOCs. The proposed industrial development will not burn any fuel on the site to power machines or generate electricity or process heat, except for the diesel operated fire pump in the fire water booster pump house.

Measures to mitigate air impacts during operation would include advising businesses leasing space in the new industrial development about maintaining and tuning the engines of their vehicles (e.g., heavy trucks, forklifts). The amount of discharge of exhaust in heavy trucks is a function of the power applied and the duration of operation. The amount of exhaust from internal combustion engines can be reduced if engines are not idling unnecessarily and if trucks avoid strong acceleration and high speeds. Air impacts from cars and light trucks can equally be reduced by advising the occupants of the park and customers not to idle the engine unnecessarily and keep their engines well-tuned.

Since the SEIS Preferred Alternative would add more warehouse space in the Lower site than the SEIS No-Action Alternative, and under the assumption that impacts are proportional to the total size of the warehouse footprints, impacts would be bigger under the SEIS Preferred Alternative.

Effective impacts mitigation would be as follows:

- Attune and educate occupants of the proposed industrial development to follow low impact development and operation in an effort endeavor the lowest air quality.
- Prevent open burning of any material on the site.
- Prevent the exposure of harmful agents that could be released to the atmosphere.
- Prevent the inappropriate and unsafe handling of any fuels, solvents, and any other harmful agents.
- Advise businesses that lease space to operate their commercial cars vehicles with well-tuned engines in and encourage employees to do the same with private vehicles.
- Promote the use of low emitting cars by providing incentives such as preferred parking.
- Use electric operated maintenance vehicles.

Indoor air quality impacts are an often neglected or insufficiently considered feature in the construction and operation of commercial and industrial developments. The importance of indoor air quality has been gaining more attention within the past few years, and indoor air mitigation is becoming a more important issue. Effective impact mitigation measures have become more accessible such as avoiding pollutant emitting materials in furniture and building interior and increasing ventilation rates.

4.7 Impacts from Noise and Noise Mitigation

Section 4.7 of the 2011 FEIS described impacts of noise at the project site and noise mitigation measures.

The type of noise impacts considered in the SEIS Section 4.7 are the same as described under the 2011 FEIS. Noise impacts are categorized as construction noise and noise during operation. Noise impacts and sources are similar between the two SEIS alternatives, since both alternatives require site development work using heavy equipment and delivery of construction materials to the proposed site. The 2011 FEIS

stated a requirement that was expressed by the Accepting Agency stating that "Project activities shall comply with the Administrative rules of the Department of Health; Chapter 11-46 Community Noise Control".

Noise impact during construction: The planned construction work would see two primary phases of noise impact. First, the site development activities would be carried out as the initial work that would include the use of heavy machinery such as backhoes and trucks for clearing, grading and excavation. Once the entire site, or parts of the site, is/are prepared, individual warehouse structures would be erected. The construction of the warehouse structure would also include the use of heavy equipment, such as cranes and trucks, but the noise level created by these activities would be significantly less than during the first phase of construction.

It is expected that the first phase of the construction, the site preparation, would be completed within approximately 3-4 months. The follow-on phases of construction of the individual warehouses and the traffic areas and utilities in the immediate vicinity of the warehouses would be carried out over a long duration of several years. Warehouse space would be added to the development in accordance with the absorption of the available warehouse space by the local market. This does not imply that construction noise would occur continuously over a span of several years. Rather it is expected that construction noise from individual warehouses would only be noticeable during about 20 weeks of the year.

It should be noted that the noise receptors – occupied buildings – are in an industrial park where the occupants are used to noise levels, which are higher than in residential areas.

The type of noise sources that would be used during construction at the proposed site would involve heavy equipment such as backhoe, trucks, graders, and other equipment. These types of equipment are typically generating maximum equipment noise level and noise levels 50 feet from the source of between 80 and 70dBA, depending on the equipment used . With increasing distance from the noise source, the noise level declines. As a general rule, the noise level decreases approximately 6 dBA with the doubling of the distance; this means that as an example a truck that generates 72 dBA at a distance of 50 feet generates 66 dBA at a distance of 100 feet. Table 4.7.1 suggests expected noise levels for heavy equipment that would likely be used in construction at the proposed site.

Since the construction site is not located near a residential area or other locations with sensitive noise receptors, the anticipated noise levels are expected to be within allowable levels. If it is deemed that the construction-related noise would be high enough to warrant noise reduction measures, the following actions could be considered:

- Limit the type of noise to certain times during the day
- Temporary noise barriers to shield sensible receptors or noises sources that are operating close to occupied buildings
- Schedule operations that are especially noisy operations to occur at the same time during the day
- Use low noise emission equipment, such as encapsulated compressors.

Table 4.7.1: Expected noise levels of heavy construction equipment (Source Table 4-1 in 2011 FEIS)

Type of construction equipment	**Noise Levels at 50 feet, dBA** hourly equivalent	**Noise Levels at 100 feet, dBA** hourly equivalent
Backhoe	78	72
Front loader	76	70
Bulldozer	79	73
Heavy dump truck	73	67
compressor	75	69
Vibrator roller	77	71
Concrete pump	78	72
Flatbed truck	72	66

Since the construction would occur adjacent to environmentally sensible area, wildlife might be affected by elevated noise levels. It is expected that urbanized wildlife that is presently finding habitat at the proposed site would temporarily leave the area where the construction takes place and would return once the construction noise stops.

Traffic related noise: The impact due to traffic related noise would occur in an area that is already experiencing traffic related noise. The representative location to compare adverse impacts between existing traffic noise levels and future increase noise levels is at the Kapa'a Quarry Road North of the intersection with the Kapa'a Quarry Place.

The 2011 FEIS described traffic noise projections that differentiated between background traffic and project related traffic. Projections of the background traffic included forecast of the traffic volume on the roads adjacent to the project site, but without the proposed expansion off the proposed additions of warehouses. Projections of project related traffic estimated traffic volumes as a function of the total size of the project.

Under the updated site development plans the SEIS Preferred Alternative would cause a higher traffic volume than under the SEIS No-Action Alternative, because more warehouse space would be added in the Lower site than under the No Action Alternative. Since the traffic noise from heavy trucks exceed the noise created by cars, and the SEIS No-Action Alternative would have a base yard which inherently creates more heavy truck traffic than warehouses, the traffic noise impacts would somehow balance out between the two SEIS alternatives.

The 2011 FEIS projections for the background traffic saw a 23% increase by the year 2026, and the project-related traffic was predicted to grow by about 100% relative to the condition in 2016.

The increase of traffic volume can be used to assess the anticipated increase in traffic noise impact. As a general rule, traffic volume must double to produce a three dBA increase in traffic related noise. The level of 3 dBA is the level that is discernable to the human ear. Applying the general rule of an increase in traffic noise with doubling of the traffic volume and an increase of about 3 dBA being within the

threshold for perception of increase in noise, the 2011 FEIS concluded that slight adverse noise level changes might be noticeable after the completion of the entire project.

The 2011 FEIS estimated the traffic induced noise at about 60 dBA. Applying the general rule, the noise level at project full build out after 2026 was predicted to be equal to about 63 dBA. This level of noise is about average for urban traffic conditions. At the time of completion of the development in the Upper portion of the site, no adverse traffic noise would be discernable to the human ear.

The 2011 FEIS pointed out that the traffic impact assessment study used a trip generation rate that did not consider possible reduction of traffic due to efforts to promote alternative transportation. Both SEIS alternatives would implement sustainability recommendation which included incentivizing carpooling, shuttle service and the use of bicycles to visit the proposed industrial park. The actual traffic volume at project full build out could therefore be somewhat less than expected under the traffic impact assessment report (TIAR) which was referenced in the 2011 FEIS.

The 2011 FEIS expected that the traffic related noise level of about 63 dBA would not require mitigation measures since the proposed location is not close to residential areas and sensitive noise receptors. If noise mitigation measures would seem necessary as the project approaches completion, the following measures proposed in the 2011 FEIS be appropriate to Lower any traffic related adverse noise impacts:

- Lowering the speed limit on the quarry road since traffic noise increases rapidly with speed.
- Implementing sound adsorbing surfaces along the road (e.g., a line of trees along the makai side of the quarry road to mitigate propagation of sound towards the marsh).
- Resurfacing the road.
- Implementing dedicated left turn lanes on the quarry road to the quarry access road to avoid deceleration and subsequent acceleration for northbound traffic on the quarry road.

In addition to the primary noise sources, the traffic noise generated on the quarry road and quarry access road, the 2011 FEIS described other noise sources during industrial park operation which might affect people and animals. The proximity of the Lower portion of the proposed site to the Kawainui Marsh could exacerbate the impact of additional noise generated by the proposed development on the environment. Therefore, responsible noise reducing construction and operations would be especially important for the Lower portion of the site.

The following suggested noise abatement measures that could mitigate impacts of noise sources for activities in the Lower portion of the site and reduce the propagation of noise:

- Install vegetated buffer zones berms to reduce the noise that is a normal byproduct of industrial and commercial activities.
- Orient warehouse structures in such a way that direct emission of indoor noise (e.g., through large, rolled gates) is directed away from the areas that are sensitive to noise.
- Promote the use of low noise emitting machinery (e.g., shielding noise sources).
- Promote that all vehicles operating in the park are in good operating condition (e.g., mufflers should work efficiently).

- Install insulation for machinery noise, such as acoustic barriers, noise dissipation walls and vegetative buffer zones in the proposed development. The planned detached loading dock for trucks in the vicinity of the wetland area could be surrounded by sound absorbing vegetation and/or a sound absorbing wall. In addition to noise abatement these measure would also aid in mitigating visual impacts and Lower impacts of avoidance.
- Mandate enforcement of guidelines and procedures to reduce noise levels such as guidelines against unnecessary idling engines. This would also mitigate air quality impacts.
- Locate noise generating commercial and light industrial activities to the interior of the development and away from sensitive areas.
- Prohibit noise generating activities at night or over the weekend.
- Educate tenants in the importance of acting proactively to Lower noise generation and implement noise abatement.

One important differentiator between noises of the two SEIS alternatives is that the SEIS Preferred Alternative would not have a base yard and therefore, **noise levels associated with base yard operations would be avoided under the SEIS Preferred Alternative**. Since noise emitted from base yard operations are typically more severe than noise emitted from warehouse operations, noise impacts under the SEIS Preferred Alternative are expected to be less.

4.8 Impacts on Utility Infrastructure

Section 4.8 of the 2011 FEIS described anticipated impacts of the proposed project on the utility infrastructure that was serving the existing warehouse development at the time the 2011 FEIS was approved.

Under the updated site development plan, the premises of impacts on the utility infrastructure, as outlined under the 2011 FEIS, are still valid. Details of the site development approach have, however, changed to some extent under the updated site development.

One of the basic assumption is that impacts on the utility infrastructure are proportional with the total warehouse space to be added. Here the two SES alternatives differ, since more warehouse space would be added in the Lower site, under the SEIS Preferred Alternative .

4.8.1 Impact on Water Supply

The 2011 FEIS described that the proposed project would increase the amount of water needed for the operation of warehouses. The estimated increase in water use at the site would not necessarily be the same increase in water use on an island-wide level. Tenant surveys conducted after the 2011 FEIS was accepted revealed that most of the commercial and industrial tenants are not engaged in processes that require high water use. There are no food processing tenants, and much of the light industrial activities are concerned with general warehousing. There are, however, some tenants who might use more potable water.

Tenants in the Kapa'a Light Industrial Park typically do not have high water use, and water use generally is limited to typical sinks and related washing. There are no showers installed in the warehouse development. For the design of wastewater facilities, a design water use per occupant of warehouse

space is 20 gallons per day (gpd), while a typical residential water use is about 80 gpd, according to the Honolulu Board of Water Supply. This daily water consumption reflects a significant drop of water use of the past couple of decades.

Since the SEIS Preferred Alternative would have more warehouse space than the SEIS No-Action Alternative water consumption inside the latter warehouses would be less. The SEIS No-Action Alternative would, however, have a base yard, and the water use of the base yard would have to be added to the water consumption in the warehouses.

The 2011 FEIS assumed that about 20 percent of the water use for the entire project site would be for irrigation. For the two SEIS alternatives, the water use for irrigation would approximately the identical. In Section 6.8 of this SEIS document newer assessment of irrigation needs in the Lower were made indicating that irrigation needs for the updated site development plan, thus the conditions associated with the SEIS Preferred Alternative, would be like the SEIS No-Action Alternative. Irrigation needs in the Upper site would be approximately the same under both alternatives.

4.8.2 Impacts on Wastewater Systems

Section 4.8.2 of the 2011 FEIS described the onsite wastewater treatment at the project site. Under the updated site development plan the selection of wastewater treatment technologies and the impacts they cause would change significantly from this described in the 2011 FEIS.

Under the 2011 FEIS, the existing onsite wastewater system was described as multiple conventional septic systems being installed in the Upper portion of the site. Since the Lower site did not have any warehouse developments at that time at the time the 2011 FEIS was approved, no septic systems were installed in the Lower site.

On planning the future wastewater treatment, the 2011 FEIS considered foremost, that the project site, as well as all installations and buildings in the Kapa'a valley, were not connected to the municipal sewer system. There were and still are no plans to connect the Kapa'a Valley to the municipal sewer. Connecting the proposed site to the Kailua sewer system would require the installation of a forced sewer line of about 1.2 miles in length, measured between the Upper portion of the site and the assumed take-over-point of the existing sewer system in Mokapu Boulevard. The expected comparatively low quantity of the wastewater, the long distance of the forced sewer and the required pumping power render a connection of the proposed site to the existing sewer system as not advantageous, both in economic and ecological terms.

The 2011 FEIS concluded that the proposed project would have to rely on the use of onsite wastewater treatment units. In selecting onsite wastewater treatment processes for the new development, the 2011 FEIS concluded that two alternative technologies would be available. These two options were conventional and alternative septic systems. According to the U.S. Environmental Protection Agency (EPA), about 25 percent of households in the U.S. dispose of their wastewater through septic systems. The EPA indicates that septic systems, when adequately installed and operated as decentralized wastewater systems, are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas.

The conventional septic system consists of a two-stage treatment process. The wastewater first flows into a septic tank where solids are separated from the water by settling or by floating in a foamy scum layer at the surface of the water inside the tank. Anaerobic decomposition of organic matter reduces the amount of sludge that accumulates in the tank. The tank must be pumped, e.g., the sludge must be removed from the tank periodically when the storage volume of the tank is reduced by the sludge. The liquid effluent, after initial treatment in the anaerobic septic tank overflows. The effluent typically passing through a filter, and then flows to an underground infiltration field, the so-called leach field. In the leach field aerobic decomposition of the organic matter occurs. The treatment process also includes filtration and absorption processes, as the water percolates into the ground. Figure 4.8.2.1 shows a typical configuration of a septic system, comprised of a septic tank followed by a subsurface infiltration system (e.g., leach field).

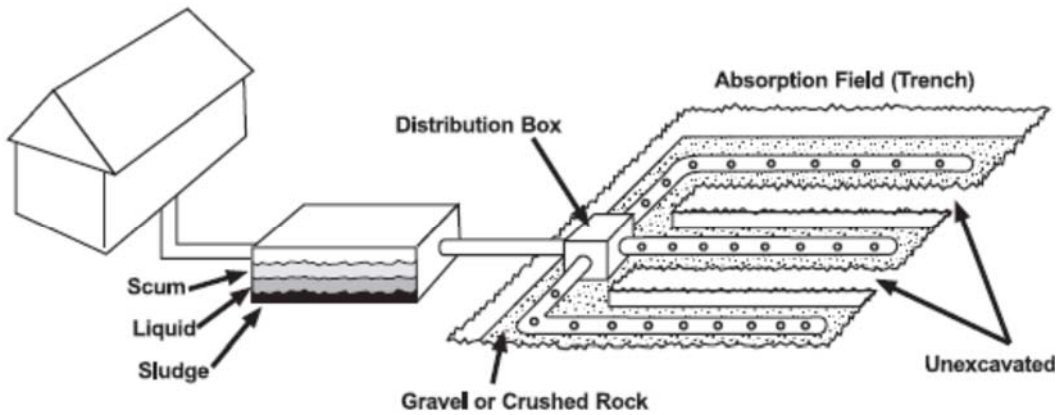


Figure 4.8.2.1: Conventional subsurface wastewater infiltration system (EPA, 2002) (source Figure 4-9 of the 2011 FEIS)

In establishing a well performing septic system, the design of the septic tank system is as important as the design of the infiltration field. The septic tank must avoid leakage of raw sewage due to corrosion, uneven settling, or other failure modes of the tank. Leaking septic tanks can lead to a catastrophic failure of the entire septic system. The failure of the leach fields in conventional septic systems is typically more often the responsible mechanism that determines total or partial failures of onsite treatment and disposal systems of wastewater. A leach field must be designed and sized in conformance with the design flow and organic loading. While the sizing of the leach field based on hydraulic loading rates is typically used to assess the required size of the leach field, the sizing of the field size based on organic load is a more conservative design assumption, since it results in larger leach field dimensions for wastewater with higher biological oxygen demand (BOD) concentrations.

The leach field is an indispensable part of the treatment process in the conventional septic system. Typically, the anaerobic septic tank contributes 40 to 50% of the treatment capacity, and the rest of the treatment occurs in the aerobic soil absorption field (e.g., leach field). In the leach field the septic tank effluent experiences filtration, micro straining, and aerobic biological decomposition processes in the

biomat of the leach field. The septic system, thus the combination of the septic tank and the leach field zone can remove between 80 to 90 % of organic load and suspended solids.

Leach fields can fail in their intended function if the distribution of the effluent is not uniform, the organic loads are too high to stimulate clogging by a proliferating biomat (e.g., bacteria overpopulations) or when the leach field has a tight surface cover, e.g., resulting in insufficient aeration to maintain aerobic treatment processes and to allow water loss through evaporation. If the pollutant concentration of the septic tank is too high for the configuration of the leach field, sewage infiltration and treatment in the field might be insufficient and sewage with too high concentration of pollutants can reach the ground water. Furthermore, if the distance between the bottom of the infiltration field (e.g., the point of injection) and groundwater table is too small, treatment in the wastewater infiltration field does not occur in saturated (e.g., saturated or flooded with water) soil conditions and therefore the treatment capacity of the leach field is compromised.

At locations close to important surface or groundwater resources, the effectiveness of conventional onsite sewage systems might not be sufficient to treat and dispose of wastewater enough to effectively mitigate all adverse impacts. Similarly, if the water table is too high, septic systems do not work properly since there might not be sufficient unsaturated soil below the soil absorption field.

The 2011 FEIS concluded that both of the above conditions apply for the Lower portion of the project site and therefore a type of wastewater treatment is required that goes beyond conventional septic systems. Onsite wastewater treatment systems in the Lower portion of the proposed site would be closer to surface and ground water than such systems in the Upper portion of the site. The infiltration points of leach fields in the Lower portion of the site would have short vertical and horizontal distances to travel, and there would be a probability of insufficiently treated wastewater reaching the ground water table and/or seeping into the Kapa'a Stream corridor or drainage ditch.

The Upper portion of the site, on the other hand, had significant vertical distances between infiltration points and water resources, e.g., the underground path of the injected wastewater is longer, and renders more time for effective removal of pollutants until the effluent reaches the groundwater table to seep out into the stream corridor and enter the wetland or Kapa'a stream.

While conventional septic systems as onsite wastewater systems typically can achieve reasonable removal rates of biological oxygen demand (BOD), total suspended solid (TSS) and pathogens, most conventional septic systems have a limited capacity to reduce the organic load to such low concentration as is required for larger treatment facilities, Additionally, conventional septic systems typically have a limited capacity to reduce nutrients. The conventional process of removal of nitrogen requires anaerobic process conditions for effective denitrification.

In cases where higher removal rates of nutrients are required, such as in the Lower portion of the project, alternatives to conventional system are required. The 2011 FEIS concluded that for the Lower site, an alternative wastewater system should be used which has a high removal capacity for organic, TSS and nutrients.

The 2011 FEIS proposed the recirculating sand filter treatment technology as a suitable alternative to conventional septic systems in the Lower site. The recirculating sand filter includes aerobic (recirculating) sand filter, anaerobic recirculation pump chamber and subsurface infiltration field. Aerobic treatment and the removal of organic load occurs in the aerobic sand filter. After passing through the sand filter the wastewater flows back to the recirculating pump chamber, which is anaerobic and provide suitable process conditions for denitrification, e.g., the removal of nitrogen as the most prominent nutrient in the wastewater. The excess effluent is then pumped to soil absorption fields where the effluent infiltrates into the soil.

What made the recirculating sand filter a good candidate as an alternative way of treating wastewater was the low residual pollution of the treated effluent and the low operational costs. The 2011 FEIS described average pollution reduction rates for the recirculating sand filter as 95% of BOD, 98% of TSS and 60% of Total Nitrogen. These rates compared favorably against recommended value promulgated by the EPA for receiving water such as the wetland areas adjacent to the Lower site.

The EPA recommendations reported in the 2011 FEIS were as follows:

Assumed water resource value:	Surface water resource which is nutrient sensitive, such as lakes, ponds, rivers, wetlands etc. where surface water are sensitive to eutrophication or loss of shellfish or finfish nursery area due to nutrient input
Vulnerability rating:	High
Vertical separation distance between point of release and water table or impermeable soil layer:	1 – 3 feet (it must be considered that the total depth of the infiltration field is in the order of 4 to 6 feet below surface). The considered range of 1-3 feet is a conservative estimate.

Proposed onsite system treatment performance standards for Lower portions of proposed site:

BOD (mg/L)	: <= 10
TSS (mg/L)	: <= 10
Total N (% removed)	: >=50%

Figure 4.8.2.1 shows the basic flow and process diagram which compares conventional septic system to the recirculating system. The flow system depicted in Figure 4.8.2.1 is using a so-called STEP system, Septic Tank Effluent Pump system approach, where the wastewater first enters a conventional septic tank for primary treatment. The effluent of the septic tank is then pumped to the advanced treatment in the recirculating sand filter. The resulting system is elaborate but provides results which are suitable in accordance with the above EPA recommendations.

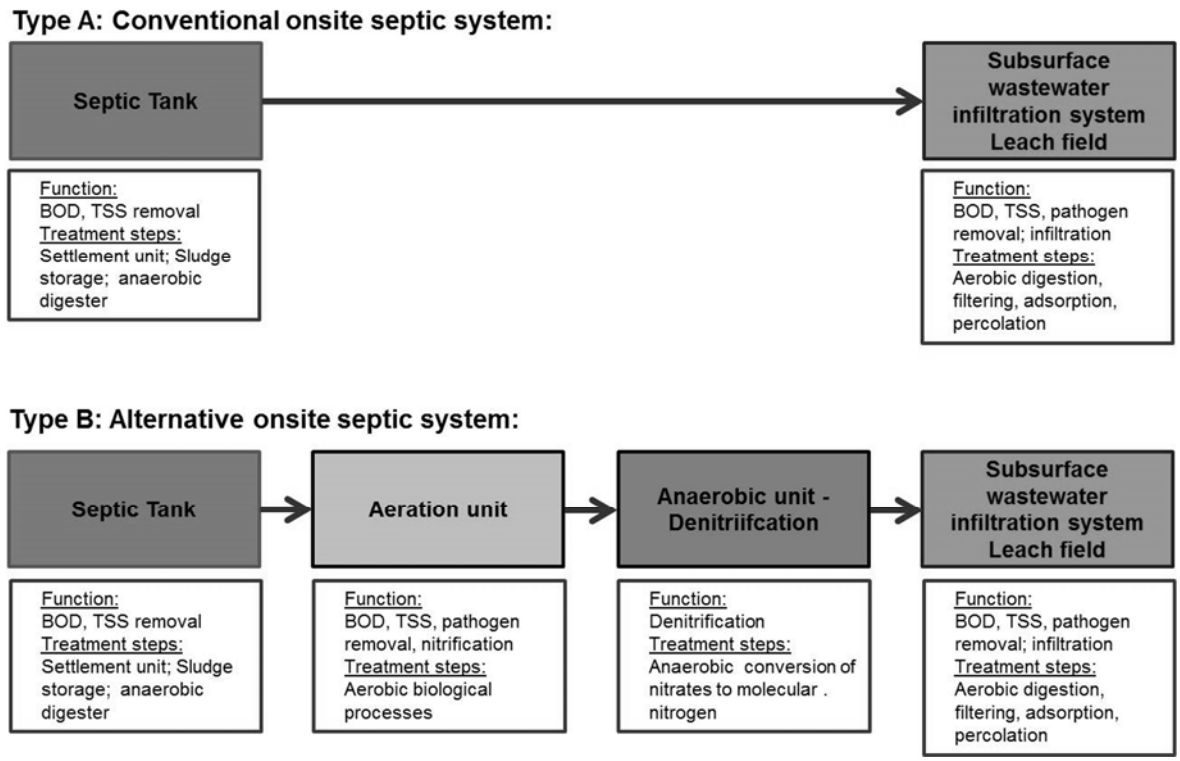


Figure 4.8.2.1: Comparison between candidate alternative septic systems and conventional septic systems (source Figure 4-10 on the 2011 FEIS)

For the Upper portion of the site, the 2011 FEIS assumed that conventional septic systems would be sufficient, since the vertical distance between point of release and saturated soil layers is in the range of at least 10 to 15 feet and the point of release is further separated from the wetland areas in the Kapa'a stream corridor and the Kawainui Marsh. This substantial vertical and horizontal distance between point of release of effluent at the leach fields in the Upper portion of the project site and sensitive water resources would provide a wide enough safety envelope for the use of conventional septic systems.

Under the SEIS Preferred Alternative, and thus under the updated site development plan, the EPA recommendations for advanced onsite wastewater treatment were followed in selecting the preferred onsite wastewater technology. The selected treatment technology for the new development is the membrane bioreactor (MBR) technology. This MBR technology has high treatment efficacy for organic load (BOD), TSS and nutrients, which surpass the performance of the recirculating sand filter.

Under the SEIS No-Action Alternative, the recirculating sand filter, or equivalent, would be used in the Lower site and conventional septic system would be used in the Upper site.

In the MBR technology, all treatment occurs in the first and only process vessel. Raw wastewater enters the MBR process vessel in a settling chamber, which is like a septic tank, where part of the treatment occurs. The overflow from the settling tank flows into the process chamber where aeration occurs with activated sludge. Effluent is extracted from the process chamber by means of a low flow extraction pump that forces the effluent through a membrane for final disposal. Higher denitrification performance of the MBR system is achieved by using a 3-chamber configuration where a part of the process chamber

is held anaerobic, thus providing favorable process conditions for extended denitrification. The effluent from the MBR process vessel either flows to a soil absorption field directly downstream of process vessel or is pumped to a field at a distance.

Under the SEIS Preferred Alternative several MBR process vessels will be located within the Lower site and their effluent will be pumped to a location that has a higher elevation, to ensure sufficient distance to the ground water below the bottom of the soil absorption.

The specific MBR technology that will be used is one of the first to obtain certification under the new National Sanitation Foundation (NSF) standard 350. The NSF 3590 standard was developed to exemplary onsite wastewater treatment with the goal of producing a treated effluent that can be used as recycled led water. The basic aim of the new NSF 350 standard is to produce treated effluent that resembles storm water and thus can be used as a resource at the project site.

While under the updated site development plan, the focus for the use of advanced wastewater treatment is the Lower portion of the project site, advanced wastewater technology will also be used in the Upper portion of the site. At the present, the Applicants are conducting a pilot installation of the first two MBR process vessels in the Upper portion of the site. The pilot project is being conducted with the endorsement by the Hawaii State Department of Health (DoH).

Upon satisfactory completion of the pilot project, the Applicants plan to equip all new developments with the MBR technology, in the Upper and the Lower portions of the project site. This move will significantly improve the quality of the onsite wastewater treatment at the project site. Section 6.10 of this Draft SEIS document describes the proposed MBR technology.

It should be noted that the onsite wastewater pilot project does not examine the efficacy of the advanced MBR wastewater treatment, which has been widely tested. The main objective of the pilot project is to test the infiltration characteristics of the treated effluent, and if the smaller infiltration field sizes can successfully dispose of the treated wastewater effluent.

Summarizing, the selection of the MBR technology represents a significant effort to improve the onsite wastewater treatment at the project site. Having effluent that basically resembles water quality of storm water opens new opportunities to use the onsite treated wastewater as a valuable resource.

4.8.3 Impact on Telecommunications

Section 4.8.3 of the 2011 FEIS describes that the Proposed Action alternatives would increase the demand for telecommunication services at the proposed site. Under both the SEIS Preferred Alternative and the SEIS No-Action Alternative these assumptions are still valid, and there is no significant change from the 2011 FEIS.

The 2011 FEIS described that some new infrastructure would be required in some parts of the Upper portion of the site, and within the entire Lower portion of the site. Installing these improvements on the site would not likely result in a significant impact. At the time, the 2011 FEIS was approved, the telephone service to the Kapa'a Valley was provided by an above-ground telephone line that runs along Kapa'a Quarry Road towards Mokapu Blvd. It was expected that the existing line would have sufficient

capacity for the expansion of services. If required, new conduits could be installed at the utility pole to increase capacity. This installation is not expected to pose significant problems or impacts.

4.8.4 Impacts on Electricity Supply

Section 4.8.3 of the 2011 FEIS described that the Proposed Action would increase the current electric demand and energy consumption as more industrial space is added. Under the 2011 FEIS it was expected that the existing power system was able to handle the load increase in the Upper portion of the site. For the Lower portion of the site an entire new distribution system would be required.

Under the SEIS Preferred Alternative, more load demand would occur in the Lower site than under the SEIS No-Action Alternative since more warehouse space would be added in the Lower site. The 2011 FEIS projected an increase in electricity demand and annual electric energy consumption of about 150 percent relative to the demand and usage at the time the 2011 FEIS was approved. The 150% increase reflected the conditions of development density that would also be used under the SEIS Preferred Alternative.

Both SEIS alternatives would implement energy savings through energy conservation and the installation of renewable energies. The Applicant has the intention of adding a significant amount of photovoltaic (PV) capacity to the warehouse development. In essence the goal would be to make the warehouse development a Net-zero development, with generating the same amount of electric energy as is consumed. There are approximately 650 kW of PV installed at Upper site. An expansion of the PV capacity would require the consent of HECO and other permitting agencies.

A change in the electricity supply to the project site will be planned, relocating of some section of power lines that supply the Kapa'a Valley. The existing electricity supply occurs through a 4.16 kV transmission line from Mokapu Boulevard. Since the power lines passes through the Lower site a 2,000-foot section of the power line must be replaced to run outside of the site development boundaries of the Lower site. Communication with Hawaii Electric Company (HECO) indicates that the project of rerouting the power lines would also include conversion to a newer power transmission technology, which would solve the supply condition for the expansion of the Kapa'a Light Industrial park under the updated site development plan.

Appendix L describes alternative alignments of the rerouted power lines which supply the project site and expected impacts on the environment and community.

4.8.5 Impacts on Solid Waste Disposal and Mitigation

Section 4.8.5 of the 2011 FEIS described that the project site was not served by the municipal solid waste service, but that the Applicants had contracted a private company for the solid waste disposal at the project site. Waste receptacles is collected periodically (e.g., weekly), and the solid waste is disposed of at an offsite landfill. The contractual terms with the waste management company ensures that the waste is disposed of in an environmentally responsible way and in accordance with local codes and standards.

Under both SEIS alternatives, the solid waste disposal would continue as described in the 2011 FEIS.

A comprehensive recycling program would still be implemented for the Lower portion of the site, in accordance with the sustainable design approach and LEED certification requirements. There would be several easily accessible dedicated areas for the collection and storage of the recycled materials. Recyclable materials would include, at a minimum, paper, corrugated cardboard, glass, plastic, and metals. The separate collection of bottles and aluminum cans which carry a refundable deposit would be provided in each building. While the comprehensive recycling effort would be organized and verified only for the Lower portion of the site, collection and storage of recyclable material would also be offered in the Upper portion of the site, to take advantage of synergy and increase the volume of recyclable material for the waste management company.

Littering and non-conforming disposal of waste could result in a range of impacts, from simple annoyance to direct adverse impact. Waste that is improperly disposed of or abandoned can result in the release of hazardous agents that can directly impact the environment, human beings, or wildlife, or could accumulate in terrestrial or aquatic soil and could pose a long-term threat when released, due to elevated concentration.

Littering and non-conforming disposal of waste will be mitigated during the construction and operation of the Kapa'a Light Industrial Park. The presence of ample waste receptacles and the education of tenants and their employees to refrain from any littering and assist in the avoidance would be effective mitigation measures.

In addition, the management of the industrial park would safeguard that no waste would be disposed of in a non-conforming and environmentally harmful way. The propagation of waste into the adjacent wetland areas and the Kapa'a Stream corridor would be mitigated by the fence at the perimeter fence of the property. Periodic survey and controls of the perimeter of the development footprint would also assist in maintaining the proper appearance of the proposed development and reduce the chance that wildlife and plant life are adversely affect by inappropriate waste disposal.

4.9 Impacts on Traffic and Mitigation

Section 4.9 of the 2011 FEIS described impacts of increase traffic on roadway sections that were adjacent to project site and on three intersections which would be affected by the Proposed Action. The 2011 FEIS used three roadway sections that were adjacent to the project site and three intersections that were affect by traffic associated with the project site. Tables 4.9.1 and 4.9.2 show the three adjacent roadway sections and the three intersections.

Figure 4.9.1 illustrates the locations of the roadway sections adjacent to the project site, 1 through 3, and the three intersections, A though C, referred to in Table 4.9.1 and 4.9.2.

Table 4.9.1: Three roadway section adjacent to the project site (Source Table 4-7 of the 2011 FEIS)

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

Table 4.9.2: Three intersections which are affected by the project site (Source Table 4-78 of the 2011 FEIS)

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

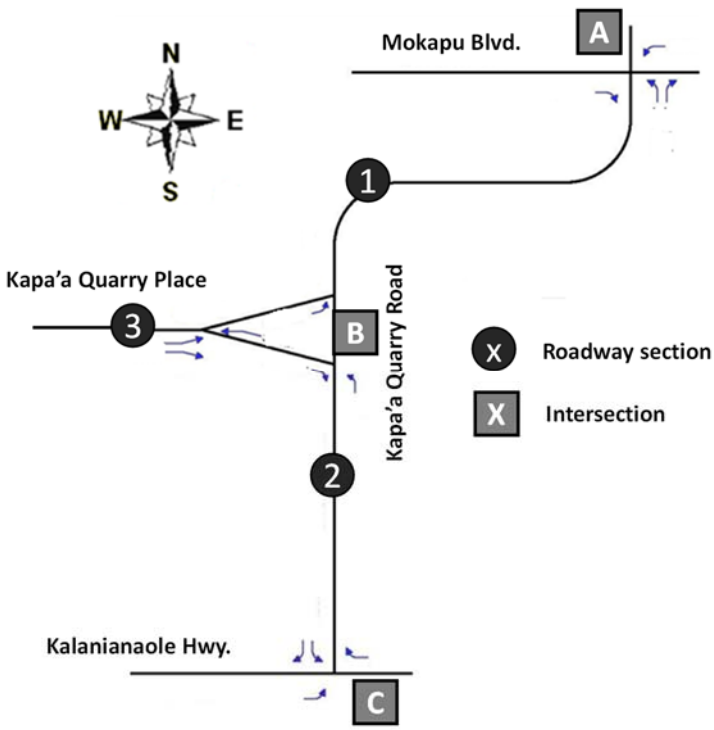


Figure 4.9.1: Locations of the roadway sections adjacent to the project site, 1 through 3, and the three intersections, A though C.

The 2011 FEIS used a Traffic Impact Analysis Report (TIAR) to assess the levels of service on the three adjacent roadways and the three intersections. The TIAR was conducted during an early phase of the environmental review.

Since the development of the project site predicted ongoing and new site developments pending at the time the 2011 FEIS was approved, the decision was made that an updated TIAR would have to be performed at a later time in the project. Specifically, the State Department of Transportation (DoT) review of the TIAR had indicated areas of analysis that should be reevaluated. The DoT assessment was that the LOS values reported in the current TIAR might be too optimistic. Specifically, the DoT stated that the re-analysis of LOS at the two intersections under state jurisdiction (e.g., the intersections of the Quarry Road with Kalanianaole Hwy. and Mokapu Blvd.) using additional traffic analysis parameters and a reassessment of the anticipated traffic growth in the region was warranted. If the reevaluation would determine LOS levels that are were significantly higher (e.g., less favorable) than in the referenced TIAR, the traffic improvement recommendations might have to be revised.

4.9.1 Expected Impacts from Background Traffic

The 2011 FEIS described the selected growth rate of the background traffic over the development schedule of the proposed project, e.g., from the time the 2011 FEIS was approved to the expected time of completion of the project development. As stated, before in this Draft SEIS document, the site development of the Proposed Action is being phased in at a slower schedule.

The 2011 FEIS predicted the growth of the background traffic and the expected resulting LOS on the three roadway sections and three intersections. These 2011 FEIS predictions are presented in Table 4.9.1.1 The results indicated the expected level of service (LOS) for the background traffic volume at the three intersections and three roadway segments that are considered for the analysis. The results of the projection of the background traffic suggested that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of C or better. By the year 2026, or at the completion of the proposed project it is expected that traffic impact mitigation would be required for the intersection of Kapa'a Quarry Road and Mokapu Blvd. Possible mitigation measures are discussed later in this section. As stated, before in this Draft SEIS document, the site development of the Proposed Action is being phased in at a slower pace than projected in the 2011FEIS. Therefore, the traffic projections are not applicable at this time and a new TIAR should be completed once the updated site development plan is approved.

4.9.2 Projected Trip Generation and Project Generated Traffic Volume

Section 4.9.2 of the 2011 FEIS described the method of trip generation that was used for the TIAR that was referred to in the 2011 FEIS.

For the warehouse development at the time the FEIS was approved, a traffic count was conducted that determined the movement in and out of the project site for the AM and PM peak periods. The identified traffic movements were than normalized to a trip rate per 1,000 square feet of space in the existing warehouse development. The resulting existing trip generation rates per 1,000 sq. ft. for the AM and PM peaks were calculated as 0.87 and 0.84, respectively. A comparison with the standard trip generation

rates for warehouses under the Institute for Transportation Engineers (ITE) Trip Generation Manual (ITE, 2003) suggested that the existing trip generation rates are Lower than the ITE AM and PM peak standard trip generation rates of 0.92 and 0.98, respectively. Since it was assumed that the occupancy type of the proposed industrial development at full build-out would be the same as at the time of the traffic assessment, the existing trip generation rates at the project site were used for the subsequent analysis.

Table 4.9.1.1: Expected LOS for background traffic based on expects project completion (source Table 4-10 of the 2011 FIES).

Intersection / roadway segments	signalized / unsignalized	backgorund traffic w/o proposed project 2016		backgorund traffic w/o proposed project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	C	C	C	F
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	C	B	C	D
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	B	B	B	B
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	C	C	C	C
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	B	B	C	C
Kapa'a Quarry Access Road	N/A	B	B	B	B

LOS level requires mitigation as unsatisfactory taffic conditions occur

The 2011 FEIS described that the Northern segment of Kapa'a Quarry Road, section, (1) in Figure 4.9.1. and the portion of the quarry road between Mokapu Blvd. and the quarry access road intersection, would experience more traffic volume than the southern roadway section (2) in Figure 4.9.1. The identified asymmetric distribution of the trips between northbound and southbound traffic on the quarry road would suggest that northern portion of the quarry road would cause the larger proportion of traffic impacts.

4.9.3 Expected Future Traffic Volumes and Impacts

The 2011 FEIS described the future traffic volumes by adding the project related traffic (e.g., from the trip generation analysis) to the projected background traffic volumes for the different phases of the proposed project. Table 4.9.3.1 shows the expected level of service (LOS) for the project's future traffic volume at the three intersections and three roadway segments. Based on the results, the 2011 FEIS suggested that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of D or better. Under urban

area traffic conditions, which apply for the proposed site, mitigation measures are required when intersections and roadways are operating at LOS levels Lower than D, e.g., at LOS E or F. For the traffic conditions in 2026, which implied the time of project full build-out, LOS levels were expected for all three intersections that would be above a LOS level of D. **This findings in the 2011 FEIS therefore suggested that traffic mitigation measures would be required at the time the project reaches full build-out.**

As pointed out before in this SEIS document, the SEIS Preferred Alternative would reflect the same future traffic volumes as the conditions presented in the 2011 FEIS since the SEIS Preferred Alternative would have the same full build-out warehouse space as presented in the 2011 FEIS. The SEIS No-Action Alternative would have somewhat smaller future traffic prediction since the total warehouse space would be smaller than the SEIS Preferred Alternative.

Table 4.9.3.1: Expected LOS for background traffic plus project related traffic (source Table 4-12 of the 2011 FEIS)

Intersection / roadway segments	signalized / unsignalized	Future traffic volumes background + project 2016		Future traffic volumes background + project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	C	D	C	F
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	B	B	E	D
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	C	C	D	E
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	C	C	D	C
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	C	C	C	C
Kapa'a Quarry Access Road	N/A	C	C	C	C

LOS level requires mitigation as unsatisfactory taffic conditions occur

4.9.4 Expected Traffic Conditions at Proposed Project Roadway Entrances

Section 4.9.4 of the 2011 FEIS described traffic conditions at three main roadway entrances based on the referred to TIAR. The result of the assessment suggested that all three roadway entrances would operate at LOS levels of C or better, and therefore traffic conditions would be satisfactory. In addition,

sight distance analyses were conducted for the three roadway accesses. Findings suggested that all sight distances for right-turn and left-turn maneuvers at the three roadway accesses were adequate and there would be no adverse traffic impacts due to insufficient sight distances.

The planned roadway accesses to the project site described under the 2011 FEIS were subsequently changed, and two permanent roadway accesses were added, one road entrance for the Upper and one for the Lower sites.

This total of five-access scenarios would remain under the SEIS No-Action Alternative. Under the SEIS Preferred Alternative, one roadway access for the Lower portion of the project site would be removed from the site development plan, and therefore a total of four would remain.

The proposed single roadway access to the Lower site is described in Section 6.9 of this SEIS document. This single roadway access scenario to the Lower site reflects the SEIS Preferred Alternative. Section 6.9 presents a sight distance analysis for the single to the Lower site. The results indicate that adequate sight distance is available for this roadway access.

4.9.5 Traffic Impact Mitigation Measures

Section 4.9.4 of the 2011 FEIS describes that the traffic conditions in the year 2016 would not warrant mitigation measures since all intersections and roadway segments that would be affected by the proposed project would be operating at LOS levels equal or better than D. LOS D is the lowest LOS level that does not automatically carry the requirements of mitigation.

The expected traffic conditions in the year 2026, which represented the completion of the development in the Lower portion of the project site and the full build-out of the proposed industrial park, would require mitigation measures, since the three intersections would operate at a LOS levels Lower than D.

The 2011 FEIS suggested that an updated TIAR, reflecting the newest development plans, should be conducted to select the most appropriate traffic impact mitigation.

4.9.6 Consideration of Impacts from Heavy Vehicle Traffic

Section 4.9.6 of the 2011 FEIS described the expected increase in heavy vehicle traffic on the Kapa'a Quarry Road. The percentage of heavy vehicle of total traffic was assessed for the existing traffic conditions at the time the 2011 FEIS was approved. As stated earlier, there is no updated TIAR available at this time and therefore the conditions described in the 2011 FEIS serve as indicators of expected traffic impact from heavy vehicles.

In the 2011 FEIS, the assessment of the expected increase of heavy vehicle traffic on the quarry road was done at two locations, for both the AM and the PM peak. The traffic levels on the southbound and northbound traffic were added to give the total, bidirectional traffic volume as the representative traffic volume. The locations "A" and "B" are defined in Figure 4.9.6.1, where "A" represents the northern segment of Kapa'a Quarry Road, between the intersections with the quarry access road and Mokapu Blvd and "B" represents the southern road segment between the quarry access and Kalanianaole Hwy.

The results for the assessment of impacts due to heavy vehicles indicated that such traffic volume would grow most on the Northern segment of the Kapa'a Quarry Road, represented by (A) in Figure 4.9.6.1. It was therefore expected that the northern segment of the quarry road would experience most of the possible impacts of heavy vehicle traffic. A comparison of the project related rates of increase between total traffic and heavy vehicle traffic suggests a 36 percent increase in total traffic volume versus 70 percent increase in heavy vehicle traffic. Therefore, the traffic impact assessment suggested that the heavy vehicle traffic generated by the project would result in a twice as large increase in traffic volume than that of the total traffic.

The 2011 FEIS conclusions were that it was beneficial to validate these projections in a new TIAR to be conducted later in the project. A later TIAR would be helpful to plan mitigation measures with a better understanding of the actually occurring increases in heavy vehicle traffic volumes.

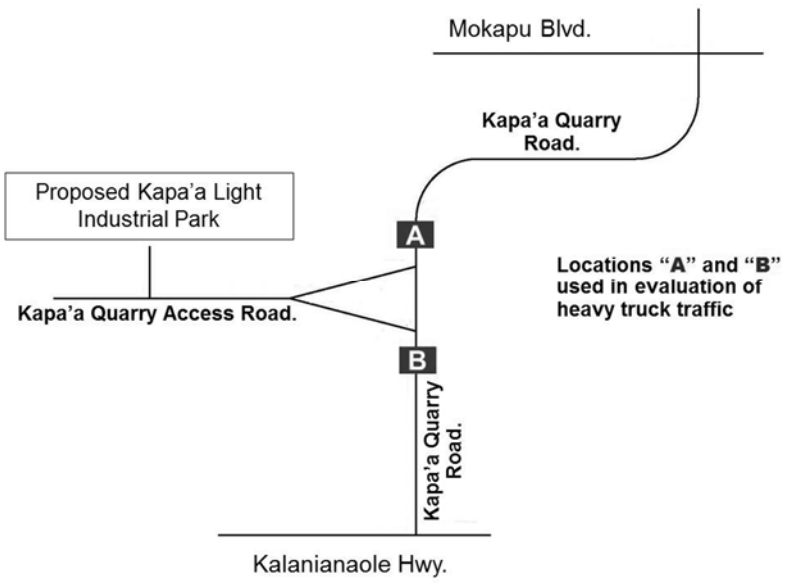


Figure 4.9.6.1: Location of point A and B for heavy truck impact evaluation

The 2011 FEIS suggested that the increase in heavy vehicle traffic could adversely affect the environment and the community, such as through traffic congestion, increase in noise and air pollution, increased highway maintenance costs, increase or wildlife collisions, and other safety issues. The 2011 FEIS described some of the potential impacts as following:

<u>Impacts due to weight:</u> Heavy vehicles contribute more to roadway damage than light vehicles. There is a correlation between weight of trucks and buses and the amount of anticipated damage to bridges and roadway pavement. Hawaii limits the maximum weight and length of heavy vehicles to 65 feet for truck-tractors and semi-trailers and 80,000 pounds for any vehicle that operates or moves on any public road, street, or highway within the state. But the weight of trucks on certain roads could be limited to significantly Lower allowable weights, especially on roads that were built decades ago and have bridges that cannot accommodate modern day heavy vehicles. While road damages generally increase with heavier vehicles the individual axial weight is also important to consider.

Trends that favor larger and heavier trucks might reduce the number of trips and lower the axial loads since these larger vehicles usually distribute the weigh on more axles, thereby reducing the impacts to roadway pavements.

Impacts due to noise: Noise impacts from heavy vehicles result from two main parameters, the traffic stream, and the individual noise from the heavy vehicle.

Noise levels resulting from the traffic stream increases with vehicle speed of individual vehicles on the road. The increase of noise with the vehicle speed follows a function that is specific for the type of vehicles. As an approximation, Figure 4.9.6.2 suggests a comparison between the typical generated noise by smaller cars and by heavy vehicles with three of more axles traveling at the same speed.

As Figure 4.9.6.2 suggests, the noise level emitted by heavy vehicles is significantly higher than for cars, therefore a reduction in speed related noise is more readily accomplished with cars than with heavy vehicles. Reducing actual driving speed can result in significant noise reduction. Enforcing speed limits can be a challenge and typically requires the buy-in of drivers. Enforcing speed limits through simple static signs is most often not effective; but controls as well as dynamic variable signs and those informing drivers of their speed can result in significant speed reduction and noise mitigation. As a rule of thumb, doubling or halving traffic volume results in noise changes of about 3 dBA, which is the level of noise change discernible to the human ear.

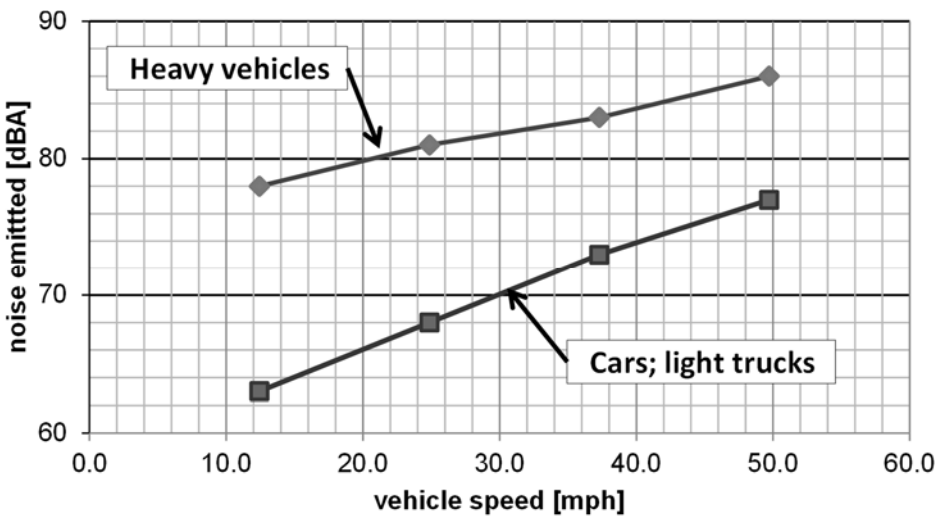


Figure 4.9.6.2: Comparison between typical speed dependent noise level generated by cars and heavy vehicles

Noise resulting from the operation of an individual heavy vehicle can be strongly attributed to the driving patterns of the operator. The noise emitted from the vehicle is a strong function of the rpm of the engine. Driving the vehicle in low gear can contribute to higher noises. Furthermore, frequent deceleration and acceleration can result in higher noises than for vehicles traveling at a constant speed. Avoidable noise is generated from idling large engines unnecessarily and there are recent laws and ordinances forbidding unnecessary engine idling. Another source of noise in the operation

of heavy vehicles is pneumatic brakes, which suggests that heavy vehicles driving at a constant speed can reduce noise levels.

Safety issues: Accidents involving heavy vehicles are always risky due to the large kinetic energy coming to an abrupt halt or deflecting on other vehicles. As rule of thumb, human error is the biggest contributor to accidents, not size or weight of the vehicle. For about two thirds of accidents involving heavy vehicles, the drivers of light vehicles are "at fault". Operators of heavy vehicles are professionals who know the capacity and limits of their vehicles often better than operators of private cars. The most common contributors to driver impairment in heavy vehicle are fatigue, drug taking (including drinking) and medical conditions.

The most effective mitigation of accidents involving heavy vehicles is a more effective general road safety deterrence, which includes regulating traffic issues on the roads that are most responsible for unsafe mixing of significant traffic volume of heavy vehicles, cars, light trucks, and motorcycles. Beside human error, ineffective roadways can contribute to a less than desirable safety situation on the roads, such as reduced lane width, sharp curves, insufficient visibility, high speed limits and missing visual indicators, to name a few. Mitigation could include such measures as clearance of roadside hazards or use of barriers to reduce such hazards, improvement and widening of shoulders, audible edge lining, night-time delineation, passing lanes (where appropriate), and replacement of intersections by roundabouts.

Wildlife collisions: Impacts of significance for the project site are possible wildlife collisions, due to the proximity to the marsh. Avoidance is easier and potentially safer for a car than for a heavy vehicle, given the mass of a heavy vehicle. Elevated speed is a major contributor to wildlife collisions since reaction time and avoidance maneuvers are more difficult at higher speeds. The frequency of wildlife collisions is further dependent on the time of day, with night contributing most of the collisions since wildlife is more active at night and can be blinded by headlights of approaching vehicles. Since heavy vehicle traffic resulting from the proposed project would be almost exclusively during the daytime there would be a significant reduction in related impacts. Studies have shown that informative dynamic signs, such as "*drive slowly to protect our wildlife*" or *"# of birds were killed last year on this road; drive with caution*" are more effective in promoting better and slower driving than static signs. Considering such dynamic signs for the quarry road and in the vicinity of the marsh might have a positive effect on the reduction of animals killed on the road.

Impacts on air quality: Heavy-duty diesel engines of trucks and buses release unburned hydrocarbons, carbon monoxide (CO), sulfur oxides, nitrogen oxides (NOx), particulate matter, and other toxic compounds. While the emission of hydrocarbon emissions and carbon monoxide from heavy vehicles represent only a small fraction of the overall traffic related emission of these agents, heavy vehicles contribute significant amounts of NOx and particulates. NOx and particulate matter both contribute to public health problems in the United States. NOx emissions from diesel vehicles play a major role in ground-level ozone formation. Ground-level ozone, more commonly known as "smog," is a respiratory irritant that is most problematic in the summer months. It causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. Diesel particulate matter (soot) is a fine particulate matter that is easily inhaled and deposited deep in the

lungs and is a probable human carcinogen. Particulate matter can be linked to increased respiratory symptoms and disease. Children and the elderly are most at risk of ozone and particulates. In addition, ozone , NOx, and particulate matter can adversely affect the environment through damage to vegetation, impacts to the aquatic environment and visibility impairment.

Harmful emission levels from heavy vehicles are a function of the weight and size, and therefore of the engine power of the vehicles, and naturally more vehicles with more powerful engines emit more. What seems to be a more important determinant, however, are the ages and the state of operational readiness of the vehicles. Stricter standards for new trucks, originating back some 20 years and having become applicable standards recently, have resulted in significant reductions of emissions, and have Lowered the emission of heavy diesel-powered vehicles by more than 90% under those of vehicles built only 30 years ago. Emissions reductions can be achieved using pollution control devices (e.g., catalytic converters) and low sulfur diesel content, which has reduced the sulfur content of road diesel from 500 ppm to 15 ppm. The overall clean air impacts of these rules have contributed to a significant reduction in emissions from diesel operated heavy vehicles.

Excess smoke generation indicates diesel engines require maintenance and dark smoke is a sign of insufficient combustion, resulting in wasting fuel and producing excess emissions. From the public's perspective, smoking trucks symbolize significant health concerns which need to be mitigated. Suitable mitigation efforts include promoting regular tune-ups and maintenance. Enforcement to reduce excess smoke can use tests to determine the opacity of smoke being emitted from the exhaust pipe. An engine that is not emitting any smoke or emits little smoke is probably operating efficiently and will pass the opacity test.

The 2011 FEIS suggested the following generic mitigation measures to limit impacts from heavy vehicle traffic. While these mitigation measures will help to significantly Lower traffic impact, heavy truck traffic is a special case that would require extensive and comprehensive mitigation measures to reduce impacts to below significant levels.

a. Increasing the safety on the quarry road by enforcing or promoting the speed limit, experience has shown that static signs are not as effective as dynamic signs and active enforcing the speed limit.
b. Clearance of roadside hazards or installation barriers to reduce such hazards, as an example a roadside hazard is the present state of the drainage canal directly adjacent to the quarry road and a missing shoulder separating the road from the canal, over sections of the road.
c. Improvement and widening of shoulders, possibly also implementing a shared bicycle or sidewalk at sections of the quarry road.
d. Audible edge lining and night-time delineation to increase traffic safety during nighttime. Streetlamps are not installed along the quarry road and therefore nighttime visibility remains difficult. However, streetlights would add to light pollution along the marsh and might not be advisable.
e. Passing, acceleration or deceleration lanes (where appropriate) to allow a more effective merging of the heavy vehicles into the quarry road. As have been shown in the TIAR, the AM peak left turn from the quarry access road would require mitigation before planned completion of the proposed industrial park, die to unacceptable level of service (LOS).

f. Noise impacts mitigation by avoiding an unsteady traffic flow with frequent decelerations and accelerations. Noise reductions can also be achieved by such measures as Lowering the speed on the quarry road, improving the pavement quality, and installing noise barriers, e.g., a tree line at the Mauka side of the quarry road (this would also help in reducing the visual impact and the probability of wildlife collisions.
g. Air impact mitigation is best achieved by promoting the use of newer heavy vehicles in the proposed development and by promoting avoidance of unnecessary idling, strong acceleration, and decelerations. The operator of the proposed industrial park could identify inefficient vehicles driving in the development by the amount of excess dark smoke and require maintenance and engine tune-ups as a condition to operate in the industrial development.

Since the 2011 FEIS was approved, the Applicants commissioned a traffic safety study. The study was performed to investigate the need and feasibility of possible safety improvement on the Kapa'a Quarry Road. The findings of the traffic engineering study suggested, among other improvement measures, improved clearances on the roadway shoulders to improve sight distance and to remove larger objects to avoid collisions.

In response to the scoping for this SEIS document, the State Department of Transportation suggested that traffic impact mitigation measure needed to be designed and implement before full build-out of the project is achieved.

4.9.7 Off-street Parking

Section 4.9.7 of the FEIS described that parking would be exclusively on-site and public roads would not be used for parking by employees and visitors of the proposed industrial park. Therefore, there would be no adverse impacts on roadway parking. Both alternatives would provide sufficient parking and loading space in accordance with county land use ordinances. Under both SEIS alternatives parking spaces close to entrances would be preferably offered to drivers of low emitting vehicles and car- and vanpools.

The provisions for parking described under the 2011 FEIS would still be followed under the two SEIS alternatives.

Appendix F of this FSEIS describes the County off-street parking rules which will be followed in the site development. Appendix F also describes the configuration of trees which will be added in accordance with these rules. The County rules for adding tress to parking areas suggest using the tree wells also as a LID storm water treatment BMP, which typically promotes significant infiltration of runoff. Since infiltration of runoff as a storm water BMP cannot be used at the project site, the trees will have curbs to avoid runoff from adjacent traffic areas running into the tree wells. The trees will instead be irrigated with harvested rainwater. The proposed design concept of the trees planted in engineered soil is described in Appendix F.

4.9.8 Public Transportation

Section 4.9.8. of the 2011 FEIS described that the proposed site was not served by public transportation and no plans have been identified by public transportation authorities to start serving the proposed site in the foreseeable future. This conditions are still valid under the updated site development plan.

In Section 3 of this Draft SEIS document it was described that the nearest bus stop is at the Kalanianaole Highway. Employees and visitors who wish to walk to the project site find it hard and possibly unsafe to walk along the Kapa'a Quarry Road due to missing or insufficient shoulders and completely missing sidewalks.

In the 2011 FEIS, the Applicants raised the possibility of implementing a private shuttle that would connect the project site with parts of Kailua or Kaneohe or with the nearest public transportation service locations. The implementation of a private shuttle was not committed to in the sustainable design approach and no credit points under the LEED sustainable site credit categories are attempted at this point. The implementation of a shuttle service would be contingent on the identified need for employees and visitors of the development. Connecting the proposed site to the public transportation system would be a positive step in promoting the low impacts development goals of the proposed development.

4.9.9 Alternative Modes of Transportation

Section 4.9.9 of the 2011 FEIS describes alternative modes of transportation to reach the project site. The goal of alternative mode of transportation is a reduction of individual car uses and the related impacts on air emissions. Under the updated site development plan the basic premise of the alternative modes of transportation described in the 2011 FEIS is still valid. Plans of a walkway or bike way to connect the project site with the regional road system have not been realized in the time since the 2011 FEIS was approved.

The possible private shuttle service if no public transportation service to the proposed site, as described in the 2011 FEIS, is still a possibility at full build-out of the development. With a private shuttle service between, at least, the closest public transportation service points (e.g., bus stops), the occupancy of the affected bus lines on Kalanianaole Highway and Mokapu Boulevard would increase. It is anticipated that the added demand for public transportation would be within the capacity of the existing public transportation system.

Both SEIS alternatives promote the use of bicycles as a contribution to the low impact development approach for the Lower site. The use of bicycles would be incentivized by secured bicycle storage and shower facilities, in accordance with LEED requirements. The largest deterrent from employees and visitor to reach the project site by bicycle, or to walk, remains the missing bikeway or walkway along the Kapa'a Quarry Road. A segment of the envisioned Kawainui Marsh perimeter path could be used to connect the project site to the regional road system. But these plans, although in the Koolau Poko SCP of 2017, have not yet been realized.

4.10 Impacts on Existing Views

Section 4.10 of the 2011 FEIS described the visual impact of the project site at the time of the 2011 FEIS and provided an assessment of the expected visual impact of future expansions.

In the time since the 2011 FEIS was approved the existing visual impact from distant views have basically stayed the same whereas the visual impact from adjacent views has changed. The changes in the visual impact from adjacent views is mainly due to the growth of vegetation along the perimeter of the Lower portion of the project site. **Section 6.6 of this SEIS document presents a comprehensive visual impact study portraying the current (2020) conditions.** This visual impact study suggests that an observer looking to the updated site development from the distant locations as well as from a locations adjacent to the project site would not experience significant adverse visual impacts. The expected low visual impact assumes implementation off proposed visual impact mitigation measures, such as planting a dense vegetation cover and larger trees on the site perimeter berms.

Appendix G of this FSEIS describes a range of visual impact mitigation measures which would be used for the project. In addition to the visual impact mitigation by the vegetation screen on the site perimeter, berm color applied to the buildings will be used to blend the new building into the background. Appendix G describes the efficacy of visual impact mitigation by color schemes for long-distance views, such as views from Kailua or across the Kawainui Marsh.

4.11 Impacts on Land Use and Zoning

Section 4.11 of the 2011 FEIS describes expected impacts on land use and zoning for the proposed site and the vicinity. The 2011 FEIS concluded that the proposed project would change existing land use and zoning at the proposed site. While the land use under the two SEIS alternatives would be different from the existing land use, the 2011 FEIS stated that the proposed land use would not be incompatible with the existing land uses. The proposed industrial development would be in an area that is already characterized by light industrial land uses, and the Proposed Action could effectively mitigate environmental impacts with a low development approach that stresses a development that is responsible towards the environment and the community.

Several issues concerning land use have changed since the 2011 FEIS was approved. These changes are described in the following sections.

4.11.1 Impacts on Land Ownership

As was stated in the 2011 FEIS and what is still valid, the proposed development would be built on land that is already under the ownership of the Applicants and therefore no changes in ownership would be required.

4.11.2 Impacts on County Land Use Designation

The 2011 FEIS described that rezoning was needed to develop the portions of the project site for light industrial uses. The zone changes for a portion of the current TMK 4-2-15:014 from General Preservation (P-2) to Limited Industrial (I-1) was finalized in 2013.

4.11.3 Impacts on State Land Use Districts

As the 2011 FEIS stated and that is still valid the project site was within the Urban state land use district and there would be no changes were required.

4.11.4 Impact on Special Management Area

As the 2011 FEIS stated and that is still valid, the Lower portion of the site was within the Special Management Area (SMA). The required Special Management Area Use permit (SMP) was obtained in 2014 and amended in 2016 and 2017 to allow for certain changes in the site development approach.

The development in the Lower site will

4.11.5 Impacts on Land Use for the Surrounding Environment

Section 4.11.5 of the 2011 FEIS described several land uses that would be affected by the proposed action:

The existing land use in the Kawainui Marsh would be affected by both SEIS alternatives. Since impact on the Kawainui Marsh holds a significant importance, potential impacts and impact mitigation are discussed in Section 4.14 of this document.

- The Proposed Action would affect the planned marsh perimeter trail system. The 2011 FEIS expected that positive effects of the proposed project would outweigh possible adverse impacts. Adverse impacts on the perimeter path were described as increased traffic on the Kapa'a Quarry Road, associated increases in noise and possibly slightly affected air quality. The Applicants offered the use of about 1,500 feet along the Eastern site perimeter for the planned trail alignment. Possible positive impacts would arise from employees and/or visitors of the trail to commute by bicycle of walking from the bus stops on Mokapu Blvd. or Kalanianaole Highway. +As discussed earlier in tis SEIS document, plans for a marsh perimeter trail have not been realized in the years since the 2011 FEIS was approved.

  Appendix J of this FSEIS describes a proposed modification of the drainage ditch along the Kapa'a Quarry Road, fronting the Lower site. The proposed modification includes the construction of a 1,500-foot section of the marsh perimeter path on land that would be donated by the Applicant for this purpose.

- The industrial operations in the Upper part of the valley would be affected by the increased traffic on the quarry road and quarry access road. The project would increase the water and electricity consumption and thus would impact the associated supply situation of the valley. The 2011 FEIS predicted that the capacity of electric supply to the Kapa'a Valley would likely have to

be increased during the development of the project. The potable and fire water supply were expected to be adequate for the area, even with the added increase in demand created by the park expansions. Municipal wastewater systems would not be affected since the Kapa'a valley is not connected to the municipal sewer system and wastewater treatment and disposal occurs within the project site.

- The traffic on the Federal John A. Burns (H3) Freeway would be affected by the project. Project bound traffic from and to the project site would use the northern segment of the Kapa'a Quarry Road. This would mean an increase of traffic coming from and going to the Mokapu Boulevard exit of the H3-Freeway. It is expected that the number of additional trips resulting from the proposed project would not constitute a significant increase of traffic on the H3-Freeway.
- The Le-Jardin Academy is located about 1.5 miles from and to the South of the project site. It is expected that students of the Le Jardin Academy and their relatives would be affected by the increased traffic volume generated by Proposed Actin. But it is expected that related impacts would be small, and that traffic mitigation would be able to reduce the impacts to non-significant levels. It is expected that both SEIS alternatives would affect the traffic volume on the entire length of the Kapa'a Quarry Road.

  Based on the 2010 traffic analysis, it is anticipated that the Northern segment of the Kapa'a Quarry Road between the project site and Mokapu Blvd. would have higher increments in traffic volume than the Southern segment. The School is located at the Southern-most segment of the Kapa'a Quarry Road, and therefore the school is likely less directly affected by traffic conditions related to the project. Besides traffic and associated impacts, no other impacts of the proposed project on the school are expected under both action alternatives.
- The Kapa'a Refuse Transfer Station is in close proximity to the proposed project. It is expected that under both SEIS alternatives, the transfer station would be affected by increases of electricity and water demand by the project, as well as increases in traffic volume. Since the transfer station is located on the Southern segment of the quarry road, the traffic impacts are Lower than on the Northern quarry road segment, where most of the additional project generated traffic would occur. The water supply to the transfer facility and other users in the affected area appears to be adequate for the anticipated increase in demand. Electricity supply would be adequate since the power supply is slated for upgrades within the next couple of months (basis November 2020).

4.12 Impacts on Population and Community services

Section 4.12 of the 2011 FEIS described the positive effects off the Proposed Action on the economic development in the Koolau Poko region and associated possible impacts on the community services. A market study, which was conducted for the 2011 environmental review, suggested that positive impacts of stimulating economic development in the region would most likely outweigh adverse socioeconomic impact.

It is anticipated that the basic findings of the market study are still valid under the updated site development plan.

4.12.1 Economic Development Impacts

Section 4.12.1 of the 2011 FEIS described main economic impacts of the proposed project using a market study that was conducted in conjunction of the 2011 FEIS and a tenant survey that was conducted by the applicants in 2010. While some site details of the development plans have changed, the basic findings of the market study are is still considered valid.

The market study suggested that through 2030, it was estimated that the Koolau Poko region would readily support about 1,000,000 square feet of additional industrial-type floor area, which included about 170,000 square feet of demand that will be created via dislocation and conversion of land use. Although an additional one million square feet would represent a doubling of the currently available industrial space in the region, the resulting leasable industrial space would still only supply about 40 percent of the average per capita allowance when compared to other major Oahu and State markets. The market study estimated that it would take about 15 to 17 years for the proposed the new industrial space to reach absorption. Since the market study referenced conditions in 2010 with a development horizon of 15 to 17 years, full build-out was projected for 2025 to 2027. Full build-out is now expected by 2030.

The market study assumed that approximately 60 to 70 percent of current tenants at the existing warehouse development were relocations of newer and existing small businesses; some upgrading from their home or non-conforming locations, seeking better value by leaving their more expensive locations to industrial developments in the Koolau Poko region, or being encouraged to locate the businesses closer to home in the Koolau Poko region. The remaining 30 to 40 percent are assumed to be new businesses, such as newly formed companies or branch locations of already existing leeward companies. For the future, the market study assumed that the newly developed industrial floor space would be about equally occupied by relocating companies as new companies. The main reason for businesses to lease space in the proposed light industrial park was to serve the windward market without incurring extra cost associated with long distances service operations to the market.

The 2011 FEIS concluded that besides the proposed project, there was limited land within the Koolau Poko region that could be converted to industrial land use. This emphasized the importance of creating industrial-type capacity by implementing the proposed action. There were and still are no viable alternatives to the proposed site for planned expansion of industrial space within the Koolau Poko Region. The 2017 Koolau Poko Sustainable Communities Plan discourages the development of any further industrial subdivisions in the region but supports the existing enterprise types in the Kapa'a valley. The market study demonstrated that the region could absorb the planned expansion of the existing warehouse area, especially with a pace of build out that matches local business demand. Leasing experience by the Applicants support the fact and that the demand for industrial space in the region remains high.

The 2011 FEIS estimated that the proposed project would generate about $50 million in new capital investment during the length of the proposed project. It is expected that total construction wages would be around $12 million. Taxes that would be generated by the operating industrial park were estimated

by the 2011 FEIS between $1.8 - $8 million for the City & County of Honolulu and the State of Hawaii, respectively.

A tenant survey conducted by the Applicants determined that of businesses leasing space at the Kapa'a Light Industrial Park approximately 57 percent of their employees resided in the Kailua and Kaneohe area. It is expected that in the future under the proposed project, this proportion would remain similar. The 2011 FEIS estimated that of the 600 full time equivalent workers to be employed at the proposed site at full build out, approximately 340 employees would come from areas in proximity to the proposed project, and the remaining 260 employees would come from other parts of Oahu, and either commute or relocate to the region.

While at this present time the market study is almost 10 years old, it is assumed that its basic premises of the benefits of the proposed project to the Koolau Poko regions are still valid, and most likely the benefits have increased. During the past decade industrial land within the Koolau Poko regions has been lost due to new developments that replaced the former industrial land use with residential of commercial space. But the demand for light industrial services within the Koolau Poko region is still there and alternatives to such services fond in the region would require ling commutes and trips for the windward residents. In addition, the SEIS does not add any new land to the industrial park but reconfigures the site already approved in the FEIS.

4.12.2 Impact to Demographics and Public Services

Section 4.12.2 described the population of the Koolau Poko region as somewhat stable. A slight decrease of about three 0.8 percent from its current 118,000 or 3,500 was anticipated through the year 2030. Current estimates are a flat to small declining population between now and 2035.

While in-migration of a certain number of new employees and their families to the Koolau Poko region was be assumed, the expected number of people would most likely be smaller than or equal to the projected decline in population people who are assumed to move out of the region by 2035. Therefore, it is expected that the net in-migration to the region in the next two decades would be essentially negative, e.g., the proposed project would not generate as many people moving into the region as people who are expected to move out of the region.

Considering site-specific consequences on public services, the 2011 FEIS anticipated the following:

Police department: It was anticipated that the Proposed Action would not result in significant added demand on the police department. The industrial development would maintain its own security service, and the development would be secured by structural (e.g., perimeter fence, security lighting, security locks) and operational measures (e.g., surveillance cameras, frequent patrols). The strict security maintained within the proposed site would also have beneficial effects on the surrounding area, since the security service would cooperate with the police department to report any unlawful acts and possible security risks in the vicinity of the park.

Fire department: The new development would be constructed following strict fire codes and using appropriate building material and the new warehouse would be equipped with sprinkler systems. The security and maintenance staff would be trained in basic fire-fighting procedures and potential fires

would be reported directly to the fire department in unchanged from the existing conditions. Since the adjacent roadways would operate at a level of service of C or better, it is expected that fire and rescue vehicles would be able to proceed as swiftly and without delay as they can do so presently.

Medical facilities: Possible consequences of the Proposed Action on medical facilities could be occasional increased work-related accidents or traffic accidents on the adjacent roads as a result in increased project-related traffic. The expected type of businesses which would lease space in the proposed project would exclude those involving hazardous materials, products, or manufacturing processes. Adding new workers in the proposed project would undoubtedly increase the potential of accidents and other incidents that may require medical intervention, but it is expected that there would be no significant adverse consequence on medical services. As indicated for the police and fire department the response time to medical emergencies at the proposed site would not be increased.

Since the updated site development plan under the SEIS Preferred Alternative would develop the same warehouse space as delineated under the 2011 FEIS it is assumed that the impacts on demographics and public services would remain negligible as delineated in the 2011 FEIS.

4.14 Impact on the Kawainui Marsh and Planned Mitigation

Section 4.14 of the 2011 FEIS described the impacts on the Kawainui Marsh. The Kawainui Marsh is a designated Wetland of International Importance (established 2005) which has a total area of approximately 830 acres of land. The Kawainui Marsh is the largest remaining wetland in the State of Hawaii and represents a site of significant environmental and cultural importance.

The marsh is an important habitat for endangered and listed water birds and numerous species of migratory seabirds and waterfowl. The marsh features several historic sites, having cultural significance dating back to the early days of Hawaiian settlements in the area. The marsh has a significant importance as a flood control for the community of Kailua immediately adjacent to the marsh. A flood control levee was built several decades ago along the Eastern side of the marsh to improve flood control after several floods in the past had caused significant damages. The marsh also serves as a natural filter to contain sediments and trap pollutants upstream of the Kaneohe Bay.

Efforts by the community and governmental agencies are underway to restore areas of the marsh, reverse various negative impacts on its natural environment, and improve habitat conditions for wildlife. The goals of these initiatives are that the marsh can function as a cultural, educational, and recreational asset for the residents of Oahu, especially the communities closest to the marsh and to visitors as well.

The proposed project is located at the North Western perimeter of the marsh and could directly impact it due to its proximity. The following subsections of Section 4.14 describe possible impacts on the marsh by the proposed action. The following sub sections also describe a range of mitigation measures that could be implemented to reduce unavoidable impacts so that the negative impacts would no longer represent significant impact potential. The fact that the Lower portion of the project site would be developed with low impact development strategies would further support impact mitigation.

While most of the considerations hereafter explicitly address impacts on the Kawainui Marsh, such analysis and mitigation measures would also apply to the wetland area in the Kapa'a Stream corridor.

Furthermore, the marsh spans approximately 1.3 and 2.0 miles in the east-west and north-south direction, respectively. Due to the considerable dimensions of the marsh, the environmental consequences of the Proposed Action would only affect a small part of the marsh. The impacts and mitigation measures discussed hereafter are therefore only limited to an area of the marsh that is directly adjacent to the proposed site.

4.14.1 Impact on Water Resources

Impacts on water resources, both surface water and groundwater, have immediate consequences and potentially the most significant impacts on the marsh. The marsh is the receiving water for the Kapa'a watershed. The main surface drainage of the Kapa'a watershed is the Kapa'a Stream, which has a total length of about 1.9 miles, approximately 0.7 miles of which is on the property of the applicant. Additional minor surface drainage from the Kapa'a watershed into the marsh occurs through some drain outlets in the vicinity of the project site. Some drainage of the watershed also flows underground following the original soil horizons. An existing drainage ditch, which is located directly mauka of the quarry road, receives seepage and occasionally surface runoff from the project site and other surrounding drainage areas. The drainage ditch is connected to the Kapa'a Stream and the confluence of drainage ditch and the Kapa'a stream is just upstream of a culvert under the quarry road, which represents the end of the Kapa'a Stream and the beginning of the marsh. As was stated earlier in the SEIS document, the conditions of the drainage ditch have significantly changed since the 2011 FEIS was approved. The drainage ditch is presently filled with soil and has a dense vegetation cover. This has caused the drainage capacity of the ditch to be impaired.

Impacts of the surface water runoff into the marsh include sediments, nutrients, suspended solids, organic loads, and other water pollutants, such as metals.

Sediments that enter the marsh primarily originate from erosion of the stream bed during high flow events and from runoff from land missing suitable soil stabilization. While the normal flow rates in the Kapa'a Stream are in the range of one to two cubic feet per second, a strong storm event can result in significantly higher flow rates. High flow rates can result in entrainment and transport of sediments to lower elevation. When the hydraulic energy of turbulent flow in the stream is no longer present, e.g., when the flow becomes less turbulent, the entrained sediments settle and result in the accumulation of sediments and in the volume reduction of water basins and flood channels in the marsh. Erosion, which means entrainment and transport of sediments, and subsequent sediments are natural occurrences in stream and receiving water and are not necessarily adverse effects. Problems arise when a watershed releases water at high peak flow rates. In case of high peak flows rainwater cannot be percolated into pervious surfaces and be consumed by vegetation covers, so drainage flows from increasingly impervious surfaces. In general, area that were converted to a higher imperviousness can cause higher peak flow rates. The Proposed Action would convert land from pervious to impervious surface and therefore would add adverse effect from high peak runoff rates if no mitigation measures were taken.

Excess sedimentation in the marsh and associated growth of vegetation on areas that are created by sedimentation could turn wetland into upland, thereby destroying habitat for aquatic fauna and water birds. Sedimentation could furthermore result in death or debilitation of sedentary organisms. In

addition to the effect of wildlife sedimentation creating upland in the marsh, sedimentation decreases the flood control function of the marsh, since a wetland area with free surface is no longer available to retain flood water in the marsh.

Mitigating flood control measures would shave off high flow rates through detention of stormwater and controlled release to the receiving water. Consequently, high runoff rate and associated erosion can be mitigated and the release of the detained water to the stream would occur when the high flow rates in the stream during and after a storm event have abated. Other measures to control high runoff rates from the project site would include collection of rainwater for subsequent use in irrigation of landscaped and restored habitat areas at the site perimeter.

Irrigation promotes the percolation of stormwater and recharging of aquifers. Evapotranspiration from plants furthermore returns the stormwater to its natural environment without contributing to site runoff and associated erosion. The existing wetland area in the lower reaches of the Kapa'a Stream functions as a natural filter that removes sediments from the stream flow and converts the organic components of sediment. The conservation of the wetland area in the stream corridor is therefore an important function that needs to be ensured to mitigate impacts to the marsh.

Nutrients in the surface drainage from the watershed can impair the water quality in several ways. The two primary impacts of excess nutrients in the water are as a potentially toxic substance, and indirectly through a process called eutrophication. Eutrophication is the accelerated growth of algae in the water stimulated by the presence of excess nutrients, nitrogen, and phosphorus. The result of runaway eutrophication is the depletion of oxygen and the release of substances that toxic to the aquatic environment. Sources of nutrients can be from entrained natural deposits or organic matter, or from anthropogenic sources, such as from wastewater. Excess nutrients can have a significant adverse consequence on the marsh.

Mitigation of nutrient release from the proposed project would be to remove nutrient sources from the runoff through wastewater treatment units. Advanced wastewater treatment and the ability to remove more nutrient than conventional septic systems could add to mitigation because of the proximity to wetland area and the Kawainui Marsh. By implementing the proposed mitigation measures, the impacts of nutrients from the proposed site to the marsh would be effectively mitigated.

Suspended solids are created by dissolving material from solid surfaces and transporting the particles downstream. Suspended solids usually cannot be separated from water through sedimentation since the particles are too small and do not readily settle when the kinetic energy of the water diminishes. The removal of suspended solids relies more on filtering and absorption mechanisms than on settling. Suspended solids contribute to high turbidity and result in degradation of the water quality in the marsh. The concentration of suspended solids in the runoff can be reduced by filtering mechanisms in the soil, biomat or dense aquatic vegetation, or by manufactured treatment devices (MTD) which feature filter processes.

Mitigation measures of suspended solids in surface water include reducing the sources of suspended solids (e.g., reduction in erosion and leaching of particles from materials) and filtering

functions in soil and vegetation as well as process of treatment equipment. Stabilizing exposed soil with vegetation reduces erosion and improves removal of suspended solids through filtering. The proposed storm water treatment system for the Lower portion of the site has an active filter process, which treats storm water runoff that is released from the detention vaults.

Organic load in water can result in adverse effects if the decomposition of organic matter surpasses the ability of the receiving water to effectively break it down. In the presence of sufficient oxygen in the water, organic matter is decomposed by aerobic processes. If the replenishment of oxygen in the water cannot keep up with the rate at which oxygen is consumed for natural aerobic processes, the oxygen concentration can get too low to sustain aquatic life. The decomposition processes would then shift to anaerobic processes which are not as productive as aerobic processes, and which can generate substances that are toxic to aquatic life. Anaerobic processes are a natural component of a wetland in which vegetation and soil naturally exist in partly anaerobic environments. Problems arise when aerobic and anaerobic processes are out of balance and anoxic environments prevail. The marsh is negatively affected by an oxygen concentration which is too low.

Mitigation measures planned for the Proposed Action would include the advanced wastewater treatment to substantially lower the organic load in the effluent where the point of release of treated wastewater is close to surface water, e.g., in the Lower portion of the project site.

Additional impacts on water resources of the marsh could originate from the release of harmful agents to the water, either directly or indirectly. For example, runoff could be polluted by leaking equipment if such equipment is operated or installed in a non-conforming fashion. Another example is the use of unsuitable herbicides or fertilizer products near or in water that could introduce toxic discharge in the water.

Mitigation measures could include the avoidance of leaking equipment or the runoff of contaminated stormwater from such equipment. Furthermore, only certified, and environmentally friendly herbicides and fertilizers should be used at the project site. The choice of vegetation used in landscaping, could also improve mitigation in an indirect manner since native and adaptive plants have a significantly Lower demand for fertilizer and herbicides than typical plants used in landscaping.

Impacts to water resources during construction and site development require comprehensive and thorough mitigation, since significant impacts typically occur during construction when larger areas of the project site do not yet have soil stabilization and therefore soil erosion and sediment loaded runoff can occur.

Mitigation measures must be implemented in accordance with local codes and state and federal laws, such as the requirements to conform to provisions of the Clean Water Act (such as the National Pollutant Discharge Elimination System (NPDES)). For the various construction projects on both the Upper and the Lower sites, storm water pollution prevention plans (SWPPP) have been developed and implemented as a prerequisite to obtain NPDES permits for the release of storm water runoff related to construction activities.

4.14.2 Impact on Vegetation

Wetland vegetation is specifically adapted to the living conditions within wetland areas and can exist and thrive in saturated soil for extended periods of time. Wetlands are characterized by applying three criteria: type of soil, periods of inundation and specific vegetation. Changes in wetland can cause changes in vegetation. For example, wetland vegetation could make way for woody or wood-forming plants, which then would nurture the conversion of wetland to upland. The growth of undesirable plants in wetlands areas could require intervention, especially when undesirable plants encroach to the wetland.

Mitigation of undesired changes of vegetation in the marsh would include controlling the encroachment of unsuitable plants to the marsh. Mitigation measures would further involve avoidance of the conversion of wetland to upland area and the restoration of wetland where needed. Avoidance of excess sedimentation would not only improve the hydrological condition of the marsh but would also help to conserve the unique wetland vegetation.

4.14.3 Impact on Wildlife

Without planned mitigation measures, the Proposed Action could contribute to adverse impacts on wildlife living in the Kawainui Marsh. Some important potential consequences are briefly discussed:

The marsh is a habitat for several endangered and listed water birds and a population of migratory seabirds and waterfowl. The U.S. Fish and Wildlife Service (USFWS) have voiced concerns that water birds could be attracted to open water surface at the project, such as the panned open detention ponds, and therefore be exposed to increased predator risks. Since formerly planned open detention ponds will be avoided in the updated site development approach, this type of attraction of water birds to the project site would be avoided.

One of the proposed options for alignment of the relocated 4 kV Kapa'a power line would be installed on the Makai side of the Kapa'a Quarry Road. The power line might pose collision risks for birds.

Mitigation measures will be implemented in accordance with recommendations and requirements of the U.S. Fish and Wildlife Service (USFWS), avoiding open detention ponds and instead using underground detention vaults.

The owner and operator of the power line, HECO, suggested to use a horizontal conductor placement, which in accordance with HECO's assessment mitigates collision risks for birds.

The proposed project might attract non-native predators such as feral cats, rats, or mongooses. These predators could be attracted by human activities and by trash stored in open containers or carelessly spread. These non-predators are a threat to ground breeding birds and other wildlife.

Mitigation measures will include continuous predator removal and control, e.g., through trapping methods. Other mitigations include removal of all sources of food for these predators from the development and instructing occupants and visitors of the warehouse development not to feed these animals.

The potential of wildlife collisions typically increases with higher traffic volume and with higher vehicle speed when effective avoidance maneuvers could become dangerous for motorists and are therefore not executed by the motorists. The Proposed Action would increase the traffic volume on the quarry road, directly causing adverse effects on wildlife collisions.

> Mitigation measures would include the development and implementation of site-specific avoidance measures for federally listed endangered species and migratory birds in cooperation with the USFWS. The reduction of the average speed of vehicles on the quarry road would reduce wildlife collision potential. (Lowering the speed on the Kapa'a Quarry Road would also decrease impact from air pollution, noise, and increase traffic safety).

Light pollution can have a significant impact on wildlife, since excess light can impair navigation of migrating birds and can reduce the food source by attracting insects and thus causing an undersupply of food for birds in areas close to bright light sources. Light pollution also impacts humans as it affects dark sky experiences.

> Mitigation of measures will be implemented in accordance with an approved light pollution study for the project site (SDC, 2016). Mitigation measures would include the control of external and internal light sources. Avoidance of "over lamping", or installation of more luminance than required for the function, would mitigate light pollution impacts. Likewise, the use of monochromatic lamps, such as low-pressure sodium lamps, has lower impacts on wildlife than brighter wide spectrum light sources.
>
> Appendix H of this FSEIS is an updated version of the accepted 2016 Light Pollution Prevention plan. Appendix H uses the same basic design principles as the 2016 accepted version and includes the new layout of the Lower site.

4.14.4 Air and Noise Impact

The primary source of air and noise pollution would be from increased traffic on Kapa'a Quarry Road.

Air impacts, the most immediate and quantitatively largest impact potential on the marsh, would come from increased vehicle exhaust, with exhaust originating from diesel powered vehicles typically being the largest impact. The direction of the prevailing trade winds is generally from the Northeast. This would primarily send the exhaust away from the marsh and would thus naturally mitigate related impacts. Other impacts on wildlife and vegetation would be the discharge of agents that could be directly harmful to living organisms, or those which could cause indirect adverse effect through adverse environmental and habitat conditions because of accumulation and of changing chemical composition in water and soil.

> Mitigation to air impacts from increased traffic would be through reduction of vehicle speed and driving habits of motorists on the quarry road. While speed is the main determinant for increased traffic related air pollution, the types of vehicles and their operational conditions are also important mitigation measures.

Active mitigation measures would include implementation of lower speed limits through appropriate signaling, enforcement and information about the merits to protect our nature through good driving, respectively. Other mitigation measures could be improvements of the quarry road to make the traffic flow more effective, by lowering the instances of frequent accelerations and decelerations, and making the traffic flow more smoothly, thereby lowering fuel consumption and reducing the exhaust of harmful agents.

Noise impacts, the largest noise potential on the marsh would originate from increased traffic volume on the quarry road. Noise can affect the marsh primarily through affecting wildlife and the resulting reduction in habitat, as wildlife retreats from areas in the vicinity to the roads. While it is generally true that noise causes loss of habitat and avoidance, habituation occurs when wildlife get used to the noise level of the environment and newer generations of animals grow up accustomed to the elevated noise level.

Noise can have a somewhat beneficial side effect of causing wildlife to leave the area next to the roads and thereby decrease the number of deaths or injuries of animals when they collide or are otherwise adversely affected by vehicles. Habituation bears the risk that wildlife re-approach the roads and thereby get endangered by increased risk of colliding with vehicles. With the direction of the dominant trade winds, noise propagates more efficiently downwind, which means away from the marsh, thereby mitigating the noise impacts via natural conditions. In addition to adverse impact on wildlife, noise is an annoyance and sometimes harmful to human beings.

Mitigation measures of noise impacts from traffic address similar mechanisms as air impacts. Noise is a strong function of the speed of vehicles and decreases measurably with lower speed. Heavy vehicles produce significantly more noise than cars at lower speeds, because of less wind generated sound energy and more audible engine noise. Noise levels are higher on streets with rough and damaged pavement than on roads with smooth asphalt. Noise is attenuated in the presence of sound absorbing surfaces, such as vegetation close to the road, which reduces multiplying sounds caused by reflection on hard surfaces.

4.14.5 Impacts through Litter and Non-conforming Waste Disposal

Litter and unsuitable and unlawful waste disposal adversely affect the appearance of the environment and cause harm to flora and fauna. Generally, increasing human activity in an area increases the potential of littering and unlawful waste disposal, especially when law enforcement is challenging, and the area is remote.

Mitigation of littering and unlawful waste disposal can be achieved through two types of measures - avoidance of littering and unlawful disposal, and swift removal. Avoidance of littering can be achieved through better education, combined with encouragement to report on cases of exceptional unlawful disposal activities. Much of the littering is due more to carelessness than malice, and educational signs and campaigns can be an effective mitigation measure.

Unlawful disposal of larger and possibly harmful objects is almost always perpetrated with intent and could only be mitigated by strict enforcement and significant fines and penalties. Over many years, the Applicants have removed substantial amounts of debris and litter from the perimeter of the proposed site and from the shoulder of the Kapa'a Quarry Road. The proposed project would continue the strict management of litter and debris from the area that surrounds the proposed site.

4.14.6 Cultural Impacts

Within and around the Kawainui Marsh there are several archeological and cultural sites of importance which are listed in the Hawaii State Register for Historic Places. Almost all sites are located at the Southern side of the Marsh, and the distance between the proposed project and these sites is between one and two miles. Given the distances, there are no direct impacts of the proposed project to these sites. One site that is located adjacent to the proposed site is the Pahukini Heiau, which is located about 2,000 feet west of the closest wetland area.

Mitigation measures are not expected to be required due to the lack of adverse impacts of the proposed project on archeological and cultural sites in and around the Kawainui Marsh. One mitigation measure is the responsible handling of cultural artifacts if found during construction. The construction would be stopped until a cultural resources manager has determined the required course of action. Communication with State agencies has indicated that no cultural and archeological sites and assets are expected at the proposed site.

4.14.7 Visual Impacts on the Marsh

Visual impacts can affect long-distance and near distance view planes in and around the marsh. A comprehensive visual impact assessment was created for this DSEIS and is presented in Section 6.6 of this SEIS document. The study concluded that the project would not significantly affect most long distance and panoramic views of the marsh. The proposed project is located within an area that has existing industrial uses and visible structures. The Upper portion of the project site is effectively shielded from direct line of sight from almost all view planes within and around the marsh. The Lower portion of the site is visible from view planes at a higher elevation in the north western area around the marsh, for example form the adjacent H3-Freeway, but is not visible from locations around and within the marsh that are at equal elevations as the project site.

One of the several proposed options for alignment of the relocated 4 kV Kapa'a power line would be installed on the Makai side of the Kapa'a Quarry Road. The power line might cause visual impact for people traveling on the Kapa'a Quarry Road.

Mitigation measures for visual impacts are the construction of vegetative buffer zones around the Lower portion of the site. The Upper portion of the site does not adversely affect the view planes around the marsh that were investigated in the visual impact assessment. Visual impact mitigation would include planting trees and shrubs around the perimeter of the site.

Appendix G of this FSEIS describes a range of visual impact mitigation measures which will be used for the project. In addition to the vegetation screen on the site perimeter berms,

appropriate color schemes will be applied to the façades of building in the Lower site to lower the visual impact from long-distance view. Appendix L describes the several alternative alignments of the relocated 4 kV power line and the visual impact mitigation which would be available.

4.14.8 Impacts on Recreational and Educational Uses of the Marsh

Conservation efforts of the Kawainui Marsh have recently gained increased support by community groups and governmental agencies to protect and enjoy the Kawainui March as an asset to the community. Appendix L of this FSEIS describes the relocation of the power line that supply the project site with electricity. Appendix L also describes expected impact of several options for the relocated power line on the environment and the community. Possible impacts could include impacts on the recreational model airplane park.

Mitigation measures to reduce impacts that would lower the recreational and educational value include lowering traffic-induced noise and air impacts on the marsh. Traffic impact mitigation measures have already been addressed earlier in this section. HECO, the owner and operator of the future relocated power line, plans to install aerial marker balls on the power lines to provide help in navigating of the model planes. The operation of model airplane on adjacent properties and public right of way is prohibited and therefore the model airplane operators should keep a safe distance from the power lines.

4.14.9 Impact to Infrastructure

The perimeter of the marsh that borders the project site features electric power lines and telecommunication cables installed on utility poles along the Kapa'a Quarry Road and the Kapa'a Quarry Place. Project related consequences to the marsh would mainly be through short term impacts to add cables to the existing utility poles and install new poles, if required, or through visual impact. Appendix L of this FSEIS describes several options for the relocation of the power line that supply the project site with electricity. Appendix L also describes expected impact of the relocated power line on the environment and the community.

Mitigation measures would address these short-term effects, such as possible replacement of utility poles along the Quarry Road. Depending on the option approved, longer-term impacts caused by the relocated 4 kV Kapa'a power line could cause visual impact and possibly traffic impact, from poles installed close to the roadway.

4.14.10 Miscellaneous Impacts

One possible miscellaneous impact to the marsh would be the danger of fire in the marsh. Historically, the marsh has been subjected to several fires in the past decades, some more serious than others. A widespread fire could significantly damage marsh vegetation. An indirect elevated fire risk could arise through increased traffic on the Kapa'a Quarry Road. Since the proposed project would greatly increase

the presence of security and protective surveillance in the area, it is expected that fire risks from arson and self-ignition of unlawfully disposed waste would be reduced.

Mitigation measures to reduce fire risks in the marsh would be surveillance and the removal of unauthorized or abandoned objects that could pose a fire hazard.

CHAPTER 5 RELATIONSHIP TO LAND USE PLANS POLICIES AND CONTROLS

Chapter 5 of the 2011 FEIS described the relationship of the Proposed Action to land use polices and controls. The discussion in this Chapter 5 updates the findings of the 2011 FEIS in accordance with the proposed changes in site development plan.

The proposed expansion of the Kapa'a Light Industrial Park (Proposed Action) needs to be consistent with the main principles of existing land use visions, policies, and guidelines for Oahu and the Koolau Poko region. This section discusses compliance of the updated site development plan of the Proposed Action with the City and County of Honolulu General Plan and the Koolau Poko Sustainable Communities Plan.

5.1 State Land Use Districts

A change of State Land Use Districts is not required. All land that would be used for the Proposed Action is presently located within the state's Urban district.

5.2 Compliance with General Plan

The following categories of the General Plan apply the proposed action:

- Economy
- Natural Environment and Resource Stewardship
- Policies of Transportation & Utilities
- Energy
- Public Safety

Sections 5.2.1 through 5.2.5 of this SEIS document describe how the Proposed Action would be consistent with the policies, visions and guidelines of the General Plan delineated in the five chapters.

5.2.1 Consistency with Views and Policies of Economic Activity

Objective A: To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policy 1: Encourage the growth and diversification of Oahu's economic base.

The Proposed Action would be consistent with this policy, since the approved FEIS square footage and the Proposed Action are nearly the same. The Proposed Action would continue to provide important infrastructure prerequisites for the growth and diversification of Oahu's economic base, built out over time and as interest and demand grow. The Koolau Poko region remains undersupplied with small service provider and light industrial space. To reach businesses which serve the Koolau Poko region from other locations on the island, customers or employees living in Koolau Poko communities such as Kaneohe and Kailua must travel considerable. Time, natural resources, and travel costs for businesses, employees and customers are saved by having modern, sustainably developed light industrial small service providers. The proposed Kapa'a Light industrial

Park would alleviate the shortage of industrial space and would help to encourage growth and diversification.

Policy 2: *Encourage the development of small businesses and larger industries, which will contribute to the economic and social well-being of Oahu residents.*

The Proposed Action would be consistent with this policy, since it would provide opportunity specifically to small businesses in the Koolau Poko area to work or establish service businesses in modern, sustainably designed space. Industrial space in the Koolau Poko region will not grow significantly and yet, having the opportunity to run locally owned and operated businesses close to home is needed for both their own cost management and for the good of the community. A survey conducted for the 2011 EIS indicated that 85 % of the businesses leasing space in the existing Kapa'a Light Industrial Park are smaller companies with less than ten employees. Seventy percent of the employees of such companies reside in the greater Kailua and Kaneohe region. And the current tenants of the Kapa'a Light Industrial Park reflect these statistics.

Policy 3: Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature:

The Proposed Action would be consistent with this policy since it would provide an appropriate location for businesses and light industries developed on the premises of sustainable site and socially responsible development. The 2013 executed zone change (City and County of Honolulu, Ordinance 13-35) to Limited Industrial (I-1) land for portions of the TMK 4-2-15:014 disqualified intensive industrial operations, which could potentially emit harmful pollutants. Since the Proposed Action is zoned limited Industrial, the nature of the proposed "light industrial" land use by means of warehouses would significantly curb potential pollutant emissions.

The Proposed Action includes sustainable design, construction, and operational methods, thereby decreasing emissions that typically accompany industrial activities. While the sustainable core and shell development approach for the warehouses would be fostered by the developer, tenants would be encouraged to streamline their businesses along the low impact development approach of the development. In certain cases, tenants would be contractually obligated to adopt low impact development strategies where required to mitigate impact that extends past the leased area. For example, tenants would need to abide by light pollution reduction and energy and water saving strategies as part of their lease agreements. The fact that the Kapa'a Light Industrial Park Lower site would be developed in accordance with LEED and would, upon completion, likely apply to be LEED certified, would help to attract businesses who are environmentally aware and would also help businesses offer more environmentally friendly products and services.

Policy 4: Encourage the development of local, national, and world markets for the products of Oahu-based industries.

The Proposed Action would be consistent with this policy, since it would provide sufficient infrastructure and warehouse space for innovative businesses that can compete with products on

the local, national and world market. The innovative nature of the development, using sustainable technologies and alternative energies promises to attract innovative thinking organizations.

Objective G: To bring about orderly economic growth on Oahu.

Policy 2: Permit the moderate growth of business centers in the urban-fringe areas:

The Proposed Action would be consistent with this policy, since it would provide the infrastructure means for existing and new businesses to grow or to provide a better long-term basis for their businesses. The capacity of the Proposed Action would be able to accommodate replacement growth. More important yet, the Kapa'a Light Industrial Park would be geared to provide the framework for a sustainable infrastructure to engage in entrepreneurial activities.

Policy 3: Maintain sufficient land in appropriately located commercial and industrial areas to help ensure a favorable business climate on Oahu:

The Proposed Action would be consistent with this policy since it would provide space for safe and sustainably designed commercial and light industrial activities to help ensure a favorable business climate on O'ahu. Oahu's 2050 Sustainability Plan calls on businesses to operate differently for the good of our overall shared future. KLIP supports these broad goals.

5.2.2 Consistency with Views and Policies of Natural Environment

Objective A: To protect and preserve the natural environment.

Policy 1: Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development:

The Proposed Action would be consistent with this policy, by developing in a manner that is environmentally responsible. The low impact development approach of the proposed warehouse development with sustainable technologies would minimize impacts on the environment and community of the proposed warehouse park.

Policy 2: Seek the restoration of environmentally damaged areas and natural resources:

The Proposed Action would be consistent with this policy, since it would be built on land that has been significantly impacted and impaired by industrial activities over the past decades. Developing the Proposed Action would improve land that has been impaired by landfill operations. The proposed project would decrease harmful runoff and would actively engage in restoring natural resources.

Policy 3: Retain the Island's streams as scenic, aquatic, and recreation resources:

The Proposed Action would be consistent with this policy, since it would implement impact mitigation that protects aquatic resources from polluted runoff conditions. The specific conditions of the Proposed Action would improve existing water quality in the Kapa'a Stream since harmful emission by leachate from the former landfill would be avoided.

Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive landforms, and existing vegetation:

The Proposed Action would be consistent with this policy, since it would consider important natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive landforms, and existing vegetation. The development of the Kapa'a Light Industrial park would follow low impact development standards of environmentally friendly and energy efficient buildings and the development would be designed and constructed in such a manner to qualify for LEED certification upon completion of the project.

The proposed project would give due consideration for the features mentioned above:

- Slope, flood, and erosion hazards: All slopes in within the development area would be stabilized with appropriate means to avoid erosion. Flood exposure would be avoided since the development would be built outside areas with defined flood hazards.
- Water-recharge areas: Rainwater would be collected from selected warehouse roof and some segments of roadways. After storage in underground taverns, the collected rainwater would be used for irrigation, thus significantly reducing potable water use for irrigation.
- Distinctive landforms would be retained within the proposed site. The existing site is a landfill area that was formed about 60 years ago. The landfill area would be graded and transform from the currently exposed soil to a surface that is resistant to soil erosion and thus avoid related impacts due to runoff that contains entrained soil.
- Existing vegetation at the site perimeters would not only be conserved but vegetation would be improved by using native and adaptive plants for landscaping and open space restoration in lieu of existing invasive plant species.

Policy 6: Design surface drainage and flood-control systems in a manner, which will help preserve their natural and cultural resources.

The Proposed Action would be consistent with this policy, since it would use an array of Best Management Practices (BMP) to create environmentally friendly drainage and flood-control systems. The stormwater management system would include the following components:

- A portion of the warehouse roofs would collect rainwater. Harvested rainwater would then be stored in underground cisterns for subsequent use of irrigation; therefore, converting impervious roof area to "semi-pervious area."
- All stormwater would be collected and treated in a comprehensive storm water system. No stormwater would be released directly to the receiving water without being treated in some form.
- The storm water system at the site includes several treatment processes. Older sections of the Kapa'a Light Industrial Park have the storm water treatment systems installed up to 25 years ago, when drainage standards were not as stringent as the current standards. Newer sections of the industrial park are designed following newer standards with significantly more stringent standards. The proposed development in the Lower portion of the project site would have storm

water systems which would surpass government standards and offer comprehensive impact mitigation.

- In the entire Lower portion of the site, as well as in portions of the Upper site with new developments, storm water detention basins are included to lower peak flow discharge rates.
- In the Upper site upstream of the detention vaults, stormwater would flow through pre-treatment units where all floatable debris and a high portion of sediments, nutrients, and oil-grease contained in the stormwater would be removed from the stormwater.
- In the Lower site upstream of the detention vaults, runoff would flow through vegetated buffer strips which are low impact development (LID) strategies which filter the runoff through vegetation.
- In the Lower portion and in parts of the Upper portions with new buildings, runoff that is released from the detention vaults would run through manufactures treatment devices (MTD) which filter the runoff before discharging off-site.
- The stormwater would remain in underground detention basin vaults for flood control. The detained stormwater would be released in a controlled manner to shave off high peak runoff flow rates which could result in streambed erosion and subsequent sedimentation in the marsh.
- For a 5-acre portion of the Upper project site, storm water would enter an existing infiltration and detention basin which was built several decades ago and has now a dense vegetation cover. This basin served earlier industrial activities in the Upper Kapa'a valley and is now available to be used. Therefore, run off from this 5-acre areas would be treated with low impact development strategies.

<u>Policy 7:</u> Protect the natural environment from damaging levels of air, water, and noise pollution:

The Proposed Action would be consistent with this policy, since it would incorporate active and passive measures to limit air, water, and noise pollution. Some examples of effective measures would include:

- Landscaping with native or adaptive plants within and at the perimeter of the development footprint.
- Using vegetative buffer zones at the site perimeter to mitigate air and noise pollution.
- Using other means to lower air pollution such as avoid unnecessary idling of engines, promoting low-emitting vehicles, promoting alternative transportation, and other measures.
- Using other means to lower noise pollution, both mitigating noise at the source and attenuating noise propagation.
- Implementing an advanced and highly effective stormwater management and treatment system for flood control, and effective removal of pollutants in stormwater.
- Implementing pollution preventing onsite wastewater treatment in the form of advanced membrane bioreactor treatment (MRB) would increase the treatment effectiveness and significantly reduce organic loads, nutrient and suspended solids compared to conventional septic systems.

Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of O'ahu:

The Proposed Action would be consistent with this policy. The low impact development approach of the Proposed Action would create habitat and vegetative buffers zones between the development and surrounding wetland areas. The existing site is not considered a habitat for endangered species but features a population of urbanized birds and small mammals. This population would find an expanded habitat in the perimeter areas of the project.

Policy 9: Protect mature trees on public and private lands and encourage their integration into new developments:

The Proposed Action would be consistent with this policy since efforts would be made to preserve mature trees at the project site. Mature trees are mainly located in stream corridor and in the eastern side of the property, but not within the interior project area. The area containing mature trees would not be negatively impacted by the new development, thus most of the mature trees would be preserved. In addition to conserving existing trees, the proposed project would plant a significant number of trees in vegetative buffer zones around the project site. The vegetative buffer zones would feature native or adaptive plants and would have densely planted windbreaks to provide effective mitigation against noise pollution, air pollution and visual impact (including light pollution).

Policy 10: Increase public awareness and appreciation of Oahu's land, air, and water resources.

The Proposed Action would be consistent with this policy since the proposed development would be designed and built based on sustainability concepts. Part of the actions under the proposed sustainability development plan, such as following LEED certification, are to support initiatives to promote awareness about the Kawainui Marsh and sustainable development.

Objective B: To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 1: Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.

The Proposed Action would be consistent with this policy, since it would be developed using a range of impact mitigation strategies to protect adjacent forests and watershed areas, marshes, rivers, and streams. The Kawainui Marsh, which is located adjacent to the proposed development would benefit from an improved watershed and water quality in the Kapa'a Stream. The comprehensive stormwater treatment and management system of the Proposed Action would improve the present water quality impacts of the present site configuration. Erosion control measures used in the proposed project would decrease the amount of erosion. Detention ponds of the proposed development would regulate the storm-water discharge by retaining water in the soil and in the ponds. The wildlife habitat on restored land upstream of the marsh would add to the biodiversity of the area.

Policy 2: Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas:

The Proposed Action would be consistent with this policy since it would utilize visual impact mitigation measures to protect scenic views. The new warehouses would be built in an attractive style that blends into the surrounding area. Trees would be planted around the buildings within development to provide "green cover" for large warehouse walls. Trees planted in the vegetative buffers around the perimeter of the Lower portion of the site would provide effective visual impact mitigation. External lighting design would avoid light pollution. The proposed project would be planned in an area where previous industrial activities have changed the appearance of the Kapa'a Valley. In contrast to the existing industrial uses in or adjacent to the Kapa'a Valley, the proposed industrial development would implement visual impact mitigation.

Appendix G describes a range of visual impact mitigation measures which would assist in preserving visual resources.

Policy 3: Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea:

The proposed Kapa'a Light Industrial Park development would be consistent with this policy since it would not impede important views of the mountains and the sea.

Policy 4: Provide opportunities for recreational and educational use and physical contact with Oahu's natural environmental.

The Proposed Action would be consistent with this policy since it may provide educational opportunities about environmentally friendly commercial and industrial developments as part of the sustainability development approach.

5.2.3 Consistency with Views and Policies of Transportation & Utilities

Objective A: To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.

Policy 9: Promote programs to reduce dependence on the use of automobiles:

The Proposed Action would be consistent with this policy since the sustainable development approach would promote the use of alternative transport modes. As part of the sustainability development approach alternative transport may include public transportation, private shuttles, bicycles, carpools, and other measures. Preferred parking would be offered for carpools and low-emitting vehicles. There would be secured bicycle racks and a locker-shower opportunity for bicycle users. At the present there are no plans to extend TheBus service to the proposed site. The use of bicycles on the Kapa'a Quarry Road is far from safe and secure and a dedicated combined pedestrian and bikeway would be beneficial to create good traffic conditions for bicyclists and pedestrians. The

Applicants would support plans to build a 1,500 feet section of the proposed perimeter pathway on their property. Portions of such ab marsh perimeter pathway could be used to reach the project site safely and comfortably from Mokapu Boulevard and Kalanianaole Highway.

Objective B: To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 3: Encourage the development of new technology, which will reduce the cost of providing water and the cost of waste disposal:

The Proposed Action would be consistent with this policy, since the proposed development would actively engage in incorporating new technology that reduces costs of water usage, as well as lowering the cost of waste disposal through recycling measures. The Applicants are currently working with the State of Hawaii Department of Health under a technology pilot project to implement an advanced wastewater treatment technology. This new wastewater technology offers significantly higher impact mitigation and therefore has higher pollution prevention capabilities than conventional onsite wastewater treatment processes.

The proposed industrial development would make use of harvested rainwater for irrigation and other applicable non-potable applications. Rainwater harvesting in concert with use of high efficiency toilets, urinals and fixtures offer a significant technology solution to reduce water consumption. Part of the sustainability development approach would be a comprehensive construction waste management plan under which significant part of material from the site would be reused or recycled.

Policy 4: Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.

The Proposed Action would be consistent with this policy, since it would actively incorporate measures to lower water consumption by recycling water and harvesting rainwater that can be used for irrigation or other grey water applications. A portion of onsite treated wastewater would be infiltrated on the site or reused for irrigation. As part of the low impact development approach, occupants of the light industrial park would be encouraged to recycle and to responsibly use resources, and facilities would be provided to make these efforts easy and convenient.

Policy 5: Provide safe, efficient, and environmentally sensitive waste-collection and waste- disposal services:

The Proposed Action would be consistent with this policy, since it would incorporate safe, efficient, and environmentally sensitive waste-collection and waste-disposal services. The Proposed Action would be consistent with LEED and implement plans that construction waste management, material reuse, recycled content of both pre- and post-consumer content, preferred use of regional material, rapid renewable material, and certified woods.

Policy 6: Support programs to recover resources from solid-waste and recycle wastewater.

The Proposed Action would be consistent with this policy since wastewater would be treated and infiltrated on site. Wastewater disposal in areas that are close to sensitive areas would include advanced treatment capabilities to significantly lower the concentration of organic loading, nutrients, and suspended solids in ten effluent. The effluent of the onsite wastewater treatment would be such a high quality to allow its use for irrigation.

Policy 7: Require the safe disposal of hazardous waste.

The Proposed Action would be consistent with this policy since it would safely collect and dispose of any hazardous waste. The type of land use in the proposed industrial development would not include industries using or manufacturing hazardous materials.

Objective C: To maintain a high level of service for all utilities.

Policy 1: Maintain existing utility systems to avoid major breakdowns:

The Proposed Action would be consistent with this policy, since it would implement and maintain, in good working order, all utilities in the proposed development. Implementation of energy savings and on-site photovoltaic electricity generation would reduce the baseline energy demand and in particular peak demand, thus mitigating system breakdown. Implementation of water saving products and use of recycled rainwater would significantly lower water consumption and preserve the existing infrastructure. Onsite wastewater treatment would provide effective treatment of sewage and avoid discharge of wastewater from the proposed development to municipally wastewater treatment plants in Kailua or Kaneohe.

Policy 4: Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day:

The Proposed Action would be consistent with this policy since it would incorporate load demand management technology to decrease peak electricity demand or to flatten out the peak demand curve over the day. In addition, the proposed development would incorporate renewable heat recovery or electricity generation by photovoltaic to lower peak demand.

Objective D: To maintain transportation and utility systems, which will help Oahu, continue to be a desirable place to live and visit.

Policy 5: Require the installation of underground utility lines wherever feasible:

The Proposed Action would be consistent with this policy since it would place all improved utilities underground within the proposed site. The future owner and operator of the relocated 4 kV power line (refer to Appendix L), HECO, plans to install the conductors on poles, since installation underground seems to be unlikely because the proposed alignment would be next to a drainage ditch, with an existing high-water table.

5.2.4 Consistency with Views and Policies of Energy

Objective A: To maintain an adequate, dependable, and economical supply of energy for Oahu residents.

Policy 1: Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on Oahu.

The Proposed Action would be consistent with this policy since it would support active and passive energy conservation. The proposed development would utilize state-of-the-art energy conservation technology and measures to lower baseline and peak demand in the proposed development. A portion of the electricity demand would be generated using on-site renewable energy systems. The project development of the Lower portion of the site would apply for LEED certification upon completion, which requires the implementation of a wide range of for sustainable technologies, including energy savings of at least 30 percent under the baseline of conventional developments.

Policy 2: Establish economic incentives and regulatory measures, which will reduce Oahu's dependence on petroleum as its primary source of energy:

The Proposed Action would be consistent with this policy, since it would promote the use of renewable energies and therefore help to reduce energy demand that is primarily based on petroleum fuel. The proposed development would promote energy efficiency that would consume electricity at levels that is below design baseline performance prescribed in conventional building codes. Effective energy savings directly helps reducing Hawaii's dependency on petroleum. The proposed development would install photovoltaic panels on rooftops to generate electricity that is either used by the warehouses on site or is net metered.

Policy 3: Support programs and projects, which contribute to the attainment of energy self- sufficiency on Oahu.

The Proposed Action would be consistent with this policy, since it would incorporate energy generation technology to provide electricity, heat, and cooling from renewable resources. The low impact development approach of the proposed project uses a wide range of active and passive building technologies to reduce energy consumption and promote renewable energies.

Policy 5: Give adequate consideration to environmental, public health, and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.

The Proposed Action would be consistent with this policy since it makes capital investments in energy efficiency and renewable energy sources. The integrated sustainability project development approach stresses a triple bottom-line to promote the economy, social responsibility, and environmental stewardship.

Objective B: To conserve energy through the more efficient management of its use.

Policy 1: Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.

The Proposed Action would be consistent with this policy since it would follow the sustainability project development approach and would make energy conservation and renewable energy important design and development goals.

Policy 2: Provide incentives and, where appropriate, mandatory controls to achieve energy efficient siting and design of new developments:

The Proposed Action would be consistent with this policy, since it would incorporate energy efficiency in the proposed development as per the LEED green building standard, or equivalent. The sustainable building and site development standards could entail the following measures:

- Commissioning of building energy systems to increase energy efficiency
- Minimum energy performance
- Refrigeration management by avoiding or phasing out CFCs (Chlorofluorocarbons) and using environmentally friendly refrigerants
- Optimize energy performance
- Onsite renewable energy
- Measurement and verification of building and tenants
- Promoting green power applications

Policy 3: Carry out public, and promote private, programs to use energy more efficiently in existing buildings and outdoor facilities:

The Proposed Action would be consistent with this policy since it would not only equip new warehouses with energy efficient technology but would also convert existing buildings to be more energy efficient.

Policy 4: Promote the development of an energy-efficient transportation system:

The Proposed Action would be consistent with this policy since it would encourage alternative transportation for the users and employees of the proposed warehouse development. The proposed development would provide bicycle friendly infrastructure with bike racks and locker and shower facilities. Preferred parking would be offered low-emitting cars, and alternative fuel cars. The Applicants promote the extension of public transportation to the proposed site, although at the moment such extension is not planned by the City & County traffic authorities. If no public transportation would be offered to serve the proposed site with public transportation in the future, the Applicants consider offer private shuttle service at a point in the development, if enough demand is being developed by businesses in the light industrial park.

Objective C: To fully utilize proven alternative sources of energy.

Policy 1: Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.

The Proposed Action would be consistent with this policy since it has been actively promoting and installing commercially available solar energy systems.

Policy 2: Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.

The Proposed Action would be consistent with this policy, since it would implement a comprehensive waste management plan, which would include recycling of glass, metal, paper, cardboard, and plastic as well as composting of some organic waste. The recycled combustible content (e.g., plastic, paper, cardboard) could be converted to energy in waste incendiary facilities. The Applicants have experience in biomass conversion at the project site.

Objective D: To develop and apply new, locally available energy resources.

Policy 1: Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:

a. Solar insulation.
b. Biomass energy conversion.
c. Wind energy conversion.
d. Geothermal energy; and
e. Ocean thermal energy conversion.

The Proposed Action would be consistent with this policy, since it would seek to attract companies that develop, build, and sell innovative energy technology. In addition, the proposed development would make efforts to attract pilot installation of innovative energy conversion technology.

Onsite renewable energy is part of the LEED Silver certification plan. At the present, the Applicants are working with the Hawaii State Department of Health on a pilot project to prove an innovative onsite wastewater treatment technology at the project site.

Objective E: To establish a continuing energy information program.

Policy 1: Supply citizens with the information they need to fully understand the potential supply, cost, and other problems associated with Oahu's dependence on imported petroleum:

The Proposed Action would be consistent with this policy since it would make efforts to engage the occupants of the light industrial park to increase the portion of renewable energy resources and save energy (thus avoiding the use of petroleum derived energy).

Policy 2: Foster the development of an energy conservation ethic among Oahu residents:

The Proposed Action would be consistent with this policy since it would actively engage the users of the park to use energy efficiently. The proposed warehouse development would be a "living proof" that energy conservation and conventional business activities are not exclusive propositions. The proposed industrial development could publicly promote responsible energy use and would therefore offer valuable "real life" application knowledge of energy efficiency, energy saving strategies and renewable energy applications. Sharing of energy and water consumption data is a prerequisite of the LEED certification plan.

Policy 3: Keep consumers informed about available alternative energy sources and their costs and benefits:

The Proposed Action would be consistent with this policy since it would engage users of the park about implementing energy conservation and using renewable energy.

Policy 4: Provide information concerning the impact of public and private decisions on future energy use:

The Proposed Action would be consistent with this policy, since it would encourage participation in energy issues of users of the proposed warehouse park, which are not only relevant to the warehouses but also of broader public interest.

5.2.5 Consistency with Views and Policies of Public Safety

Objective A: To prevent and control crime and maintain public order.

Policy 1: Provide a safe environment for residents and visitors on Oahu:

The Proposed Action would be consistent with this policy since it would provide a safe environment for the users and visitors of the proposed warehouse development. It is anticipated that the constant presence of security measures and private security patrols would decrease possible criminal activities in the areas adjacent to the proposed site.

Policy 5: Establish and maintain programs to encourage public cooperation in the prevention and solution of crimes:

The Proposed Action would be consistent with this policy since it would actively work with users of the park in the prevention of crime. It is anticipated that the development of the proposed warehouse park would lower the incidence of crime in the area since improved security on the proposed site would also positively impact adjacent areas.

Objective B: To protect the people of Oahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.

Policy 1: Keep up-to-date and enforce all City and County safety regulations:

The Proposed Action would be consistent with this policy since it would enforce all City and County safety regulations as well as additional safety regulations implemented by the users.

Policy 2: Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard:

The Proposed Action would be consistent with this policy since all buildings would be located outside high-risk flood zones and the buildings would be constructed in such a manner to not create any health or safety hazards.

Policy 6: Reduce hazardous traffic conditions:

The Proposed Action would be consistent with this policy since all private roads and intersections with public would be constructed and maintained in such a manner to reduce hazardous traffic conditions.

Policy 7: Provide adequate fire protection and effective fire prevention programs:

The Proposed Action would be consistent with this policy, since effective fire prevention and protection would be implemented, such as adequate fire water supply, fire water booster pumps, preference to fire resistant construction materials, dedicated fire accesses to the buildings and comprehensive fire prevention instructions.

5.3 Consistency with Koolau Poko Sustainable Communities Plan

This section describes how the Proposed Action would support the visions, guidelines and planning principles set forth in the Koolau Poko Sustainable Communities Plan.

5.3.1 Consistency with the Role of Koolau Poko on Oahu

The Koolau Poko Sustainable Community Plan calls for sustaining quality of life in the region by balancing and integrating environmental, economic, social, and cultural objectives. The Proposed Action would positively affect economic and social aspects of the region, while providing an attractive place of operation for commercial and light industrial businesses within a development that would be environmentally friendly and respectful to cultural concerns and the natural surroundings.

Goals for the future land use in the Koolau Poko region are shaped by the region's role to provide only flat or limited growth, preserving the nature of the area in commercial centers, and supporting single family homes, while future significant residential growth is directed instead to Oahu's Primary Urban Center and Ewa Development Plan Areas in accordance with the General Plan. The future role of the Proposed Action would be to attract beneficial new employment opportunities for residents of the Koolau Poko region, while providing modern and environmentally friendly warehouse space for light industrial and commercial uses in the region.

As was identified in the most recent update (2017) of the Koolau Poko Sustainable Communities Plan, the region acknowledges the current light industrial space near the Kapa'a Quarry.

5.3.2 Consistency with the Visions of the Sustainable Community Plan

The vision of the Koolau Poko Sustainable Community Plan is the long-term protection of community resources and its residential character as well as the adoption of improvement and developments that reflect a stable population. The two cornerstones of the plan are protecting community resources and providing improved infrastructure to serve changing needs of the population.

The first cornerstone of the plan requires the preservation, conservation, and enhancement of the region's resources, which are:

1. Natural and scenic resources
2. Cultural and historical resources
3. Agricultural resources
4. Residential environmental of neighborhoods

The Proposed Action would affect the first two resource categories of the above list, namely natural and scenic resources, and cultural and historical resources. Appropriate measures for the design, construction, outfitting and operation of the industrial development would be applied to effectively protect important community resources.

The second cornerstone of the plan calls for improved infrastructure to serve the changing needs of the population in the region. The Proposed Action would provide small service business and light industrial space which is modern, environmentally friendly and energy efficient, built out in a phased manner that matches the business demand and community need. Both environmental protection and an efficient and responsible use of energy are increasingly important and fundamental challenges for Hawaii.

Enhance existing commercial and civic districts; The Proposed Action would be an expansion of an already existing warehouse development. The future warehouse constructions would be a consistently planned development and would contain modern environmentally friendly and energy efficient warehouses.

5.3.3 Consistency with Land Use Policies, Principles and Guidelines

The relevant commercial and industrial activities that define the land use of the proposed warehouse park would include service companies, light industrial facilities, and storage facilities. According to the Sustainable Communities Plan, it is encouraged to satisfy evolving infrastructure needs for certain commercial and light industrial uses in the regions. The plan contends that the anticipated demand for industrial space in the region should be accommodated by existing industrial zones at the project site.

General Policies indicate that light and extractive industry activities in the Kapa'a Valley are accepted land uses. Therefore, the Proposed Action would be consistent with future land use plans in the region.

Applicable Planning Principles of the Sustainable Community Plan would be consistent with the proposed action, such as:

- The Proposed Action would promote alternative modes of transportation, such as bicycles and car-pooling. Though at the moment, the site is not served by public transportation, the

developer of the proposed industrial park would promote public transportation or private shuttles to serve the expanded industrial development in the futures.

- The buildings in the proposed industrial development would be built in such a manner to respect the natural surroundings.
- Landscaping features at the site perimeters would use native and adaptive plants, which offer many advantages over other plants, such as less irrigation requirements, less fertilizer, and less maintenance, to name a few.
- The development approach of the proposed industrial development would be consistent with the demand for energy efficiency and resource conservation by promoting the use of alternative energy as well as implementing comprehensive energy efficiency measures.
- The proposed development would establish comprehensive waste management programs during construction and normal operation that would include recycling and other sustainable waste reduction, use and reuse measures.

The following planned measures of the Proposed Action would be consistent with the Implementation Guidelines for light and extractive industry, set forth in the Koolau Poko Sustainable Community Plan, including:

Visual Screening, Lighting and Signage:

- Noise and other adverse impacts from parking, loading and service areas would be buffered from adjacent wildlife preserves and public roads by a vegetative buffer zones.
- Visual impact from large buildings and solid walls would be mitigated by planting trees around the buildings.

Drainage and Waste Material:

- A comprehensive stormwater management plan would mitigate water quality impacts from peak runoff from the site. The stormwater management plan would contain a range of Best Management Practices (BMPs), such harvesting of rainwater, collecting all stormwater in below ground detention vaults for controlled release to the receiving waters and removing at least 80 percent of main pollutants from the stormwater before discharge to the receiving waters. With the implementation of the proposed comprehensive stormwater management system the proposed development would result in no direct discharge of stormwater runoff into receiving water.
- Leachate from the landfill, which is a result of the landfill prior uses, would be avoided by sealing the surface of the site with impervious cover, collecting the stormwater runoff into detention vaults, and treating it efficiently before discharging it into the receiving waters.
- Litter and other waste material would be prevented from encroaching into adjacent open space using proper maintenance of the site.

5.3.4 Consistency with Infrastructure Policies and Principles

The Proposed Action would be consistent with the following policies and principles regarding public infrastructure.

Water system development: The general policies on conserving precious water resources would be adopted through planned design and operational measures:

- The sustainability development plan of the Proposed Action calls for significant water savings of 30 to 40 % compared to conventional industrial developments excluding irrigation needs.
- The proposed build-out would install only water efficient fixtures such as certified under the EPA (including low-flush toilets, waterless urinals, flow constrictors and other water conserving devices).
- Native and adaptive plants would be used for landscaped areas; drip irrigation would be used, where applicable; significant quantity of potable water would be saved with harvested rainwater being used for irrigation.

Wastewater treatment systems: The Proposed Action would minimize impacts from wastewater discharge to conserve natural resources and to alleviate current capacity problems of public wastewater systems.

The Proposed Action would be consistent with the following General Policies:

- Within the newly developed area, wastewater effluent would be treated and recycled onsite. The treated wastewater effluent would be used for irrigation, where feasible, as a water conservation measure.
- The proposed on-site treatment of wastewater would be consistent with the requested delay of further sewer connections in Kailua.
- The reduced water use in toilets, urinals and other blackwater sources would result in less wastewater generated on the site and a reduced volume of wastewater to be treated.

The Proposed Action is consistent with the following Planning Principles and Guidelines:

- The proposed development would use recycled wastewater for the purpose of irrigation, provided these uses conform with State's rules and guidelines for the treatment and use of recycled water.
- Berms or other suitable landscape elements would be used, where applicable and necessary from the design, as a buffer between on-site wastewater treatment system and adjacent buildings on the property.

Electrical and communication systems: The Proposed Action would be consistent with the applicable guidelines:

- Electrical and communication cables in the proposed development would be placed underground inside the KLIP project site.
- The proposed development would encourage and implement significant energy conservation and saving measures as well as on-site electricity generation (by renewable means); therefore, additional electrical grid capacity required by the proposed industrial development would be reduced from a normal baseline amount.
- With innovations in the communication technology, no major additions of communication assets would be anticipated for the proposed development.

Solid Waste handling and Disposal: The anticipated waste management of the Proposed Action would be consistent with the general policies of the Koolau Poko Sustainable Communities Plan, regarding to waste reduction, reuse, and recycling as well as the efficient disposal of waste.

- The design, construction and operational approach of the proposed development would follow the LEED certification.
- The proposed industrial development would actively engage in significant efforts to reduce and reuse solid waste. All or some of the following waste mitigation measures would be implemented by the proposed development, construction waste management, materials reuse, recycled content, regional material, rapidly renewable materials, and certified wood.

Drainage systems: The sustainable development approach of the Proposed Action would be consistent with drainage related policies of the Koolau Poko Sustainable Communities Plan. Due to the proximity and upstream location to important wetland area (e.g., Kawainui Marsh), the Proposed Action is committed to implement and operate a comprehensive stormwater treatment and management system to mitigate all possible adverse drainage effects.

The planned stormwater management and drainage system for the Proposed Action is consistent with the following general policies and planning principles:

- The planned drainage system design would promote control and minimization of non-point source pollution and the detention of storm water on-site; the proposed system would collect all stormwater runoff from impervious surfaces and convey it to treatment facilities and detention vaults, where the runoff would be temporarily detained and then controlled released after the storm event.
- The entire development footprint would continue to be outside the Kapa'a Stream set-back. This ensures that the natural drainage capacity of the Kapa'a Stream would not be negatively affected by the development.
- Storm water is recognized as an important source of non-potable water that should be retained for recharge of the aquifer or irrigation rather than quickly moved to coastal waters. The planned drainage strategy would collect stormwater in detention ponds and release it in a controlled way. Rainwater would also be harvested from roof areas of warehouses and selected roadway sections, stored in underground cisterns, and subsequently used for irrigation and, if possible, other graywater applications in the buildings.
- The Proposed Action would implement structural and operation measures to control non-point source pollutants.
- The Proposed Action would utilize several stormwater detention vaults of different sizes for gradual release of retained stormwater into the receiving waters. This mitigates possible stream bed erosion impacts.

Urban Design features:

It is recognized that the physical appearance or "design" of appurtenances comprising the infrastructure, individually and collectively, impact and influence the physical appearance of the

community where they are located. The development approach of the proposed industrial development would use such types of design features, building materials, layouts and operational measures that would positively affect the appearance of the proposed development. Examples of mitigation of visual impact are the vegetative buffer zones at the site perimeter, planting of trees within the vegetated buffer zones, and the avoidance of light pollution emanating from the site. The Proposed Action would therefore be consistent with the planning principles and guidelines for urban design of the Koolau Poko Sustainable Community Plan.

5.4 County Special Management Area

Approximately 70 percent of the land parcel designated as TMK 4-2-015:014, which is part of the site, is within the County Special Management Area. A Special Management Area Use permit must be obtained from the City and County of Honolulu to allow the development of the Kapa'a Light Industrial Park on that portion of the Lower portion of the parcel TMK 4-2- 015:014.

Special management areas (SMA) are regulated on the County level as part of Hawaii's Coastal Zone management (CZM) program, under Chapter 205A, Hawaii Revised Statutes (HRS). The SMA Permit system regulates development within geographically defined areas that extend from the shoreline inland as delineated in zoning maps. Aspects of development covered within SMA program guidelines include:

1. Placement or erection of any solid material or any gaseous, liquid, solid, or thermal waste
2. Grading, removing, dredging, mining, or extraction of any materials
3. Change in the density or intensity of use of land, including but not limited to the division or subdivision of land
4. Change in the intensity of use of water, ecology related thereto, or of access thereto, and
5. Construction, reconstruction, demolition, or alteration of the size of any structure

In 2014 the Applicants obtained a SMP permit for the Lower portion of the project site (Reference 2014/SMA-27).

Table 5.4.1 delineates which specific SMA guidelines, described under HRS 205D-26, apply to the proposed action, how the site is complying with the requirements since 2014, and how the Applicants will implement future mitigation measures to minimize possible adverse impacts delineated in the guidelines.

The proposed project does not qualify as a SMA minor permit, and therefore County procedures under the Special Management Area Use Permit apply. The SMP process included a thorough review by the agencies involved and public hearings is required. The public was given sufficient opportunity to be involved in the SMA permit process and is asked to provide input in possible improvements of the design approach of the project.

The SMP process included an agency review and public hearing, followed by a report to the City Council. The City Council then reviewed the case and acted in form of a resolution, which includes a public hearing.

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
1	**Reasonable terms and conditions set by the authority to ensure compliance:**		
1(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.	Proposed action conforms	The Proposed Action will not alter access to public owned or used recreation areas or natural reserves.
1(B)	Adequate and properly located public recreation areas and wildlife preserves are reserved.	Proposed action conforms	The Proposed Action will reserve public recreation areas and wildlife preserves.
1(C)	Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources.	Proposed action conforms	Measures are taken under the design approach to manage solid and liquid waste in an environmentally friendly way and minimize impacts.
1(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, wind damage, storm surge, landslides, erosion, siltation, or failure in the event of earthquake.	Proposed action conforms and provides measures to provisions that apply	The Proposed Action will implement, among other measures: • A comprehensive system of measures to decrease the visual impact • A comprehensive stormwater management system to improve the existing drainage situation and effectively control and minimize adverse runoff effect on adjacent water bodies • A comprehensive soil stabilization effort to minimize erosion and siltation. This effort will include the improvement of vegetated land around the site perimeter to restored habitat under the sustainable design approach
2	The authority, e.g., county planning commission, needs to ascertain that:		

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
2(A)	That 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, safety, or compelling public interests. Such adverse effects shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which, taken by itself, might not have a substantial adverse effect, and the elimination of planning options.	Proposed action conforms	The applicable design measures will be described in the updated project Masterplan and the sustainable design approach that is formulated to acquire LEED certification upon completion of the project.
2(B)	That the development is consistent with the objectives, policies, and special management area guidelines of this chapter and any guidelines enacted by the legislature.	Proposed action conforms	The Proposed Action is consistent with objectives, policies, and special management area guidelines, as well as other legislated guidelines.
2(C)	That the development is consistent with the county general plan and zoning. Such a finding of consistency does not preclude concurrent processing where a general plan or zoning amendment may also be required.	Proposed action conforms	The Proposed Action is consistent with the general plan. Portions of the project site have been rezoned in 2013, as required for the intended type of land use.
3	The authority, e.g., county planning commission, shall seek to minimize, where reasonable		
3(A)	Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough, or lagoon.	Proposed action conforms	The Proposed Action will not dredge or place fill into or adjacent to bay, estuary, saltmarsh, river mouth, slough or lagoon, the entire development will not include any water bodies in designated wetland areas.

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
3(B)	Any development which would reduce the size of any beach or other area usable for public recreation.	Proposed action conforms	The Proposed Action will not reduce any beach or other area usable for public recreation.
3(C)	Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management areas and the mean high tide line where there is no beach.	Proposed action conforms	The Proposed Action will not restrict public access to portions rivers and streams; the public access to the Kapa'a Stream corridor will not be altered from the existing condition.
3(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; and	Proposed action conforms	The Proposed Action will not interfere or detract for any line of sight towards the sea. Appendix G of this FSEIS describes a range of visual impact mitigation strategies for the project.
3(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.	Proposed action conforms	The Proposed Action will not adversely affect water quality in adjacent water bodies and designated wetland areas; the site is not on or within designated wetland areas or wildlife habitats.

CHAPTER 6 – SIGNIFICANT CHANGES IN SITE DEVELOPMENT STRATEGIES

Chapter 6 provides design details of site development strategies, including technology and process applications, which have changed significantly relative to the 2011 FEIS and previously approved permits. While details of these site development strategies have changed, the overall project approach and the commitment to use environmentally friendly technologies and processes have not.

In Chapter 6, previously disclosed or approved the subject site development strategies are briefly reviewed and subsequently the updated site development strategies are described in more detail.

The following site development strategies and their changes from previously approved technologies and construction approaches are described:

Section	Description of changed site development strategy	Brief description of changes and expected impacts.
6.1	Changed Project Site layout	While the overall warehouse space would stay the same (the actual change is about 0.3%) the distribution of warehouse space between the Lower and Upper portions of the site changed. The approved building layout under the SMP Minor Modification 2014/MOD-37 included a 3.4-acre base yard. The base yard was removed for the new layout under the updated site development plan, and warehouse buildings were included instead.
6.2	Storm water treatment and management	Low Impact Development (LID) strategies were added, and multiple subsystems and discharge points were used. Impacts due to non-treated storm water were reduced, as well as impact of peak flow discharges.
6.3	Full build-out finish grade of the project site	The elevation of full build-out finish grade was increased to provide required hydraulic energy for gravity from the storm water to the treatment facilities and discharge to the Kapa'a Stream corridor.
6.4	Interrelationship of the storm water system and proposed finish grade	Increased elevation of the full build-out finish grade to provide the initial elevation required to overcome hydraulic flow losses as storm water flows through the differ storm water systems.
6.5	Site perimeter berms typical cross sections	The heights of site perimeter berms were increased to provide lateral stability for the added fill.
6.6	Assessing the visual impact of the increased site perimeter berms	A visual impact study was conducted to determine what type of vegetation could serve as visual impact mitigation strategy.

Section	Description of changed site development strategy	Brief description of changes and expected impacts.
6.7	Vegetated areas inside the project site	Vegetated areas inside the site, including areas around buildings and traffic areas, were reduced. Therefore, rainwater infiltration into the landfill body and the related generation of harmful leachate was reduced.
6.8	Irrigation using harvested rainwater	Irrigation was changed from vegetated areas within the interior of the site to the site perimeter. The amount of irrigation would stay the same.
6.9	Changes of the Roadway access to the Lower project site	The roadway access to the Lower site was reduced from two access points to a single roadway access. The single road access reduced traffic by providing better visibility and a simpler traffic pattern.
6.10	Onsite wastewater treatment	A more advanced onsite wastewater treatment technology would be used that significantly improves the water quality of the treated effluent.
6.11 NEW	Relocation of the existing 4 kV power in the Lower site.	A 1,500-foot section of the 4 kV power line which supplies the KLIP passes through the Lower site and must be relocated since this section hinders the development of the Lower site. Appendix L describes several options, along with impacts.

6.1 Changed Project Site Layout

After the 2011 FEIS was approved, the layout of the project site has undergone several changes. The changes were caused by changes in building and site development technologies as well as alignment of the sizes and configuration of the warehouses to respond to customer needs. While the building configuration in the Upper portion of the project site has undergone some changes, changes have been more pronounced in the Lower site.

6.1.1 Stages in Changes of the Project Site – Lower site

This section describes changes in the site layout in the Lower portion of the site (Lower site). Three distinct stages in the design of the site layout illustrate the relevant changes.

- Stage 1 – Site Layout concept as of 2011 FEIS: The initial layout of the Lower site was described in the 2011 FEIS.
- Stage 2 - Site Layout concept as of 2014 SMP: The more detailed site layout was described in the approved 2014 Special Management Area Use Permit (SMP) (No. 2014/SMA-27 (Major)).
- Stage 3 - Site Layout concept as of 2021 SEIS: This present SEIS presents the site layout of the updated site development plan.

Sections 6.1.2. through 6.1.4 describe the configurations of the different site layout concepts described in Stages 1 through 3, respectively.

6.1.2 Stage 1 – Lower Site Layout Concept as of 2011 FEIS

Figure 6.1.2.1 illustrates the initial site layout concept as described in the 2011 FEIS. Table 6.1.2.1 shows the distribution of land uses for the initial Lower site layout concept. The sizes of the 15 buildings shown in Figure 6.1.2.1 are shown in Table 6.1.2.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	337,000	sqft	7.7	acres
Vegetated area			11.7	acres
Paved traffic area			5.0	acres
Sum	**337,000**	sqft	**24.4**	acres

Table 6.1.2.1: Distribution of land uses for the initial Lower site layout concept

Lower site layout concept as described in the 2011 FEIS

Building No. as described in Figure 6.1.2.1	Building Footprint [sqft]
1	27,000
2	21,000
3	24,000
4	24,000
5	24,000
6	24,000
7	24,000
8	18,000
9	18,000
10	24,000
11	24,000
12	15,000
13	24,000
14	24,000
15	22,000
Sum	**337,000**

Table 6.1.2.2 : Sizes of the 15 buildings in the Lower site shown in Figure 6.1.2.1

The sum of the warehouse building footprints in the Lower site were **337,000 sqft** under the 2011 FEIS.

While the 2011 FEIS delineated the preferred total size of warehouses, other elements of the site layout were defined at an initial concept design stage. Notably the vegetated land within the Lower site did not differentiate vegetated buffer zone at the site perimeter and landscaped areas inside the site.

6.1.3 Stage 2 – Lower Site Layout Concept as of the 2014 SMP

The more detailed Lower site layout was described in the approved 2014 Special Management Area Use Permit (SMP) (No. 2014/SMA-27 (Major)). This Lower site layout was based on a more detailed engineering analysis that included site full build-out finish grading, details of the site perimeter berms, landscaped areas, paved traffic areas and roadway accesses, as well as site stormwater and wastewater infrastructure. Notably, this site design added a 3.4-acre base yard to the site layout, which was not described in the 2011 FEIS. At the time these changes were made there seemed to be a strong demand for base yard space. Adding a base yard to the site layout removed space for warehouse buildings, therefore the total size of warehouses in the Lower site was significantly reduced.

Figure 6.1.3.1 illustrates the Lower site layout concept as described in the 2014 SMP. Table 6.1.3.1 shows the distribution of land uses for the initial site layout concept. The sizes of the 15 buildings shown in Figure 6.1.3.1 are shown in Table 6.1.2.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	217,000	sqft	5.0	acres
Baseyard			3.4	acres
Vegetated area			10.3	acres
Paved traffic area			6.3	acres
Sum	**217,000**	sqft	**25.0**	acres

Table 6.1.3.1: Distribution of land uses for the Lower site layout concept as described the 2014 SMP

Building No. as described in Figure 6.1.3.1	**Building Footprint** [sqft]
1	24,000
2	30,000
3	24,000
4	24,000
5	24,000
6	19,000
7	24,000
8	24,000
9	24,000
Sum	**217,000**

Table 6.1.3.2 : Sizes of the 15 buildings shown in Figure 6.1.3.1

The sum of the warehouse building footprints in the Lower site was **217,000 sqft** under the 2014 SMP.

6.1.4 Stage 3 – Lower Site Layout Concept as of 2021 SEIS

The present SEIS presents the updated Lower site development plan which removes the base yard and changes the land use of the former base yard back to land use for warehouse building space. The pervious landscaped areas in the interior of the site were removed and replaced with impervious pavement. One roadway access replaced the previously approved two roadway accesses. The full build-out finish grade elevations were increased to allow installation of a modified storm water system. The site perimeter berms were increased in concert with the increased elevation of the site finish grade.

Figure 6.1.4.1 illustrates the Lower site layout concept as described in this 2021 SEIS. Table 6.1.3.1 shows the distribution of land uses for the Lower site layout concept. The sizes of the 14 buildings shown in Figure 6.1.4.1 are shown in Table 6.1.4.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	373,000	sqft	8.6	acres
Vegetated area			6.4	acres
Paved traffic area			10.0	acres
Sum	**373,000**	sqft	**25.0**	acres

Table 6.1.4.1: Distribution of land uses for the updated site layout concept described in this 2021 SEIS

Building No. as described in Figure 6.1.2.1	Building Footprint [sqft]
1	26,000
2	24,000
3	29,000
4	22,000
5	22,000
6	24,000
7	38,000
8	29,000
9	20,000
10	19,000
11	29,000
12	29,000
13	28,000
14	34,000
Sum	**373,000**

Table 6.1.4.2 : Sizes of the 14 buildings shown in Figure 6.1.4.1

The sum of the warehouse building footprints in the Lower site is **217,000 sqft** under the 2021 SEIS.

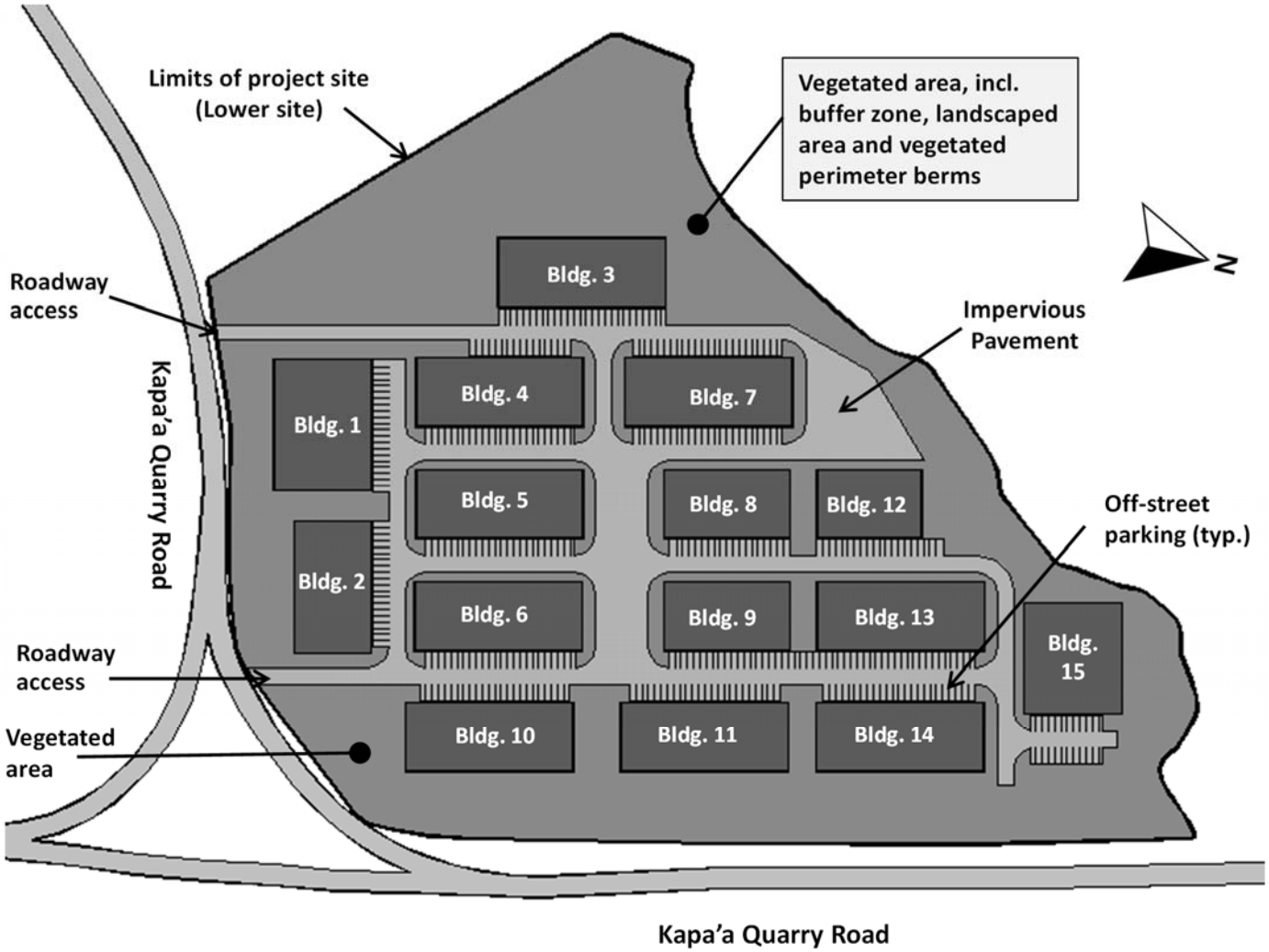


Figure 6.1.2.1: Initial site layout concept as described in the 2011 FEIA

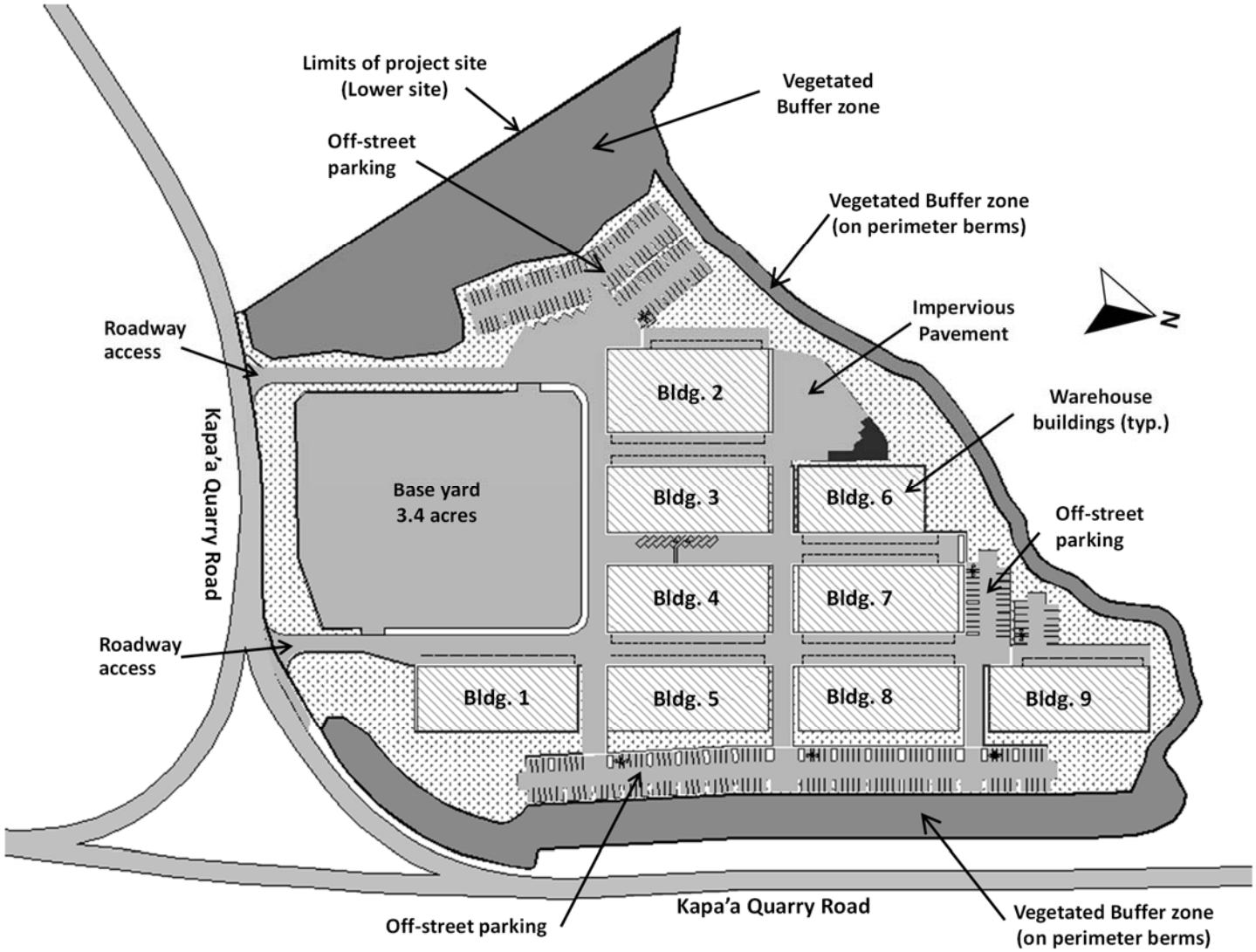


Figure 6.1.3.1 Updated site layout concept as described in the 2014 SMP

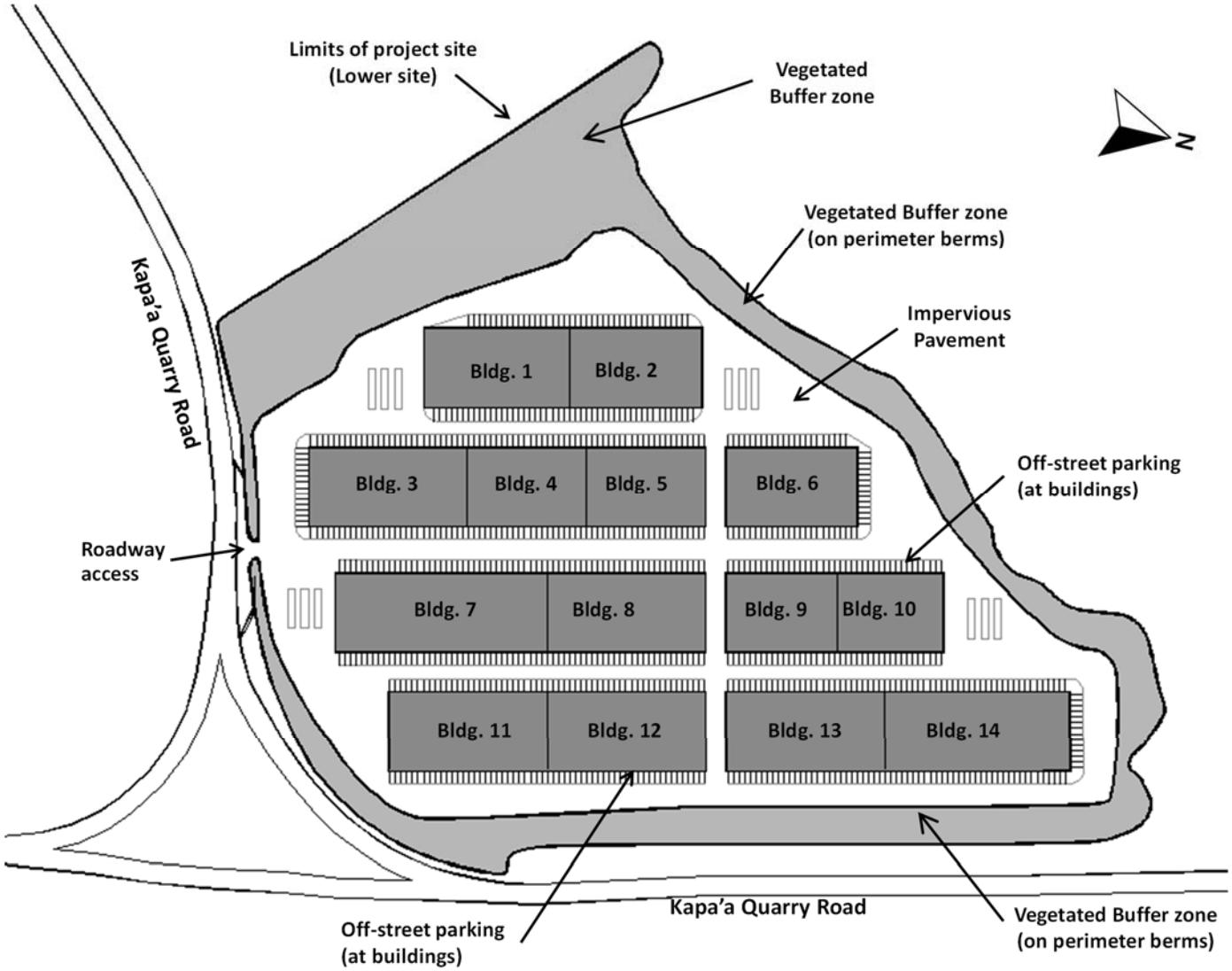


Figure 6.1.4.1 Updated site development layout concept as described in this 2021 SEIS

6.1.5 Land Use Changes from 2014 SMP to Updated Site Development Plan of 2021 SEIS

The updated site development plan presented in this 2021 SEIS incorporates several land use changes relative to the 2014 SMP land use approach. These changes are illustrated in Figure 6.1.5 and described in Table 6.1.5.1.

Changes in warehouse building footprints between the three stage are described in the following Section 6.1.6.

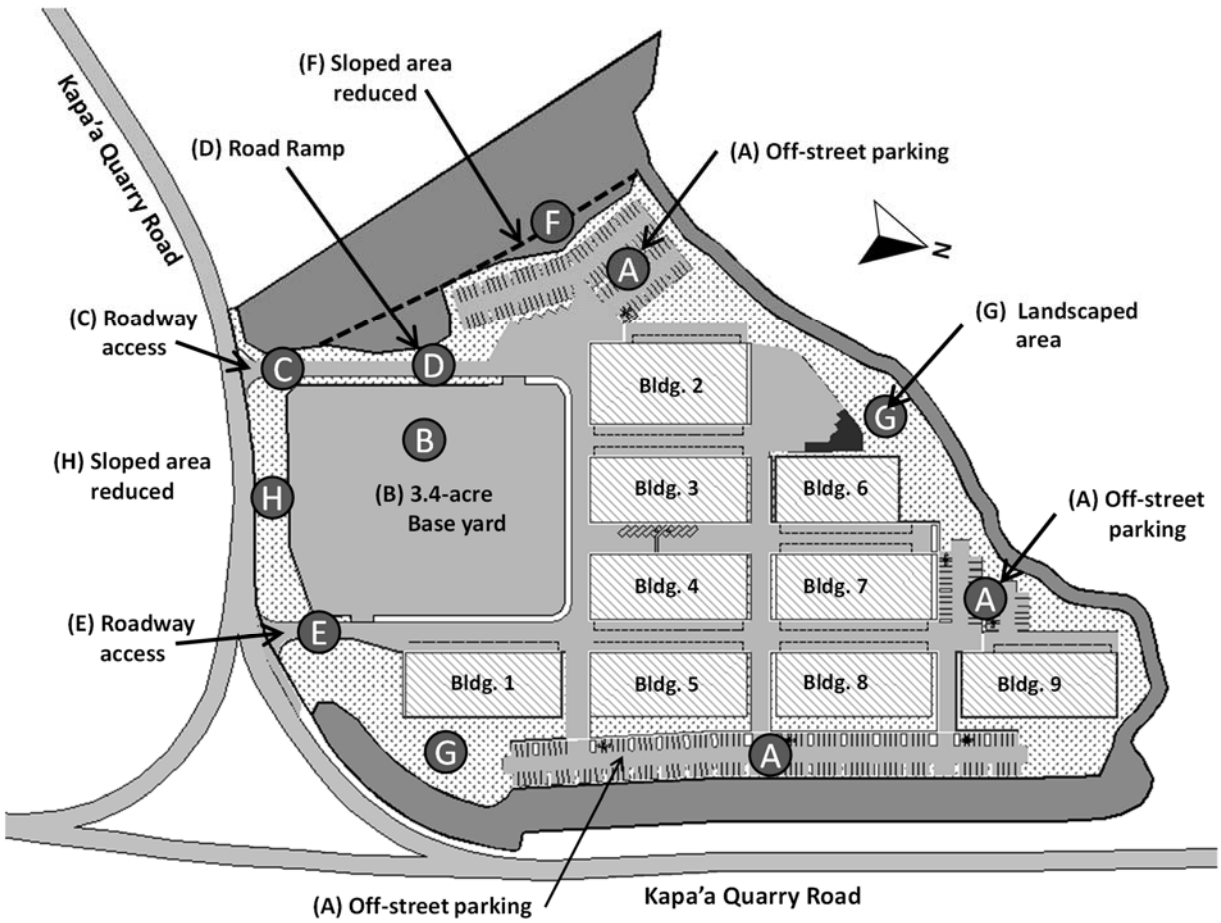


Figure 6.1.5 1: Illustration of land use changes within the Lower site between the 2014 SMP and 202 SEIS; Identifiers A through H are described in Table 6.1.5.1

Table 6.1.5.1: Descriptions of identifiers for land use changes in Lower site (refer to Figure 6.1.5.1)

Label	Description of changes and rationale for changes from 2014 SMP to the 2021 SEIS site development approach	
	Element of site development in 2014 SMP	Updated site development plan in 2021 SEIS
(A)	The 2014 SMP site plan had three larger **designated parking areas** that were separated from traffic area and buildings.	The separated parking areas will be removed under the updated site development plan. Parking will be next to the buildings throughout the project site.
(B)	The 2014 SMP site plan had a 3.4-acre **base yard.**	The base yard will be removed under the updated site development plan. The 3.4-acre area will be used to construct warehouse buildings.
(C)	The 2014 SMP site plan had a **road access** to the site that was at the Southern site perimeter, in the Western corner of the site.	The road access will be removed under the updated site development plan. Instead, a single road access will be installed.
(D)	The 2014 SMP had a **road ramp** that led from the site interior to the road access (C). A steep road ramp was required to overcome the difference in elevations of the ramp foot to the top of the ramp.	The road ramp will be removed under the updated site development plan. The ramp will not be needed since the road access (C) will be removed.
(E)	The 2014 SMP site plan had a **road access** to the site that was at the Southern site perimeter, in the middle of the site.	The road access will be removed under the updated site development plan. Instead, a single road access will be installed.
(F)	The **sloped area** at the Western site perimeter was configured to accommodate the off-street separate parking area (A) and the road ramp (D).	Under the updated site development, the sloped area at the Western site perimeter will be shaped to provide a blended transition from the finish grade to the sloped area that separates the Upper and Lower portions of the project site.
(G)	The 2014 SMP site plan had **landscaped area** within the interior of the site – e.g., inside the site perimeter buffer zone.	Under the updated site development plan all landscaped areas inside the site will be removed and replaced with paved traffic areas around the buildings.
(H)	The 2014 SMP had a sloped area between the Kapa'a Quarry Place roadway and the base yard area. .	Under the updated site development plan this sloped area will be significantly narrower since the elevation difference between the roadway and the adjacent site will be smaller.

6.1.6 Changes in Building Sizes in the Lower Site Between the Three Site Development Stages

The warehouse building individual sizes and the overall amount of building footprint in the Lower site are different in the three site development stages. Table 6.1.6.1 shows the warehouse footprints under the three site development stages.

Table 6.1.6.1 Warehouse footprints under the three site development stages

Site development stage	Approved or presented in	Building footprint In Lower site [sqft]	Building footprint Total for project site [sqft]
Stage 1	2011 FEIS	337,000	889,000
Stage 2	2014 SMP (2014/SMA-27)	217,000	769,000 (*)
Stage 3	2021 SEIS (updated site development plan)	373,000	883,000

Note (*): Site under the 2014 SMP had a 3.4-acre base yard.

The significant change in site layout between the approved 2014 SMP and the proposed updated site development plan under this 2021 SEIS is the removal of the 3.4-acre base yard. Under the updated site development plan the 3.4-acre area will be used to build warehouse structures. Figure 6.1.6.1 illustrates the extent of a 3.4-acre equivalent base yard area filled with warehouse structures under the updated site development layout.

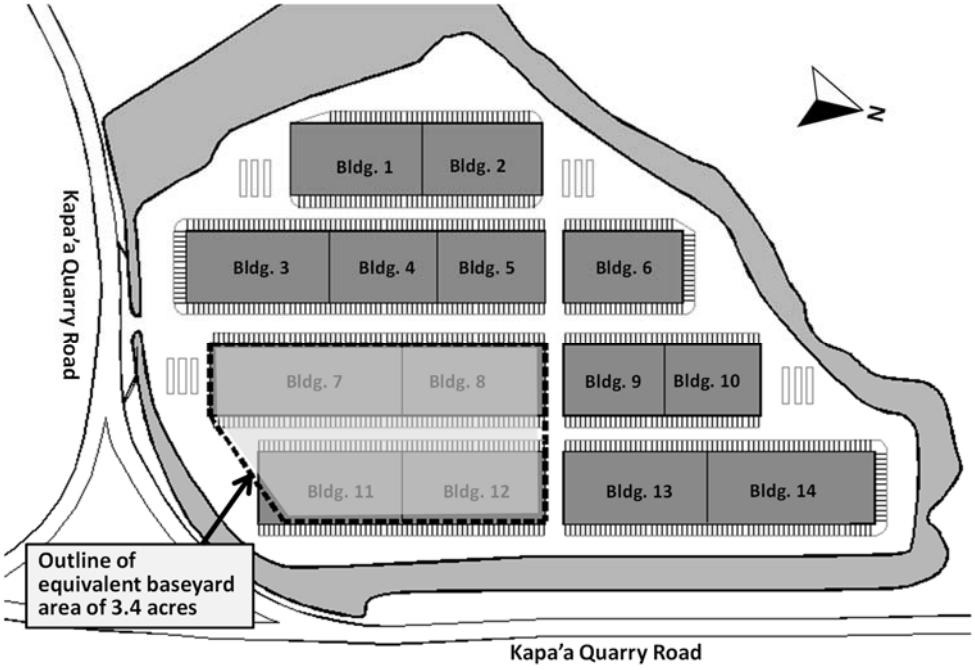


Figure 6.1.6.1: 3.4-acre area equivalent to the basyard

Figure 6.1.6.1 illustrates that the warehouse buildings 7, 8, 11 and 12 would occupy the 3.4-acre space of the former base yard area. These four buildings 7, 8, 11 and 12 would have a combined footprint of 125,000 sqft, under the building configuration of the new Lower site layout. While the planned total warehouse footprint in the Lower site is 373,000 sqft, subtracting the 125,000 sqft would leave remaining warehouse building footprint of 248,000 sqft outside the 3.4-acre area.

This 248,000 sqft footprint compares with the 217,000 sqft of warehouse buildings besides the base yard in the 2014 SMP. Applying this 31,000 sqft difference to the 248,000-sqft Lower site layout under the updated site development plan would be a 13% please increase relative to the approved building density under the 2014 SMP. This 13% increase of warehouse footprint would be a relatively small increase in building density.

6.2 Storm Water Treatment and Management

The storm water treatment and management system under the updated site development plan differs significantly and in an improved way from the approach delineated in the 2011 FEIS and subsequent plans approved under the special management area permit process. The storm water treatment and management approach are significant to the site development because effective storm water treatment and peak flow management will mitigate possible runoff problems at the source, and before storm water reaches the aquatic resources around the project site.

Perhaps no site development strategy has gone through such significant changes as storm water treatment and management. Current storm water regulations require much more stringent impact mitigations to assure good water quality than at the time the 2011 FEIS and 2014 SMP was approved. This is specifically important for locations such as the project site, which is adjacent to sensible aquatic resources, including the important Kawainui Marsh and other wetland areas.

This section will briefly review the latest storm water treatment and management approach, which was approved in the SMP Minor Modification 2017/MOD-37. Based on recent engineering findings, this approved storm water system approach can no longer be implemented because of soil stability concerns of the site perimeter berms due to the proposed infiltration of storm water upstream and close to the earth berms.

Following this engineering guidance, a new storm water approach was designed to avoid the indicated problems and offer effective impact mitigation. This section briefly describes previously approved storm water system and the reasoning why it is no longer pursued. Following this review, the new storm water approach will be described in more detail.

6.2.1 Previously Approved but Abandoned Storm Water Treatment and Management Approach

The storm water treatment and management approach under the 2014 SMP used specific low impact development (LID) strategies to treat storm water and control peak flow events. This represented an innovative step relative to the original storm water concepts described in the 2011 FEIS:

- In adopting Low Impact Development (LID) Stormwater strategies, infiltration was adopted in lieu of the detention and subsequent surface release of the detained stormwater without further treatment.
- Infiltration of stormwater was to occur in infiltration trenches at the site perimeter. This approach was consistent with the Applicant's commitment of avoiding infiltration of precipitation in the land fill body and within the inner site area.
- Infiltration of stormwater was planned through below-ground infiltration tanks which were structurally supported by plastic modular elements with a high void ratio. The void ratio of the modular tanks was significantly higher than conventional rock filled infiltration trenches resulting in a smaller footprint and less susceptibility to structural loads due to differential settling.
- The infiltration tanks were to be installed at the site perimeter in newly added fill, using soil specifically mixed with good infiltration characteristics, thus avoiding the generation of harmful leachate.
- Pretreatment units were added upstream of the infiltration tanks to reduce suspended solids as well as oil and grease.
- A vegetated swale, a LID stormwater strategy, was located above infiltration tanks. Water in the vegetated swale was to infiltrate and collect in the infiltration tank from where it would eventually infiltrate in the adjacent substrate and migrate downstream towards an existing drainage canal.
- A rainwater harvesting system was integrated into the stormwater management system. Rainwater harvesting was planned from rooftops of selected building. The rainwater was then planned to be stored in underground tanks. When the rainwater tank overflowed the runoff from the roofs would be discharged to the stormwater discharge area, from where the runoff would be conveyed to the vegetated swales and stormwater infiltration tanks at the site perimeter.
- The type of the rainwater harvesting tank design was like the infiltration tanks, with the difference that an impermeable liner would confine the collected water and avoid losses through infiltration.
- The sizing of the rainwater harvesting tanks was based on precipitation and evaporation rates for a representative windward region near the project site.

The working principle of the storm water approach is illustrated in figures 6.2.1.1 and 6.2.1.2. Figure 6.2.1.1 shows a representative cross section of the combination of the vegetated swale and below-ground infiltration tank. Figures 6.2.1.2 illustrates the working principle of the system. Storm water flows through vegetated swales and percolates through the substate to fill vaults which are located below the vegetated swales. The vaults would serve as a combination of storm water detention tanks and infiltration vaults.

The proper working order of this combination of storm water detention and infiltration vaults depends on the satisfactory performance of two processes:

First, the effectiveness of percolation of the storm water and migration through the soil below the site perimeter berms toward the existing drainage trench, and second, the capacity of the existing drainage trench along the Kapa'a Quarry Road to convey the water that accumulates in the trench, both the

water that migrated through the berms and water that overflowed the infiltration tank. Both processes have been rendered uncertain through subsequent observation and engineering design assessment.

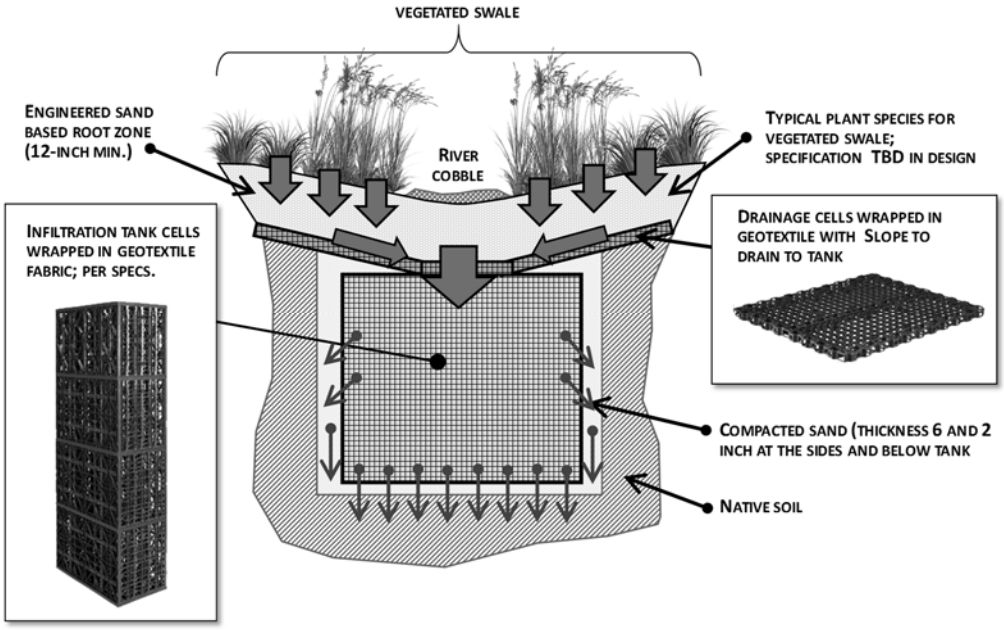


Figure 6.2.1.1: Representative cross section of the vegetated swale and below-ground infiltration tank

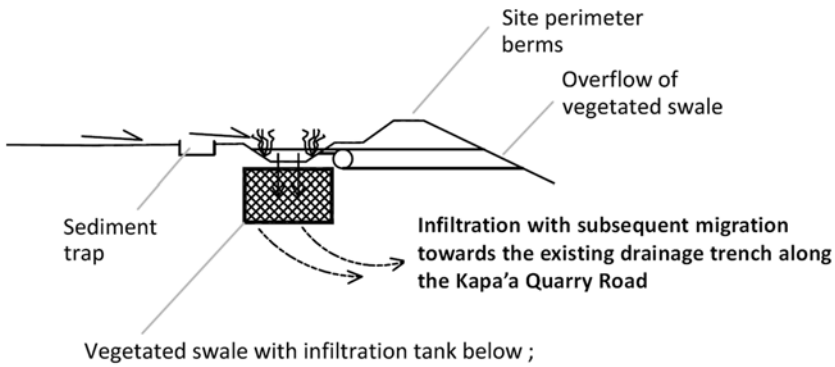


Figure 6.2.1.2 (a): Working principle illustration of the previously approved storm water treatment and management system

Infiltration and underground migration of water

(a) After storm water infiltrated it would migrate under the site perimeter berms and toward the existing drainage trench.

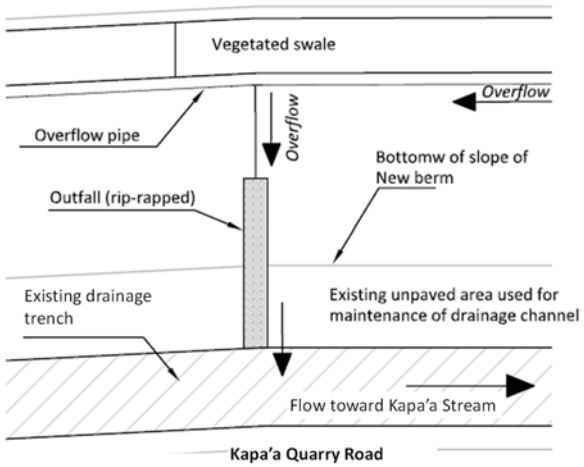


Figure 6.2.1.2 (b): Working principle illustration of the previously approved storm water treatment and management system

Overflow when detention vaults are filled.

(b) When the infiltration tanks were filled to capacity, the overflowing water would be conveyed through the perimeter berm and discharged into the existing drainage trench along the Kapa'a Quarry Road.

The following two reasons challenged the satisfactory functioning of the two necessary functions described above in Figure 6.2.1.2 (a) and (b:)

<u>Infiltration of storm water upstream and close to the site perimeter berm:</u>

A geotechnical report commissioned by the Applicants (Stewart Engineering, 2019) in support of a mass grading permit application indicated that there are possible soil instability concerns of the perimeter berms caused by water percolating below the berms. The following quotes are from that geotechnical study:

"*Prevention of runoff onto the perimeter slopes is especially important.*

It is especially important to keep water from ponding at the tops of slopes or infiltrating into slopes, which could significantly reduce their stability. Final grades and facilities must prevent surface runoff from running onto the faces of all slopes, especially fill slopes, and to minimize water erosion of any exposed soil on the slopes.

In addition, sumps and seepage pits are not recommended near slopes since infiltration and percolation of runoff into the slopes can significantly reduce the stability of the slopes. Many of the existing clayey perimeter slopes are considered marginally stable and additional water could generate localized slope failure or accelerate slope creep." Quotes from Stewart Engineering (2019) "Geotechnical Exploration Report, Kapa'a Light Industrial Park, Mass Grading, Phases 1 and 2, 21.7-Acre Portion of 43-Acre Parcel, Kailua, Oahu, Hawaii, TMK: 4-2-015: 006", by Stewart Engineering, Inc., Kailua, Hawaii, dated September 5, 2019.

<u>Using the existing infiltration trench to convey larger volumes of water drainage:</u>

Observation of the existing drainage trench over the past couple of years have revealed that the existing drainage trench has become filled with sediments and that vegetation is covering the previous trench. No free surface can be observed in the trench. With the existing deteriorating trench conditions

significant amounts of drainage water from the project site could not be readily conveyed to the Kapa'a stream corridor.

Consequently, the previously approved storm water treatment and management approach was no longer considered, and a new storm water system was designed.

6.2.2 Storm Water Treatment and Management Approach at the Time of the 2011 FEIS

Figure 6.2.2.1 shows the Kapa'a site conditions at the time of the 2011FEIS. At that time there were 30 warehouses within the Upper site and within parcel TMK 4-2-15:013. The warehouses were surrounded by paved and impervious traffic area. The remainder of the Upper site was graded land that was used by land tenants. Figure 6.2.2.2 shows the drainage patterns of the project site at the time the 2011 FEIS was approved. The identifiers A through F used in Figure 6.2.2.2 are described the following:

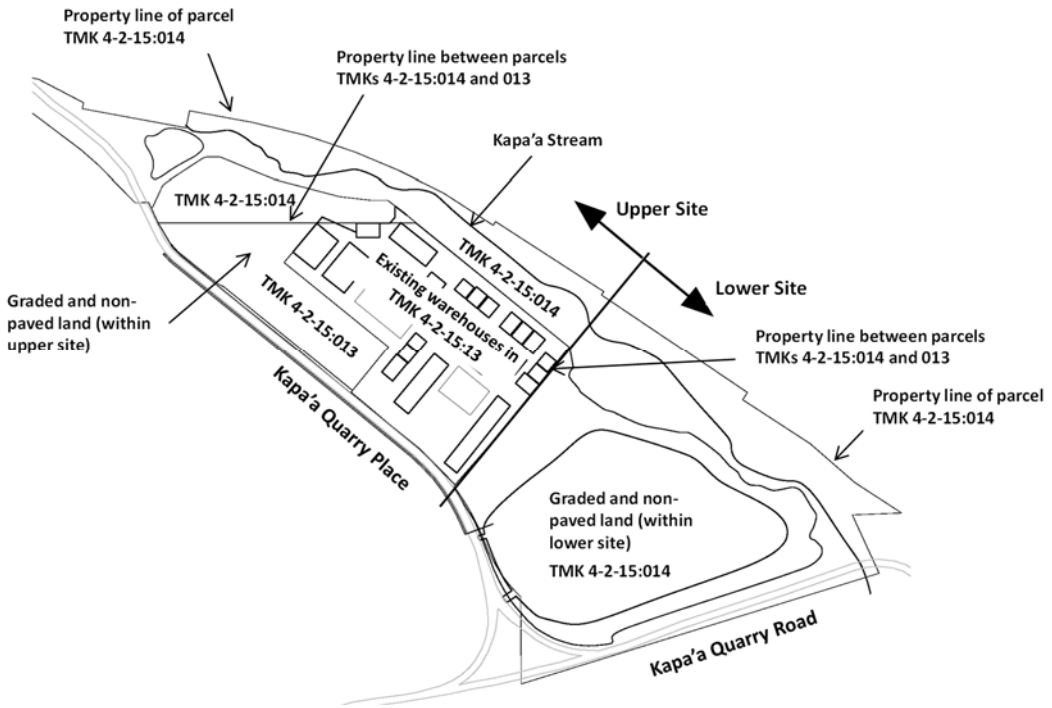


Figure 6.2.2.1 : Project site at the time the 2011 FEIS was accepted (under 2011 FEIS)

Identifier	Upper / Lower site	Description
A	Upper	The combined runoff from the paved traffic areas and building roofs discharged to the sloped and vegetated site perimeter through 6 drain inlets.
B	Upper	The runoff from the gravel areas discharged as surface sheet flow over the edge of the sloped and vegetated site perimeter
C	Upper	The combined runoff from the paved traffic areas and building roofs discharged as surface sheet flow over the edge of an existing 0.75-acre infiltration and detention basin.

Identifier	Upper / Lower site	Description
D	Upper	A portion of the gravel areas discharged runoff towards the roadway. During heavy rain events runoff flowed across the road pavement and finally discharged to a vegetated swale along the Kapa'a Quarry Place. The vegetated swale also collected runoff from a portion of an adjacent land parcel as well as from Kapa'a Quarry Place roadway itself.
E	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to the Kapa'a Stream corridor.
F	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to an existing drainage ditch along the Kapa'a Quarry Road.
G	Lower	The runoff in the vegetated swale along the Kapa'a Quarry Place entered a pipe conduit under the Kapa'a Quarry Place roadway and flowed through a 300-foot drainpipe and was discharged to a vegetated swale inside the Lower site, downstream of the drainpipe terminus. In the vegetated swale the runoff flowed towards the Kapa'a Stream corridor.

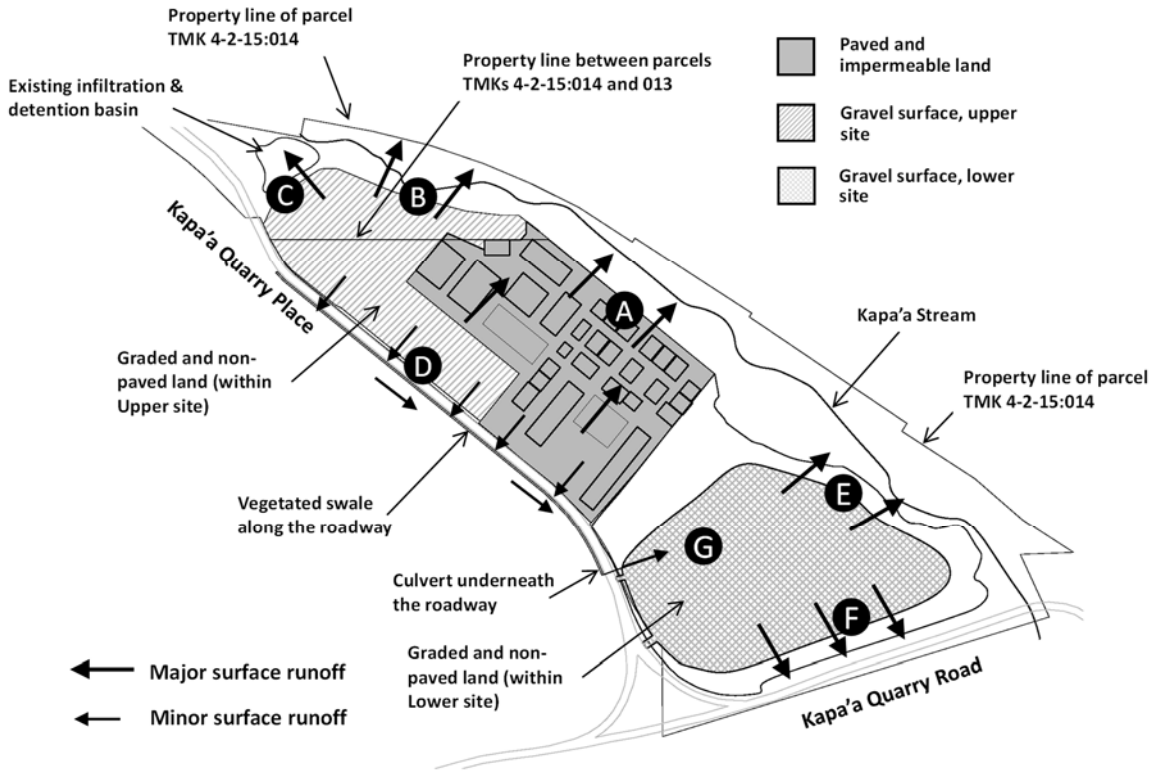


Figure 6.2.2.2: Schematic storm water management if the site at the time the 2011 FEIS was accepted

Figure 6.2.2.3 shows a schematic of the runoff from the Upper site which enters the vegetated swale along the Kapa'a Quarry Place roadway. The runoff flowed Eastward through the 1,400-foot vegetated swale until the runoff entered a drainpipe conduit below the roadway and was conveyed to the Lower site. At the terminus of the drainpipe the runoff entered a wider vegetated area. While some quantity of the runoff infiltrated, some runoff entered the Kapa'a Stream corridor as surface runoff.

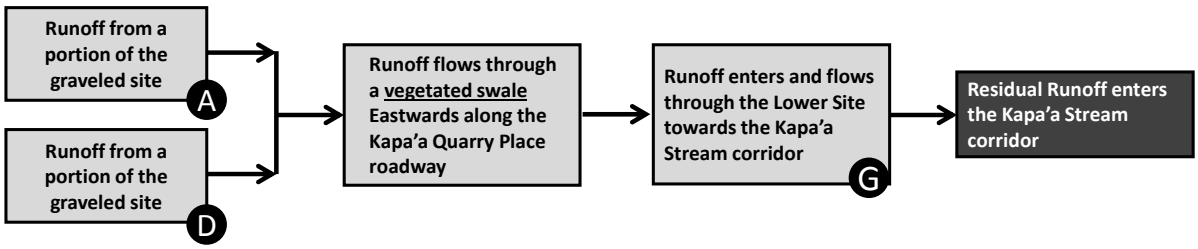


Figure 6.2.2.3: Diagram of the runoff discharge through the vegetated swale along the Kapa'a Quarry Place roadway

6.2.3 Storm Water Treatment and Management under the Updated Site Development

Appendix C describes the updated storm water system. The Accepting Agency requested several changes to the storm water system of the Lower site, which were described in the DSEIS. Appendix C provides a comprehensive description of the updated storm water system for the Lower site and presents an undated analysis of the storm water flows, including an assessment of how much flow bypasses the detention vaults. The applicable figures and tables are changed in this section and changes are indicated in the text.

The approach to treat and manage the storm water runoff from the site at full build-out conditions differs significantly from the approach that was used at the time the 2011 FEIS was accepted. In general, the treatment and flood control approach of the storm water runoff for most of the portions of the full build-out site will be significantly more effective than the storm water approach at the time of the 2011 FEIS. This increase in effective treatment was applied to areas which were developed since the 2011 FEIS and which will be developed until full build-out of the project site is reached.

Figure 6.2.3.1 shows the proposed project site development with the main development elements at full build-out. From the 30 warehouses in the Upper site at the time of the 2011 FEIS, 10 warehouses will be added in the Upper site and 14 in the Lower site at full build-out. The existing infiltration and detention basin adjacent to the TMK 4-2-15:014 in the Upper site will be used to provide Low Impact Development (LID) storm water treatment and flood control.

It should be noted that a storm water treatment and management strategy that was proposed by an agency was to discharge storm water from the Lower site to the existing infiltration and detention basin adjacent to the TMK 4-2-15:014 in the Upper. Due to the higher elevation of the existing infiltration and detention basin relative to the Lower site this strategy would not be feasible.

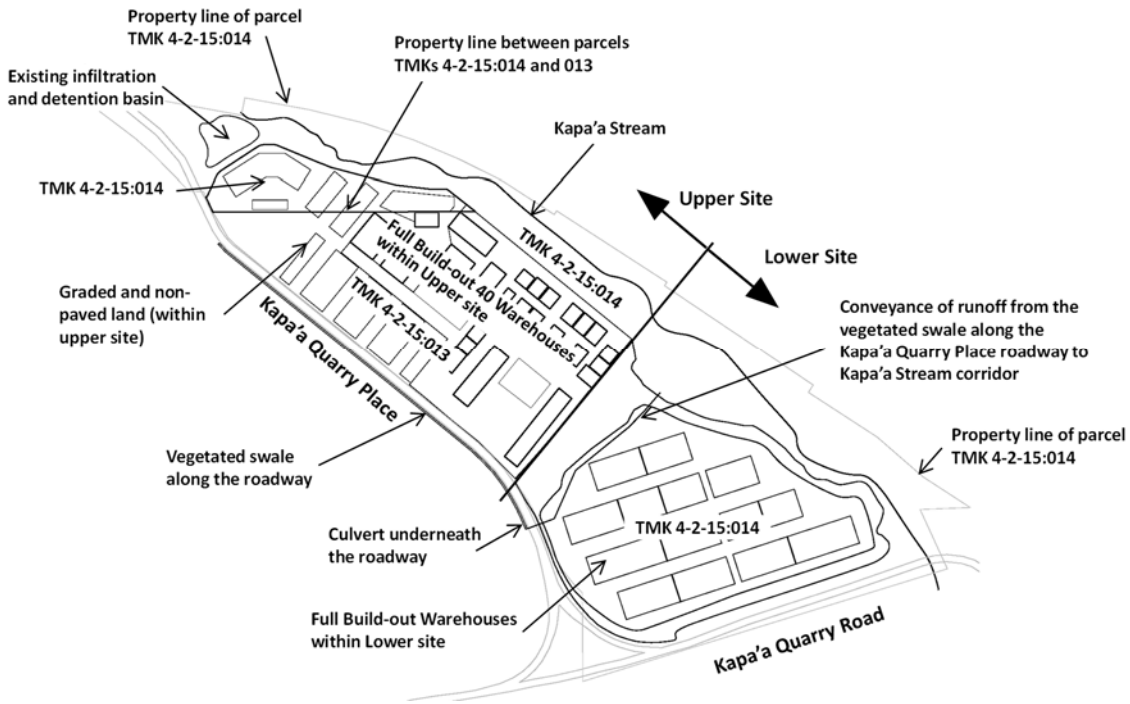


Figure 6.2.3.1: Project site at Full Build-out

Under the revised site development approach of the storm water systems for the entire project site, six distinct drainage areas 1 through 6 areas can be distinguished, which have their own specific storm water treatment and management process. These six distinct drainage areas are described in the following:

<u>Drainage area 1 – Upper site:</u> Figures 6.2.3.2 and 6.2.3.3 illustrate the storm water runoff patterns of the shaded portion of the full build-out project in the Upper site with **limited changes** in the stormwater treatment and management strategies relative to the 2011 FEIS. This portion of the project site has warehouses that were built before the 2011 FEIS. The entire area has impervious pavement and warehouse roofs.

Annotations used in Figures 6.2.3.2 and 6.2.3.3

Identifier	Description of the stormwater treatment approach
A	The four existing drain inlets have been improved by catchment baskets
B	The existing below ground outfall from one existing drain inlet is still being used. The drain inlet has been improved by adding pretreatment screens
C	A small portion of the site still discharges runoff to the existing vegetated swale along the Kapa'a Quarry Place roadway
D	The runoff that enters the Lower site is conveyed through a below ground drainpipe to an armored outfall structure at the site perimeter

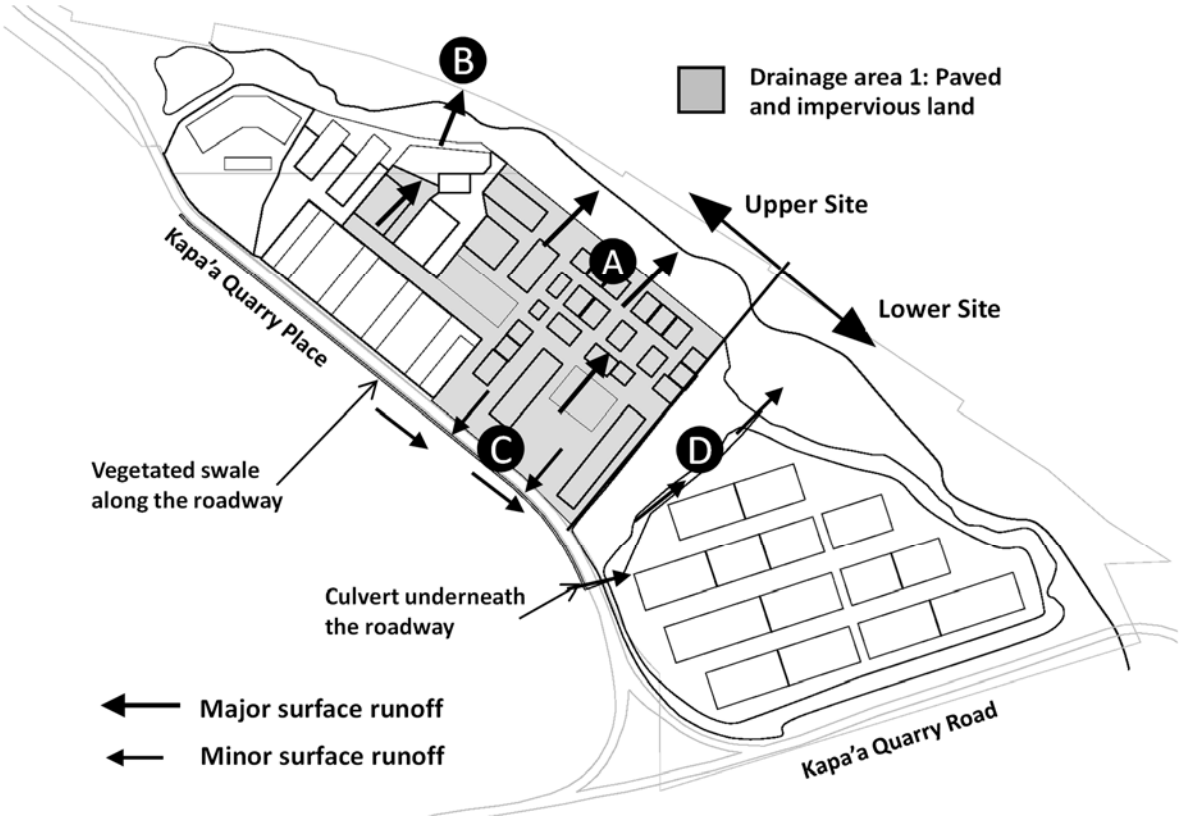


Figure 6.2.3.2: Drainage area 1 with limited changes in the storm water treatment strategy

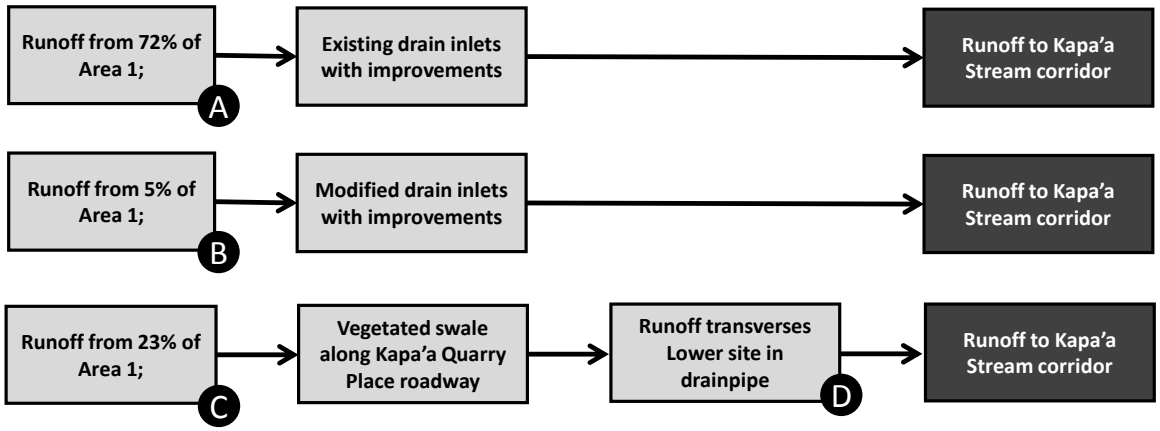


Figure 6.2.3.3: Flow diagram of the storm water runoff from Drainage area 1

<u>Drainage area 2 – Upper site</u>: Figures 6.2.3.4 and 6.2.3.5 illustrate the shaded portion of the full build-out project in the Upper site with **significant improvements** of the existing stormwater treatment and

management strategies. Drainage area 2 includes existing warehouse structures. The existing drain inlet and simple downstream outfall was replaced by a new manufacture treatment device (MTD) which filters the runoff before discharging it (A). The discharge of Area 2 occurs via a new armored outfall structure. Using the storm water filtration device (MTD) and the new outfall structure is possible since the stormwater treatment of Area 3 (see below) was designed with reserve capacity to accommodate Area 2. This storm water treatment strategy is a significant improvement over the existing treatment.

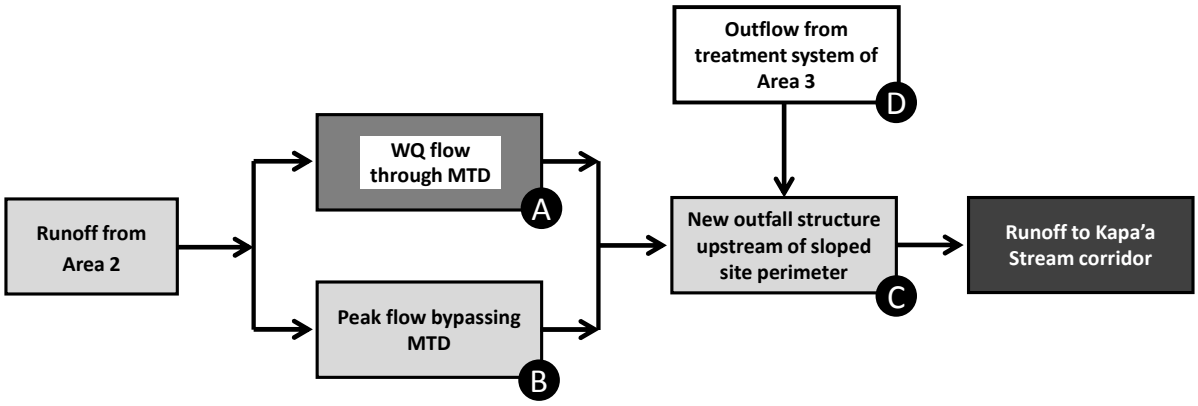


Figure 6.2.3.4: Flow diagram of the stormwater runoff from Drainage area 2

Annotations used in Figure 6.2.3.4

Identifier	Description of the stormwater treatment approach
A	The portion of the runoff from Area 2 which is designated the water quality (WQ) flow enters a drain inlet that connects to the MTD unit. The MTD units is a filtration devise which treats the entire WQ flow.
B	During heavy rain events the runoff exceeds the WQ flow rate. The exceeding runoff flow bypasses the MTD and discharges over a new outfall .
C	A new and armored outfall was constructed to safely guide the runoff down the vegetated site perimeter slope.
D	The MTD unit and the new outfall were designed to accommodate the flow from Drainage area 2 as well as from Drainage area 3.

Figure 6.2.3.5 indicates the location of the Drainage area 2 in the Upper site.

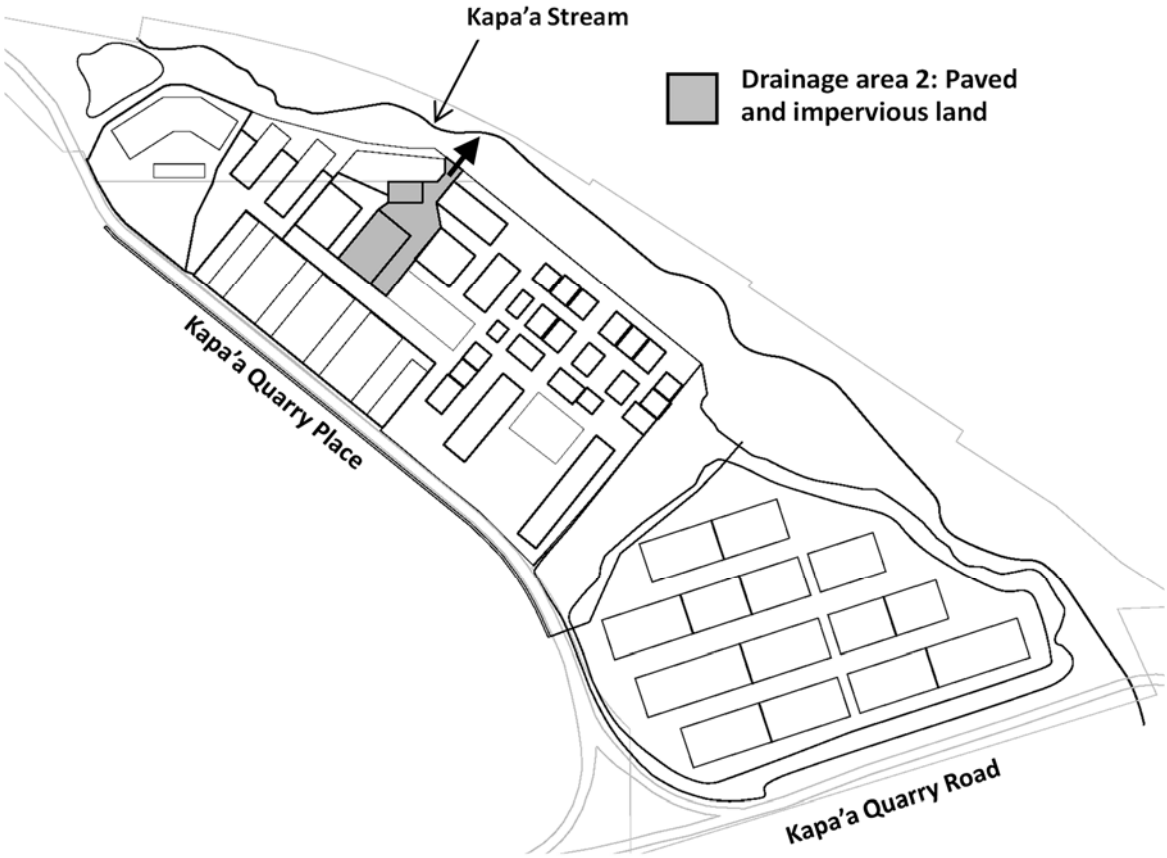


Figure 6.2.3.5: Area 2 with significant upgrades of the exiting stormwater strategies

<u>Drainage area 3 – Upper site:</u> Figures 6.2.3.6 and 6.2.3.7 illustrate the shaded portion of the full build-out project in the Upper site with buildings. The development area in the Upper site is presently (as of September 2020) under construction and slated for completion by 2022. At full build-out Drainage area 3 will be a 4-acre drainage area comprised of paved traffic area and five warehouses. The project was designed and will be completed under new 2018 storm water ordinances. This requires storm water treatment of the designated WQ flow and detention for flood control.

The detention volume is provided by a system of large diameter drainpipes and a water reservoir with an overflow weir. The storm water runoff in the detention vault is released during of a minimum period of 24 hours so that high peak flow rates are avoided.

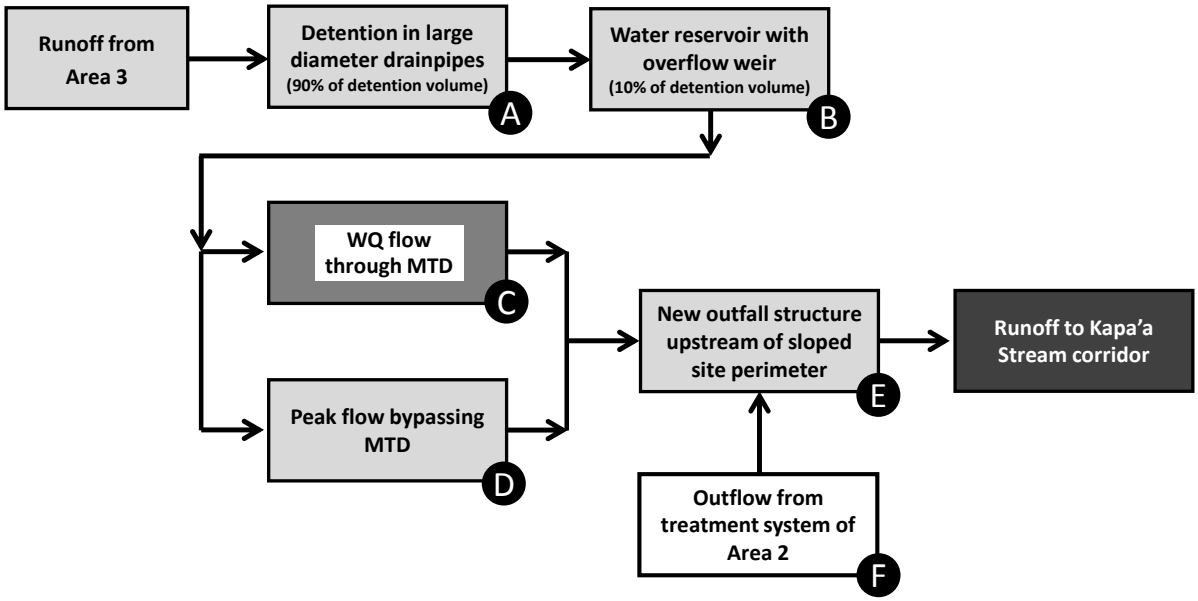


Figure 6.2.3.6: Flow diagram of the stormwater runoff from Area 3

Annotations used in Figure 6.2.3.6 and 6.2.3.7

Identifier	Description of the stormwater treatment approach
A	The runoff from Drainage area 3 enters a series of drain inlets which are connected to a system of large diameter drainpipes (max. diameter 48 inches). The large diameter drainpipes provide 90% of the required detention volume (7,500 cbft).
B	The terminus of the large diameter drainpipes is a water reservoir with a free surface and an overflow weir. The overflow weir is designed to accommodate the applicable peak flow event.
C	Under normal drainage conditions the detained storm water volume is released over a period of 24 to 36 hours. The released runoff volume flows through the manufactured treatment device (MTD), which is a filtration unit with significant pollutant removal capacity.
D	During heavy rain events the maximum detention capacity could be exceeded, and the detained runoff could overflow the weir.
E	A new and armored outfall was constructed to safely guide the runoff down the vegetated site perimeter slope.
F	The MTD unit and the new outfall were designed to accommodate the combined flow from Drainage areas 2 and 3.

Figure 6.2.3.7 shows the location of the storm water management system that serves Area 3. The identifier A indicates the detention volume contributed by the large diameter, 2,000 feet long drainpipes. The system parts with the identifiers B through F are located close together at the site perimeter.

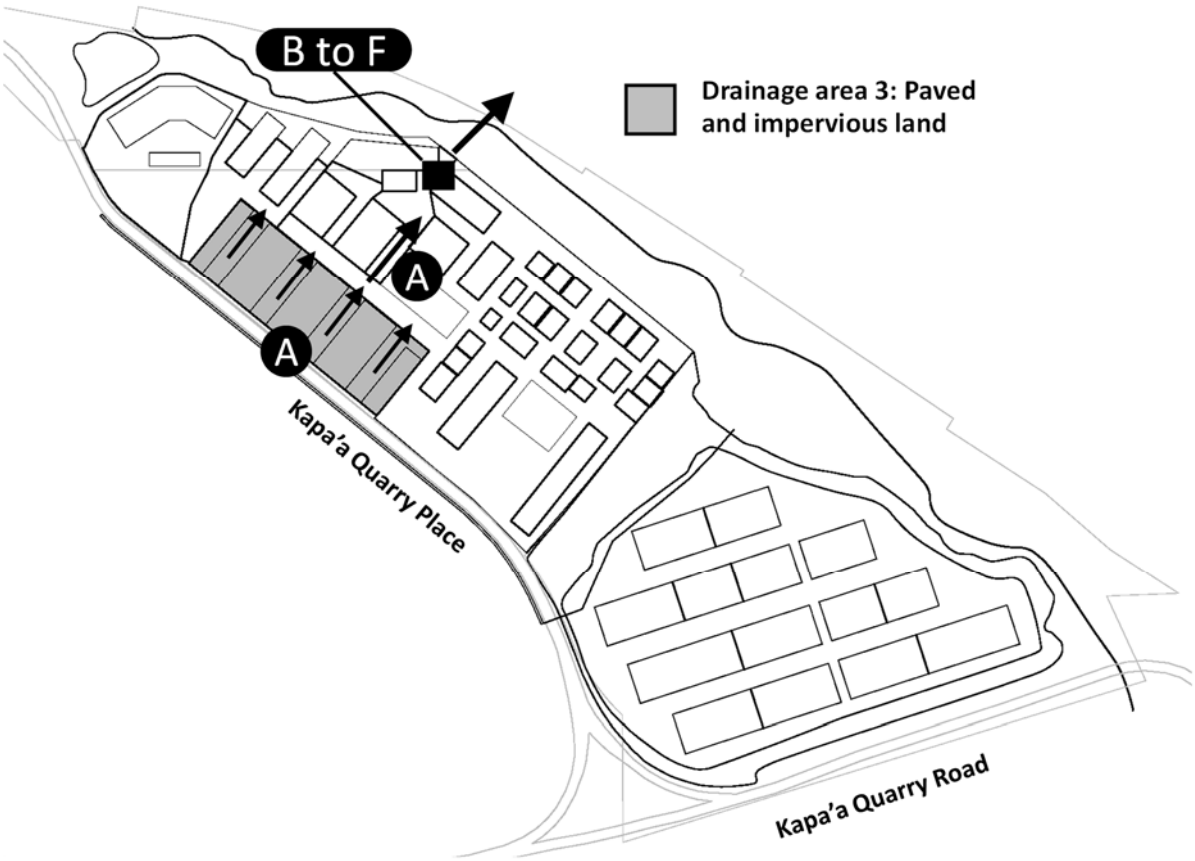


Figure 6.2.3.7: Area 3 with significant upgrades of the exiting stormwater strategies

<u>Drainage area 4 – Upper site:</u> Figures 6.2.3.8 and 6.2.3.9 illustrate the shaded portion of the full build-out project in the Upper site which will drain through an existing vegetated infiltration and detention basin. There are two drainage areas which drain to the existing infiltration basin. First the 3.3-acre paved traffic area and roof areas around and of the existing buildings 50 and 51, and second, the 1.9-acre paved traffic area around the planned buildings 24B and C.

Both areas collect surface storm water runoff and discharge it to the existing 0.75-acre infiltration and detention basin. This basin was originally built to receive runoff from an uphill quarry site. This basin no longer receives the runoff that it was designed to do and its use for the Proposed Action was approved in the Zone Change ordinance 13-35.

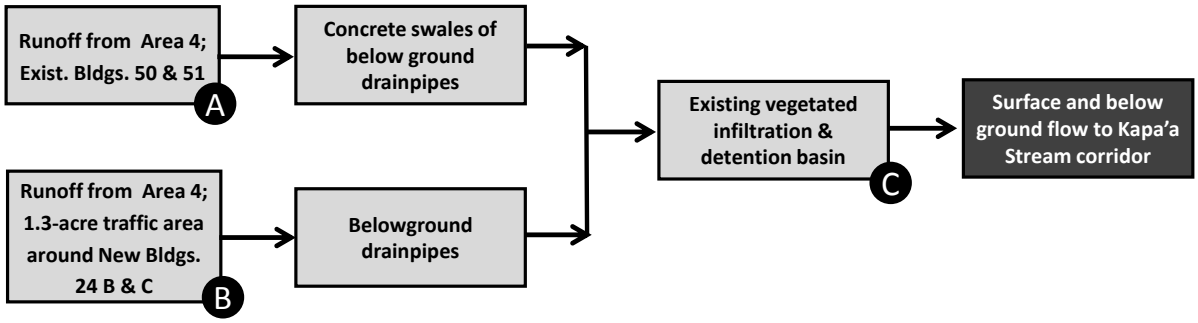


Figure 6.2.3.8: Flow diagram of the stormwater runoff from Drainage area (Area) 4 which is discharged to the existing infiltration and detention basin

Annotations used in Figure 6.2.3.8 and 6.2.3.9

Identifier	Description of the stormwater treatment approach
A	The portion (A) of Area 4 is the 3.3-acre drainage area that includes the existing building 50 and 51 and the traffic area around these 2 warehouses. The runoff flows to an existing outfall structure upstream of the existing vegetated infiltration and detention basin through a series of concrete swales and drainpipes.
B	The portion (B) of Area 4 is the 1.3-acre drainage area that includes traffic area around the two planned warehouses Buildings 24 B and C. The runoff flows to an existing outfall structure upstream of the existing vegetated infiltration and detention basin through a series of underground drainpipes.
C	The 0.75-acre existing vegetated infiltration and detention basin presently receives the runoff from the 3.3-acre (A) portion of Area 4 and will receive the future surface runoff from the 1.3-acre (B) portion of Area 4. The combined runoff volume will stay below the maximum treatment capacity of the existing vegetated infiltration and detention basin.

Figure 6.2.3.9 shows the location of the storm water treatment system that serves Drainage area 4.

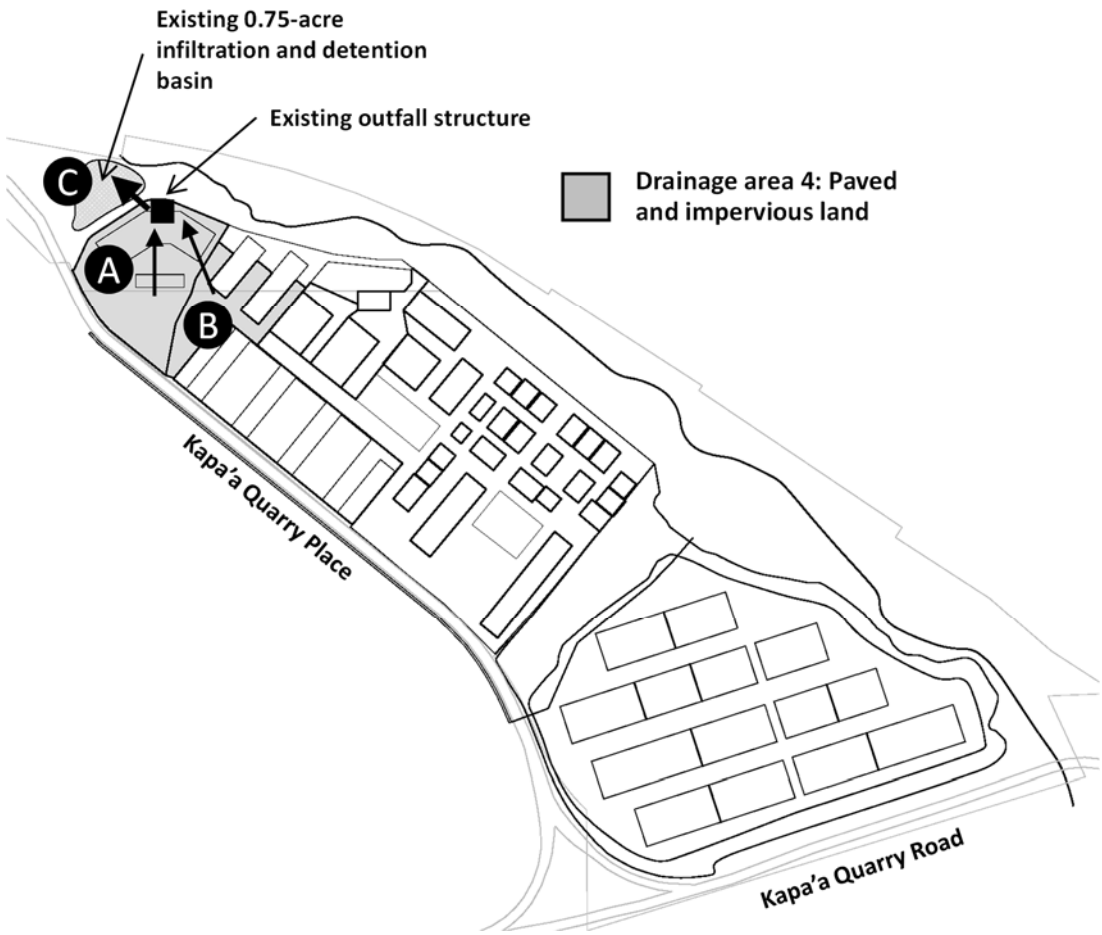


Figure 6.2.3.9: Drainage area 4 discharges to an existing 0.75-acre vegetated infiltration and detention basin

<u>Drainage area 5 – Upper site:</u> Figures 6.2.3.10 and 6.2.3.11 illustrate the shaded portion of the full build-out project in the Upper site which will drain through two existing vegetated buffer strips. There are three areas which drain to the two vegetated buffer strips. First, the 0.5-acre paved traffic area around the planned buildings 24B and C. Second, the 0.7-acre roof areas of the planned buildings 24B and C are draining to the vegetated buffer strip. Third, the roof of the new building 24 A (to be completed in December 2020) drains to the other vegetated buffer strip.

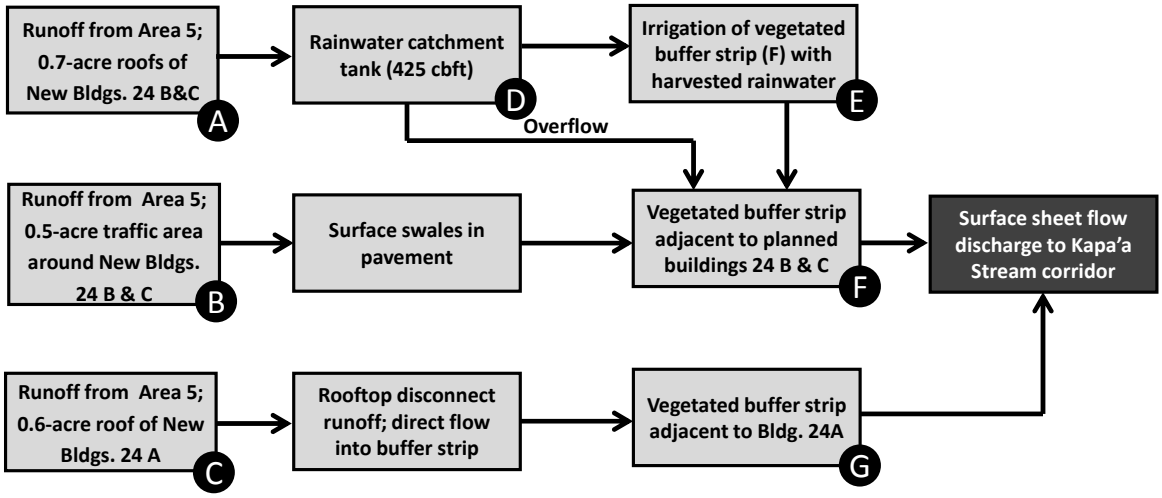


Figure 6.2.3.10: Flow diagram of the stormwater runoff from drainage area 5 which is treated by a vegetated buffer strip

Annotations used in Figure 6.2.3.10 and 6.2.3.11

Identifier	Description of the stormwater treatment approach
A	The portion (A) of Drainage area 5 is the 0.7-acre roof drainage area of the New building 24 B and C. The roof run off is disconnected from the surface runoff from the traffic areas and is conveyed to a new 425-cbft rainwater harvesting tank. The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F).
B	The portion (B) of Drainage area 5 is the drainage of the 0.5-acre traffic area around the two planned warehouses Buildings 24 B and C. The runoff flows though surface swales in the pavement to the vegetated buffer strip.
C	The portion (C) of Drainage area 5 is the drainage of the 0.6-acre roof of the new building 24A. traffic area around the two planned warehouses Buildings 24 B and C. The roof runoff flows directly into the 150-foot vegetated buffer strip section that is adjacent to building 24A.
D	The roof runoff from the planned buildings 24 B and C is disconnected from the traffic area runoff and flows directly into a 425-cbft rainwater catchment tank. The overflow of the irrigation tank is conveyed through the vegetated buffer strip.
E	The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F) which is located adjacent to the planned buildings 24 B and C (F)
F	The 1,500-sqft vegetated buffer strip is located adjacent to the planned buildings 24B and C . It receives the combined runoff from the portions (A) and (B) of Area 5.
G	The 1,000-sqft vegetated buffer strip is located adjacent to the planned buildings 24A. The buffer strip receives the roof runoff of Bldg. 24A.

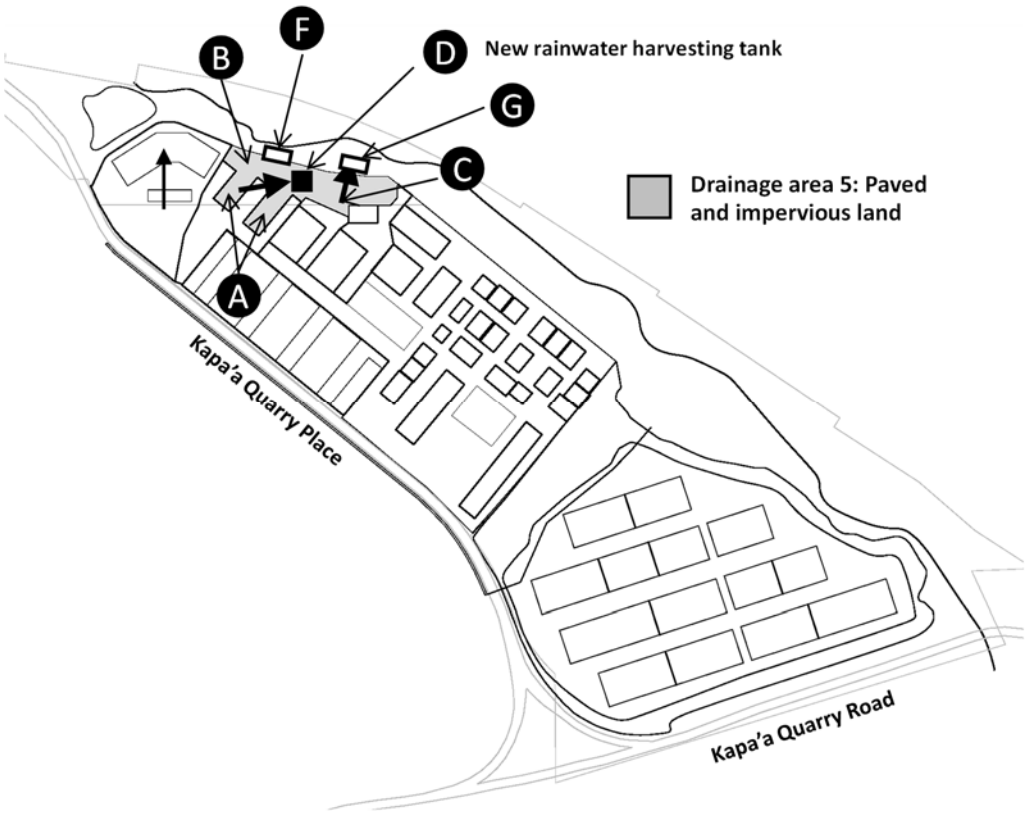


Figure 6.2.3.11: Drainage area 5 drains towards two vegetated buffer strips upstream of the site perimeter

Drainage Area 6 - Lower site: Figures 6.2.3.12 and 6.2.3.13 illustrate the shaded area of the full build-out project in the Lower site. The Lower site itself is divided into ~~3~~ 4 separate drainage area, each of which has its own discharge (outfall) to the Kapa'a Stream corridor. By using four ~~three~~ outfall structures instead of one the discharge is more evenly distributed along the Northern site perimeter which borders to the Kapa'a Steam corridor.

Annotations used in Figure 6.2.3.12 and 6.2.3.13

Identifier	Description of the stormwater treatment approach
A	Storm water runoff from traffic areas around the buildings and most of the building roofs will be collected by drain inlets. The drain inlets are connected to a series of below ground drainpipes. The drain inlets are equipped with screens that avoid intrusion of larger debris and finer sediments.
B	The storm water will enter drainpipes which convey the runoff towards the treatment system, which includes vegetated buffer strips, detention vaults and the MTD units. Just upstream of the vegetated buffer strip is a distribution swale which also serves as a settling basin to remove larger settables before they enter the vegetated buffers trip.
C	The vegetated buffer strips will have a minimum length of 15 feet and a width that will be selected for the specific drainage area of the Lower site. The sizing of the vegetated buffer strip area allows the flow depth and flow velocities through the vegetated strip to remain under the critical design flow rate. After the runoff flows over the vegetated buffer strip it collects in swale and flows from there to the inlets to the detention vault (D).
D	The detention vaults capacities to detain storm water runoff will be sized in accordance with the drain areas. The detention vaults will be constructed with storage modules with a high void ration. The vegetated buffer strips will be constructed above the detention vaults. The detained runoff will be released to the MTD units over a period of 24 to 36 hours. When the detention vaults have reached full capacity, the runoff bypasses the detention vaults and is conveyed to the new outfall structure (F).
E	The storm water that is released from the detention vaults over a period of 24 to 36 hours flows to the MTD unit, where it is filtered before releasing it to the Kapa' a Stream corridor.
F	One new outfall structure per drainage area of the Lower site will be constructed. A large diameter drainpipe will pass through the perimeter berm discharging the runoff to the adjacent stream corridor. An energy dissipation structure will reduce hydraulic energy as the runoff enters the stream corridor. A downstream rip-rap layer will be constructed in addition to add to the avoidance of soil erosion.
G	Rainwater from selected roofs of the buildings in the Lower site will be collected for irrigation. These roof discharges will be connected to rainwater harvesting tanks (H).
H	The harvested rainwater will be used for irrigation. The storm water that overflows is conveyed to the drainage conveyance upstream of the vegetated buffer strip inlets.
I	The harvested rainwater will be used to irrigate sections of the vegetated site perimeter buffer.
J	The harvested rainwater will be used to irrigate of the vegetated buffer strips.

Figure 6.2.3.12 shows the generic flow diagram which applies to all four ~~three~~ drainage areas of the Lower site. Figure 6.2.3.13 shows the location of the four ~~three~~ outfall structures along the site perimeter that borders to the Kapa'a Stream corridor. The location of the treatment system comprised of vegetated buffer strips, detention vaults, and MTD unit is indicated with an icon for all four ~~three~~ drainage areas. All other system components shown in the flow diagram of Figure 6.2.3.12 are at different locations within the drainage areas. The stormwater treatment and management system in the Lower site is of special importance since the Lower site is within the SMA. In addition, the runoff from the Lower occurs closer to the wetland areas than the drainage of the Upper site.

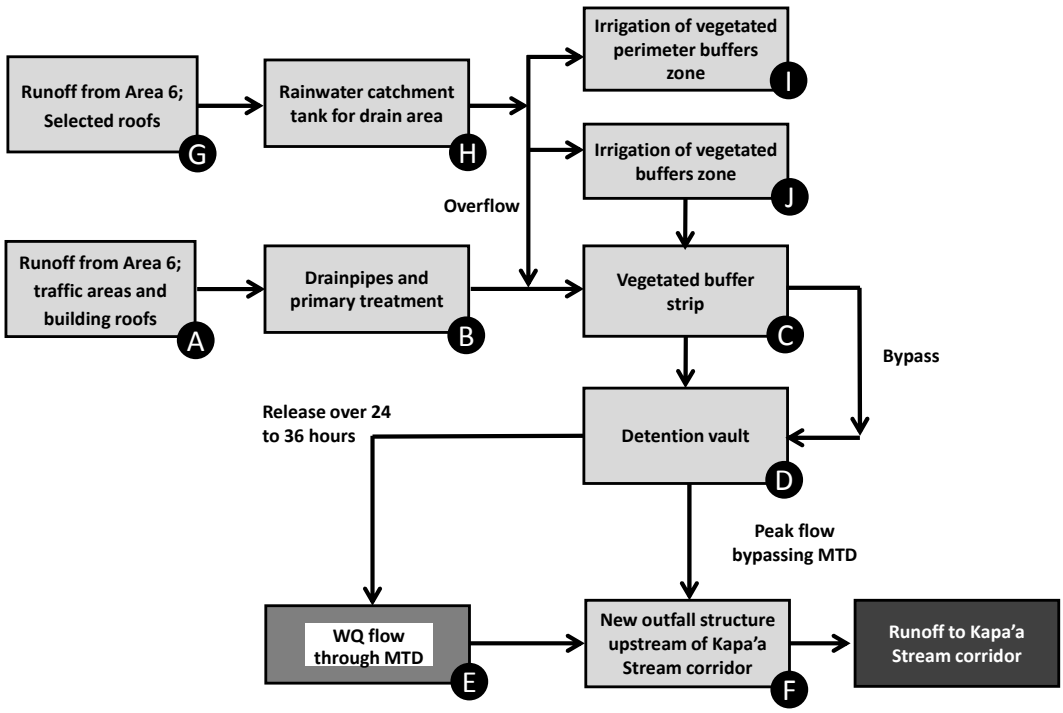


Figure 6.2.3.12: Generic flow diagram for Drainage are 6 – the storm water systems in the Lower site development

The Figure 6.2.3.13 has been changed to show four storm water treatment systems located at the Northern site perimeter. The Accepting Agency request that the Lower site be divided into four instead of three drainage areas. Appendix C describes the changes to the storm water treatment and management systems made in response to the request. Several comments received from community groups identified the "treatment systems" in Figure 6.2.3.12 as wastewater treatment systems. But they are four separate **storm water** treatment systems which remove a significant portion of pollutants from the storm water runoff before the water is released to the Kapa'a Stream corridor.

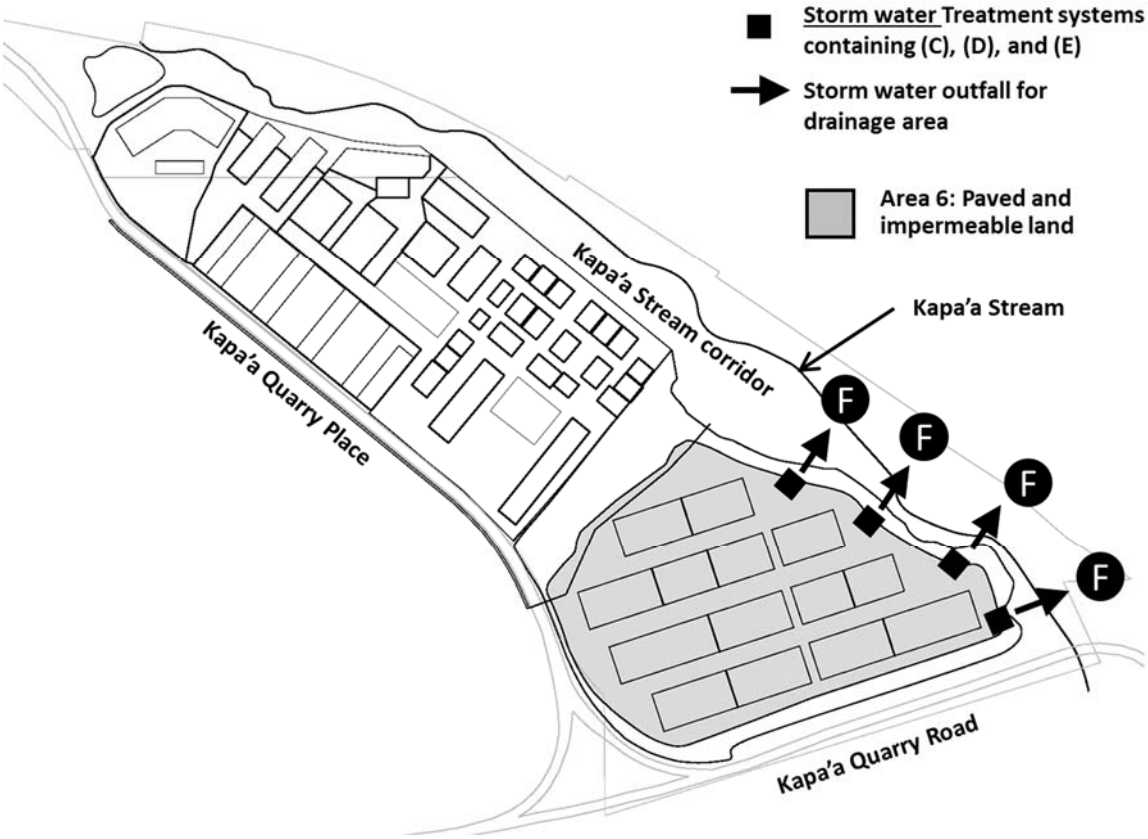


Figure 6.2.3.13: Locations of treatment systems in drainage Area 6 - the storm water systems in the Lower site development (Note: This figure has been changed)

6.2.4 Rainfall Data used for the Project Site

The 2011 Rain Atlas of Hawaii, Department of Geography, University of Hawaii (2011) was used to determine the precipitation at the projects site. Figure 6.2.4.1 illustrates the annual expected rainfall at the project site. Figure 6.2.4.2 shows the yearly distribution of the monthly rain fall. These monthly rainfall values are used in the drainage assessment and water quality treatment processes.

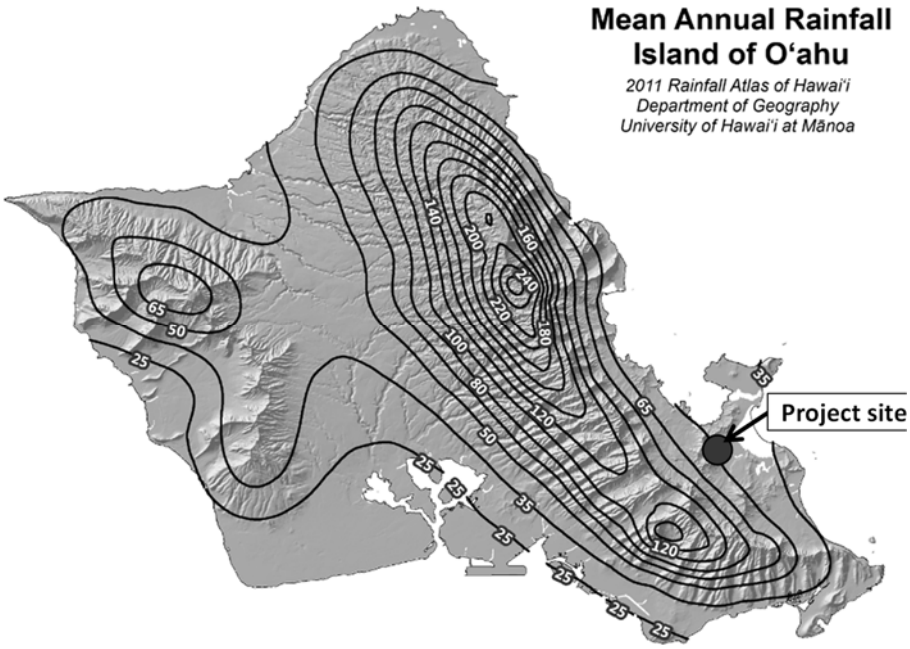


Figure 6.2.4.1: Mean annual rainfall at the project site

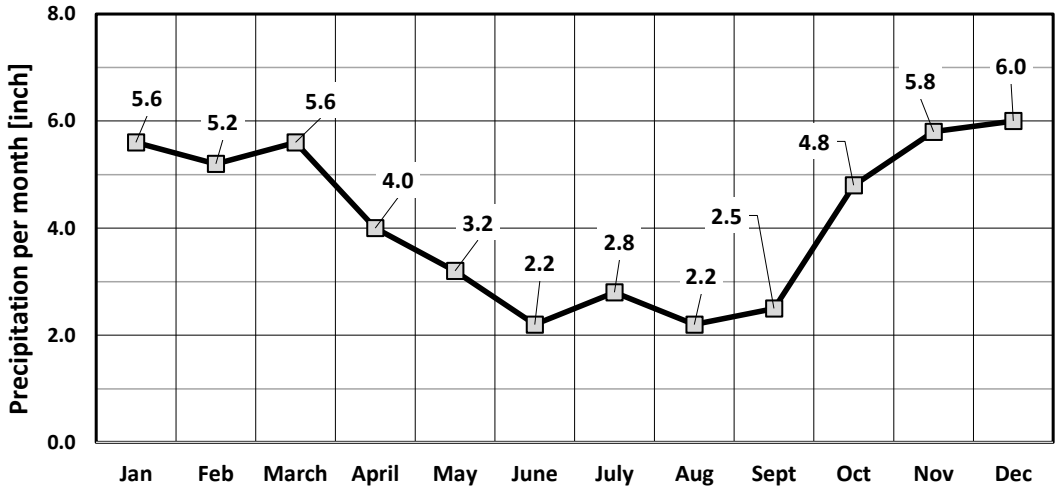


Figure 6.2.4.2: Mean monthly rainfall at the project site

6.2.5 Drainage of the Lower Site and Assessment of Site Drainage Volume

The Lower site is within the SMA area while the Upper site is not. This means that impact mitigation in the Lower site must be more thorough than in the Upper site. This is especially relevant to impact related to storm water treatment and management. The Lower site is adjacent to the lower stretches of the Kapa'a Stream corridor and closer to the important Kawainui Marsh.

This section elaborates on the proposed storm water treatment and management strategies and technologies for the Lower site. Under the storm water design the Lower site is divided into four ~~three~~ drainage areas. Each of the four ~~three~~ drainage areas has its own discharge outfall to the Kapa'a Stream corridor. Figures 6.2.5.2 through 6.2.5.4 show the four ~~three~~ drainage areas in the Lower site.

An earlier impact assessment compared the multiple outfall scenario with a single outfall scenario. It was concluded that the multiple outlet scenario has less impact on the stream bed and wetland areas adjacent to the Northern site perimeter than a single outfall discharging all the runoff from the Lower site.

Figure 6.2.5.1 shows the layout of the Lower site superimposed on the topography before the start of grading. While the topography inside the site obviously changing with the progress of grading, the topography of the adjacent Kapa'a Stream bed remains unchanged.

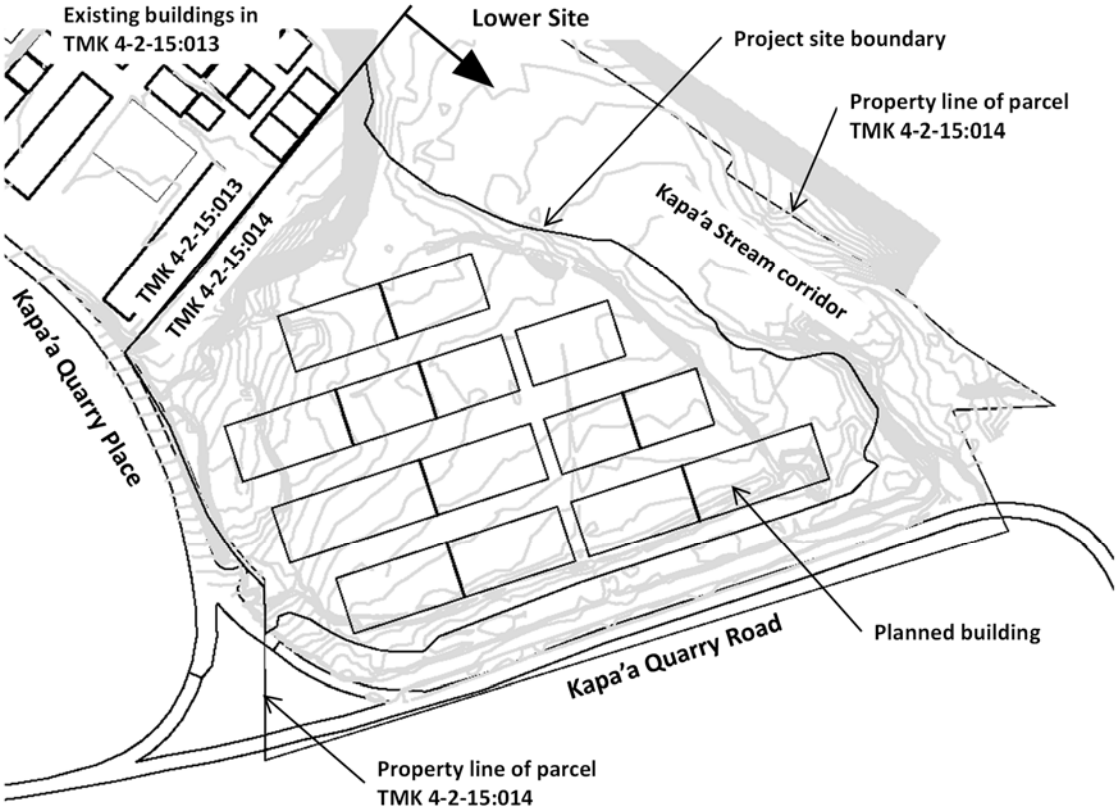


Figure 6.2.5.1: Development layout of Lower site – superimposed with topography prior to grading

Lower site – Updated Drainage area 1: Figure 6.2.5.2 shows the extent and the configuration of drainage area 1. The 5.6-acre drainage area 1 extends for about 1,100 feet in the North South direction. Drainage occurs through 8 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,450 feet with the longest distance of pipes of 850 feet to the treatment system at the

site perimeter. The approximately 200-foot belowground detention vault and the above vegetated buffer strip with the same width ~~length~~ are located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.3 and 3.3 acres, respectively.

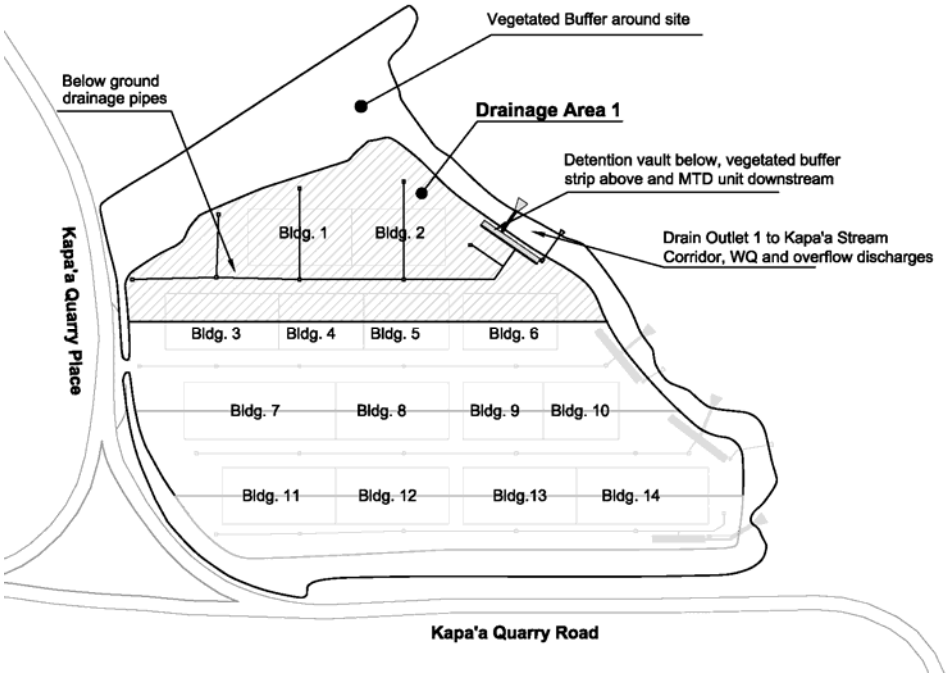


Figure 6.2.5.2: Drainage area 1 of the Lower site

This is a New image, refer to Appendix C

Lower site – Updated Drainage area 2: Figure 6.2.5.3 shows the extent and the configuration of drainage area 2. The 4.7-acre drainage area 2 extends for about 1,200 feet in the North South direction. Drainage occurs through 6 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,000 feet with the longest distance of pipes of 950 feet to the treatment system at the site perimeter. The approximately 140-foot belowground detention vault and the above vegetated buffer strip with the same width ~~length~~ is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.3 and 2.4 acres, respectively.

Lower site – Updated Drainage area 3: Figure 6.2.5.3 shows the extent and the configuration of drainage area 3. The 5-acre drainage area 3 extends for about 1,300 feet in the North South direction. Drainage occurs through 11 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,000 feet with the longest distance of pipes of 950 feet to the treatment system at the site perimeter. The approximately 160-foot belowground detention vault and the above vegetated buffer strip with the same length is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.6 and 2.4 acres, respectively.

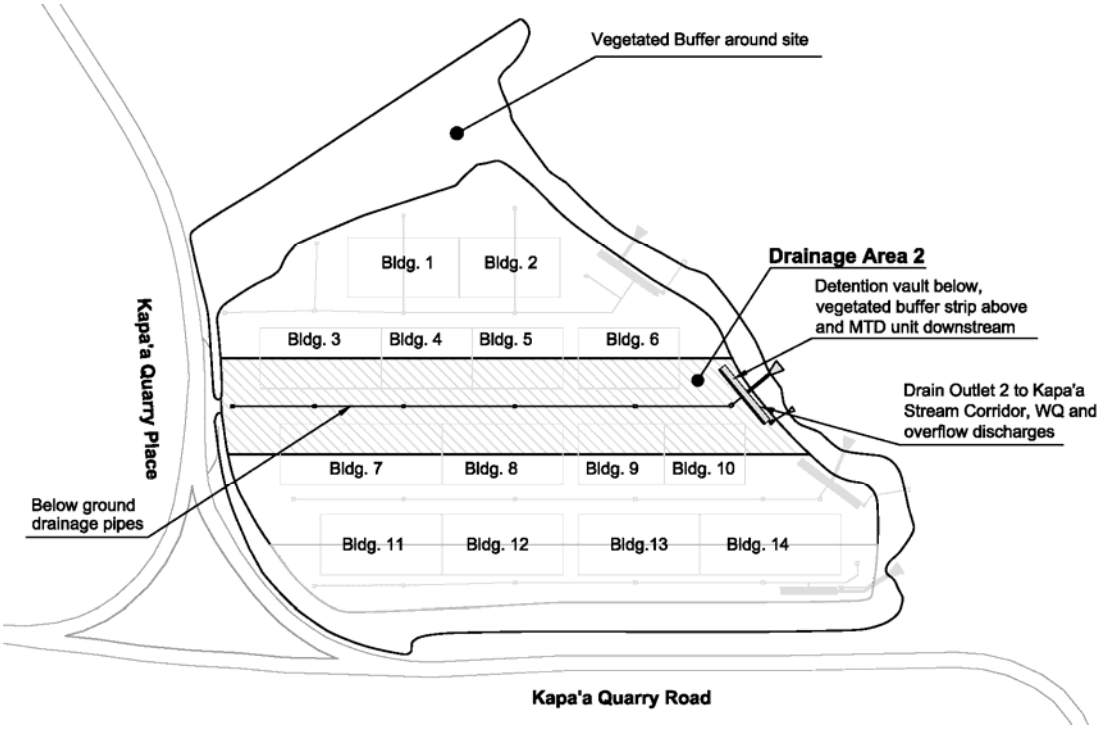


Figure 6.2.5.3: Drainage are 2 of the Lower site This is a New image, refer to Appendix C

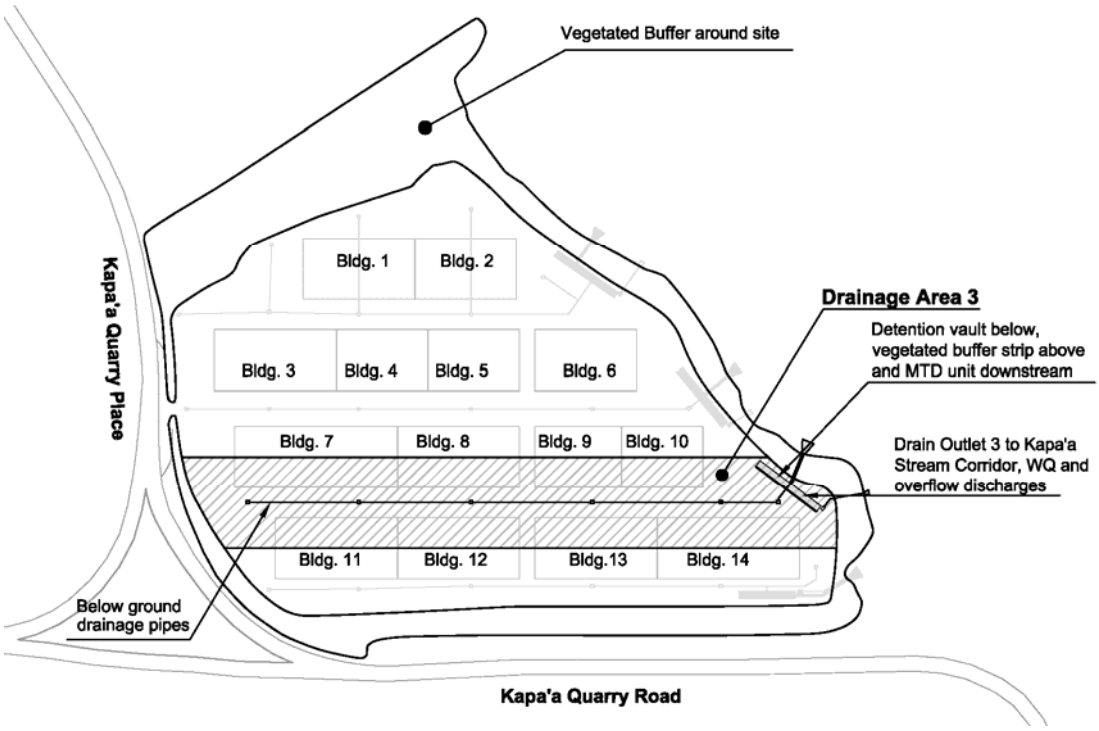


Figure 6.2.5.4: Drainage are 3 of the Lower site This is a New image, refer to Appendix C

Lower site – Updated Drainage area 4: New Figure 6.2.5.4.B shows the extent and the configuration of drainage area 4. The 3.1-acre drainage area 3 extends for about 1,000 feet in the North South direction. Drainage occurs through 6 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 950 feet to the treatment system at the site perimeter. The approximately 120-foot belowground detention vault and the above vegetated buffer strip with the same length is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 1.4 and 1.6 acres, respectively.

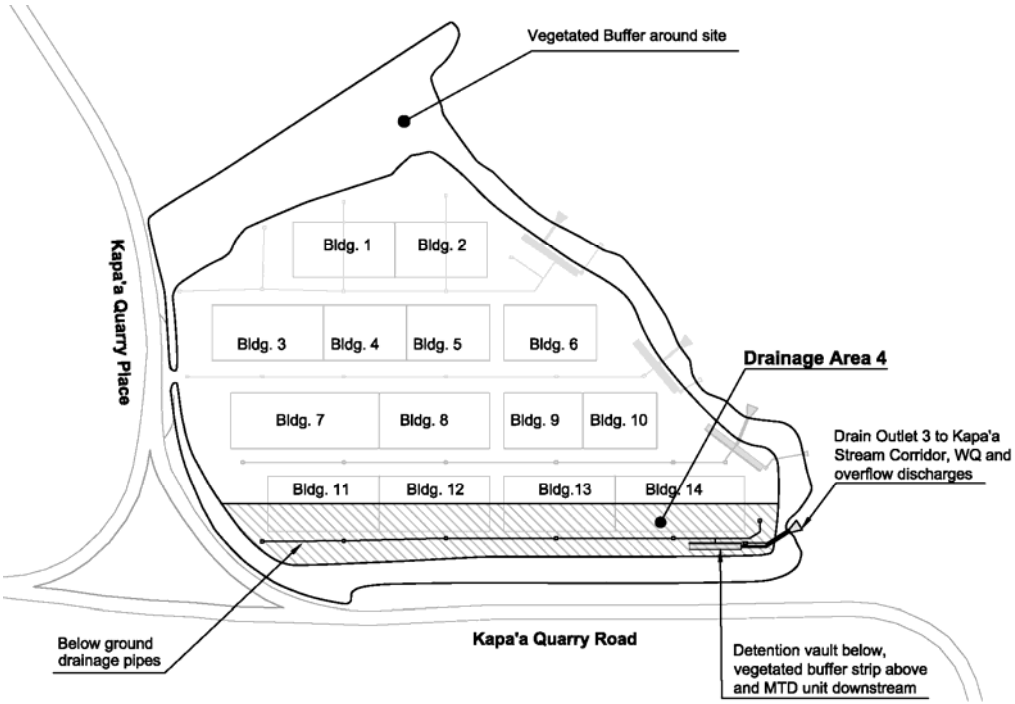


Figure 6.2.5.4.B: Drainage are 4of the Lower site This is a New image, refer to Appendix C

The Simple Method was used to estimate the runoff volume of the site and drainage areas. The difference between the pre- and post-development runoff from the site determined the volumes of the runoff must be detained for flood control.

Table 6.2.5.1 shows results of the calculations using a 10-year design storm reoccurrence interval. The required volumes of the underground detention vaults are determined as 11,400, 9,600, 10,300 and 6,400 cbft for the drainage areas 1,2,3 and 4, respectively. As requested by the Accepting Agency, the volumes of the detention vaults were increased. Appendix C describes the procedure of applying an amplification factor to the required detention vault volumes to arrive at the selected detention vault sizes for the four drainage areas.

The detention vaults will be built from a large number of drainage modules with a high void ratio of 98%. The resulting lengths of the detention vaults are 200, 140 and 300 cbft for the drainage areas 1,2 and 3, respectively. The vegetated buffer strips will be built above detention vaults and the buffer strips will have the same overall widths.

Table 6.2.5.1: Calculation results of the drainage, total runoff volume and detention volume ; This is a New Table, refer to Appendix C

Runoff calculations:	Units	**Drain area 1**	**Drain area 2**	**Drain area 3**	**Drain area 4**
Detention basin calculation					
size of project area	acres	5.6	4.7	5.0	3.1
10 year storm event	inch	2.5	2.5	2.5	2.5
Percentage of impervious area		100%	100%	100%	100%
Pre development:					
Rv for runoff		73%	73%	73%	73%
Post development					
Rv for runoff		95%	95%	95%	95%
Runoff					
Pre development:	cbft	37,000	30,900	33,200	20,600
Post development	cbft	48,400	40,500	43,500	27,000
Difference (required detention)	cbft	**11,400**	**9,600**	**10,300**	**6,400**
Detention vault:					
Amplification Factor for detention volume	[-]	100%	108%	115%	120%
Selected Detention volume	cbft	**11,400**	**10,400**	**11,800**	**7,700**
Preliminary dimensions: (rounded)					
Width	ft	13	13	13	12
Height	ft	6	6	6	6
Length	ft	140	140	150	110

Figure 16.2.5.5 shows the flow diagrams of the storm water runoff for the four ~~three~~ drainage areas for **pre-development** site conditions. The stormwater leaves the site as untreated runoff and enters the Kapa'a Stream Corridor as well as an existing drainage ditch along the Kapa'a Quarry Road.

Figures 6.2.5.6, 6.2.5.7 and 6.2.5.8 and the New Figure 6.2.5.8.B show the flow diagrams of the **full build-out** storm water systems for the drain areas 1 through 3 for the 10-year design storm event. The drainage runoff from each drainage area flows through a vegetated buffer strip where amounts of water pollutants are removed. Downstream of the buffer strip the runoff enters the detention vaults. The runoff captured in the detention vaults is released over a minimum period of 24 hours and flows through the MTD unit where the runoff water passes through filters. If the detention vault is filled to capacity the runoff overflows and therefore bypasses the detention vault. The overflow runoff is discharged to the Kapa'a Stream corridor.

By locating the vegetated buffer strip upstream of the detention vaults and MTDs all the runoff, including the runoff volume that bypasses the detention vault, is treated in normal operation.

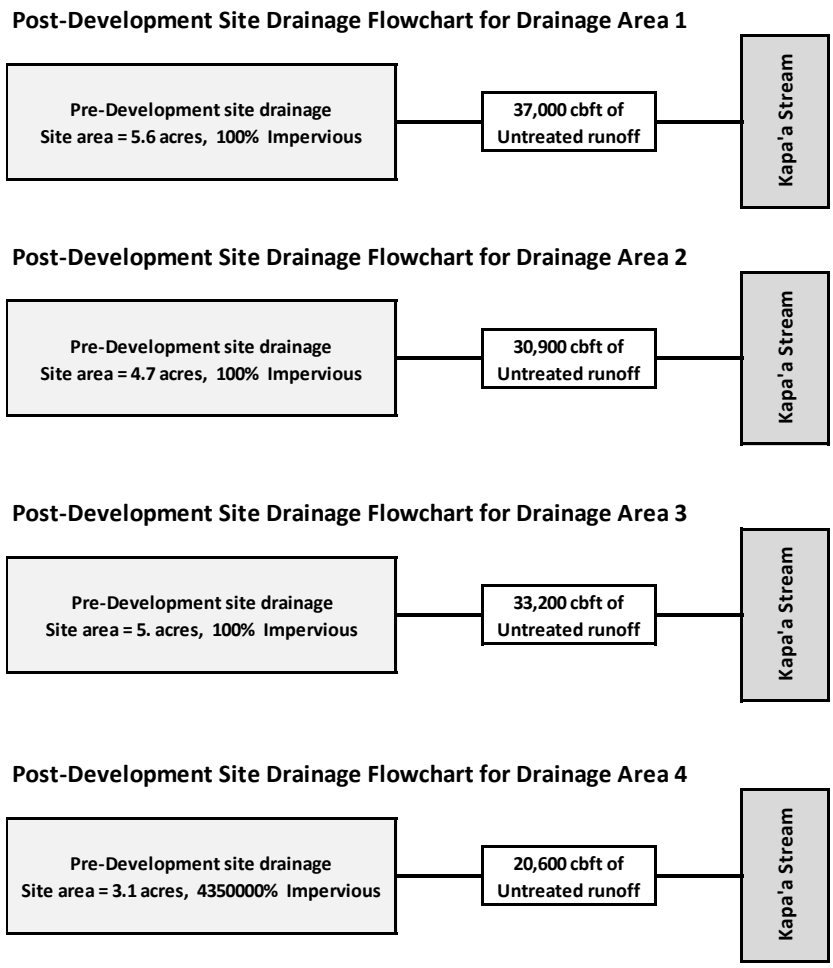


Figure 6.2.5.5: Flow diagram of pre-construction total surface runoff for four post-construction drainage areas assuming 10-year design storm event

This is a new Figure; refer to Appendix C

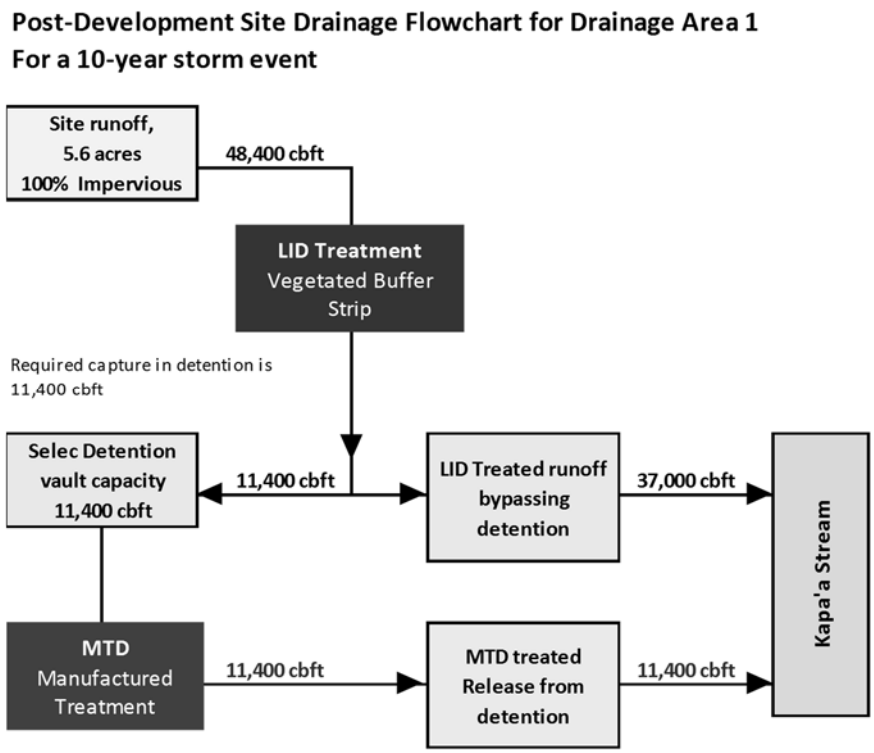


Figure 6.2.5.6**:** Flow diagram for Drainage Area 1 - Lower site

This is a new Figure; refer to Appendix C

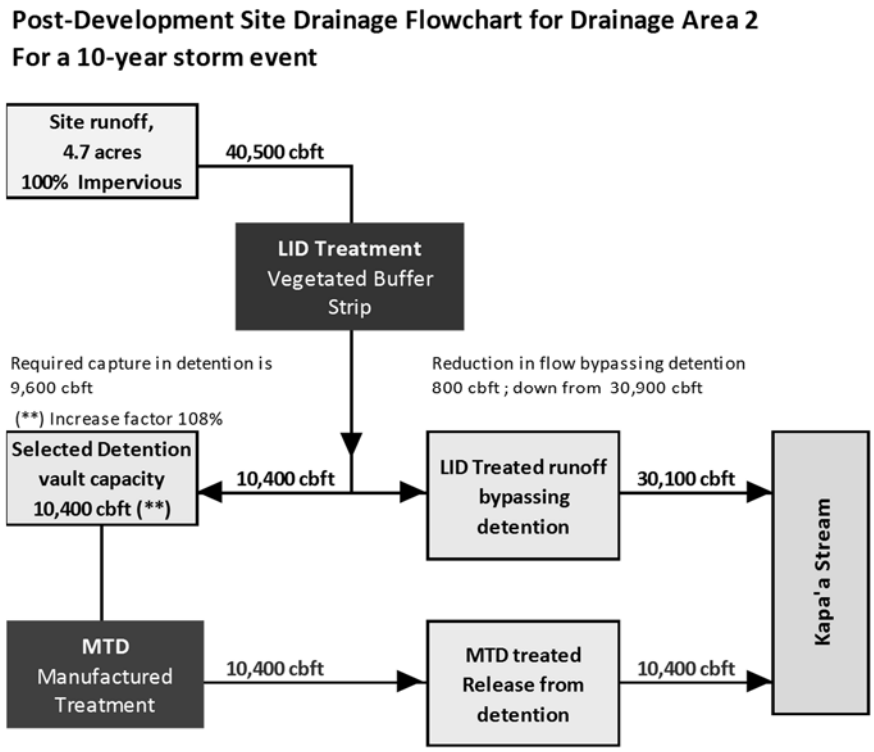


Figure 6.2.5.7: Flow diagram for Drainage Area 2 - Lower site

This is a new Figure; refer to Appendix C

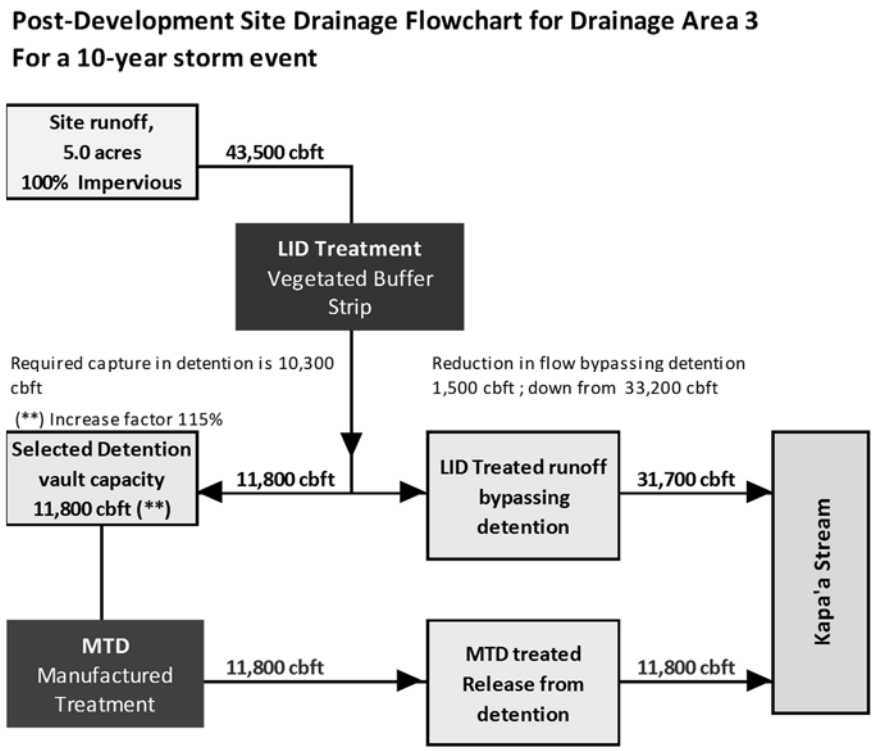


Figure 6.2.5.8**:** Flow diagram for Drainage Area 3 - Lower site

This is a new Figure; refer to Appendix C

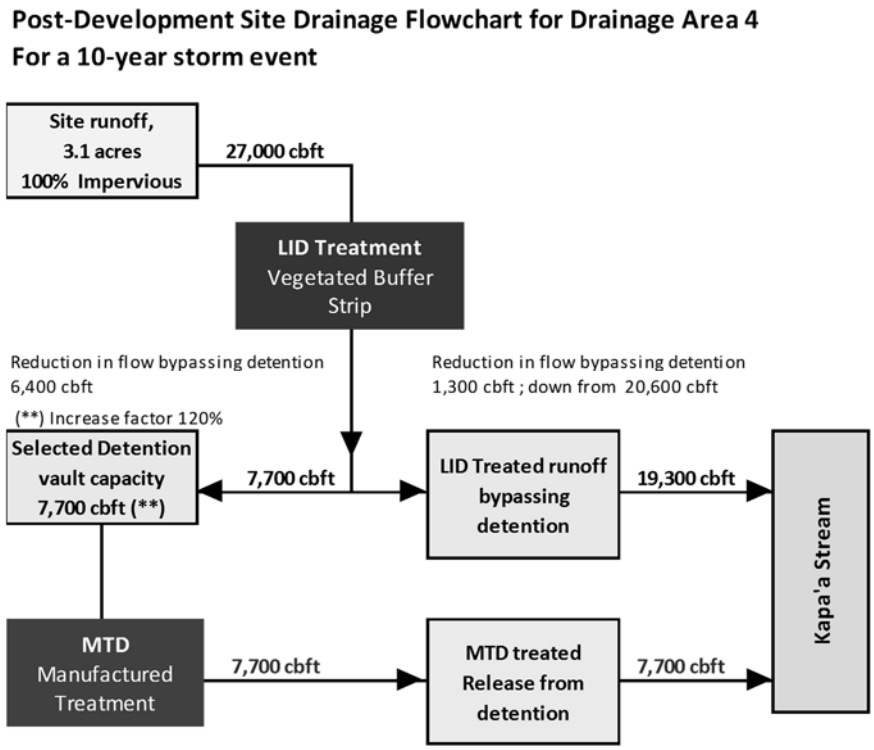


Figure 6.2.5.8.B**:** Flow diagram for Drainage Area 4 - Lower site

This is a new Figure; refer to Appendix C

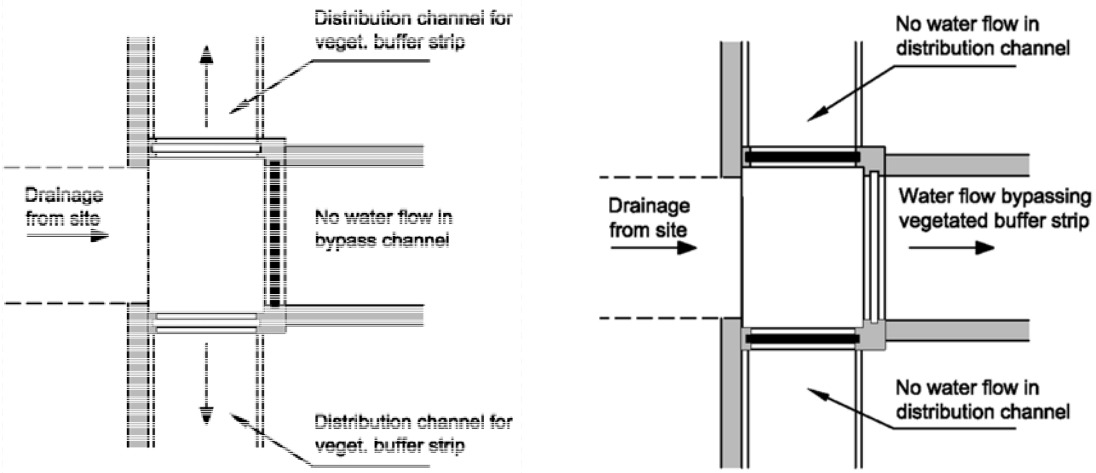
6.2.6 Details of Storm Water Systems of the Lower Site

This section describes the preliminary design of the proposed storm water treatment and management systems in the Lower site. The storm water treatment was designed to implement Low Impact Development (LID) treatment, flood control detention, multiple manufactured treatment devices (MTD) , rainwater harvesting for irrigation and controlled release of the storm water discharge to the adjacent Kapa'a Stream Corridor. The storm water treatment and management process equipment are described in the order of process, with figures referenced illustrating the process systems,

No.	Description of Storm Water Management System Component
1	**Drain inlets:** The runoff from traffic areas and building roofs are collected by multiple drain inlets inside the three drainage areas. Pre-treatment devices are used in the inlets, such as debris deflecting colleting screens, to eliminate debris and smaller floatable.
2	**Drainpipes:** The runoff collected in the drainage areas is conveyed to the site perimeter through a series of drainpipes.
3	**Distribution weir:** The distribution weir upstream of the vegetated buffer strip allows directing the runoff to the distribution swale of the vegetated buffer swale or to bypass the vegetated buffer strip, if required. At times it will be necessary to bypass the vegetated buffer strip, such as during establishing or maintaining the turf grass surface of the vegetated buffer strip.
4	**Distribution swale:** The distribution runoff water is distributed to the grassy surface of the vegetated buffer strip. The distribution swale has multiple outlets to the buffer strip to achieve even distribution.
5	**Vegetated buffer strip:** Turf grass is used as vegetation of the buffer strip. Water flow through the grass is induced by a slope of approximately 5 degrees. Irrigation water is provided by the harvested water collected in the Lower site.
6	**Collection swale:** After flowing through the vegetated buffer strip the water enters a swale that collects the discharge over the length of the vegetated swale and guiles the flow to the intakes of the detention vaults.
7	**Detention vaults:** The detention vaults are located below the vegetated buffer strip. The water enters the detention vaults through multiple inlets. The water that is released from the detention vaults flow to the MTD unit When the storage capacity of the detention vaults is reached the water in the collection swale overflows into larger diameter discharge pipes. The water in the detention vaults is released over a minimum period of 24 hours, to avoid stream erosion and associated impacts due to peak discharge outflow.

No.	Description of Storm Water Management System Component
8	**Manufactured Treatment Device (MTD):** The MTD provides water quality (WQ) flow treatment of the water detained in the detention vaults. The MTD unit receives water from the detention vaults. Since the water is released over a period of minimum 24 hours the resulting flow rates are small enough to be treated in a single MTD unit per drainage ware.
9	**WQ flow discharge:** The treated water that passes through the MTD is discharged through dedicated outfalls through the site perimeter berm. The discharge water is released to the vegetated area inside the Kapa'a Stream corridor through a riprapped area to avoid soil erosion impacts. The low discharge flow rate without peak flow rates does not necessitate a dedicated energy dissipation device.
10	**Peak flow discharge:** In heavy storm events the detention overflow of the detention vaults can attain flow rates that requires hydraulic energy dissipation upstream of the release of discharge water to the Kapa'a Stream corridor.

Figures 6.2.6.9 through 6.2.5.12 show the preliminary design of the proposed storm water treatment system in the Lower site.



A: Distribution weir directing water flow to distribution channel upstream of vegetated buffer strip

B: Distribution weir directing water flow to bypass the vegetated buffer strip

Figure 6.2.6.9: Distribution weir upstream of the vegetated buffer strip

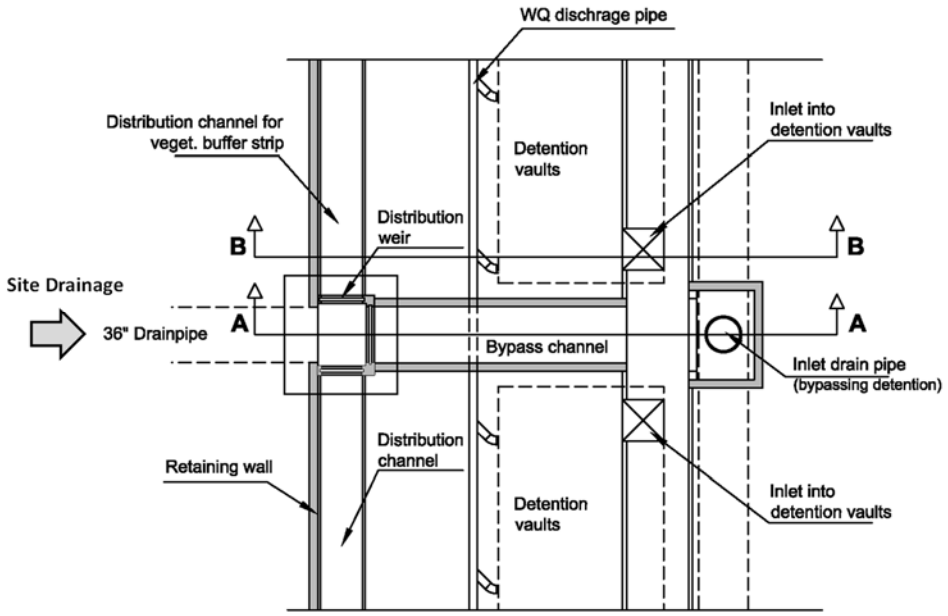


Figure 6.2.6.10: Overview of storm water treatment system components – definition of sections

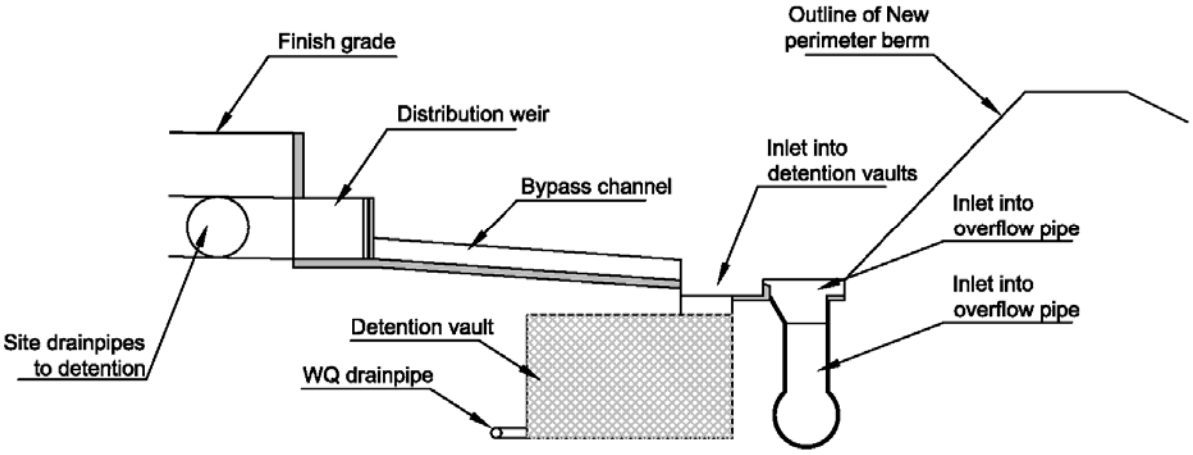


Figure 6.2.6.11: Section A-A defined in Figure I – typical cross section with bypass of vegetated buffer strip

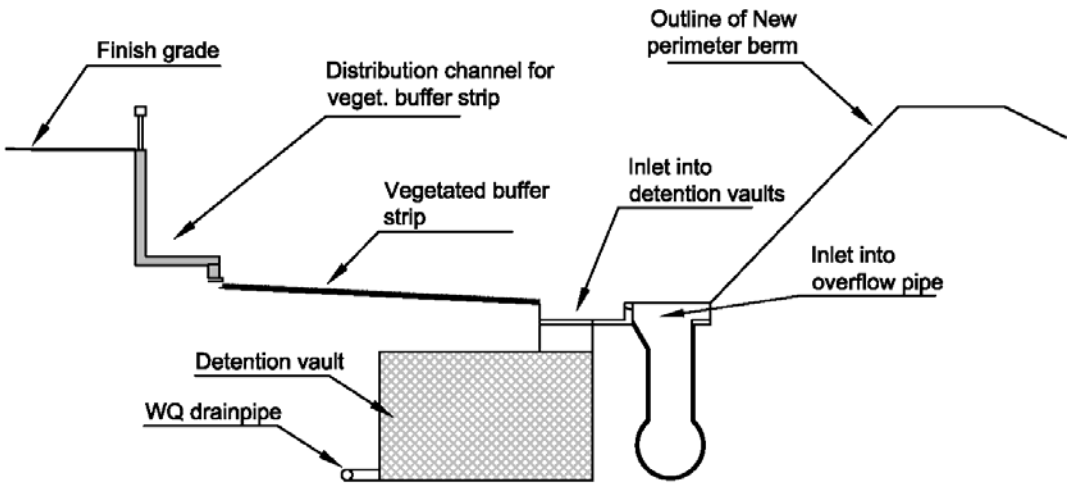


Figure 6.2.6.12: Section B-B defined in Figure I – typical cross section with flow through the vegetated buffer strip

6.2.7 Estimate of Storm Water Quantity Bypassing the Detention Vaults

The detention vaults were sized to accommodate about 23% of the 10-year storm event. This 23% portion of the estimated runoff was the difference between the pre- and post-development, considering the effect that the conversion of the site to impervious surface has on the amount off runoff. While the consideration of the peak flow event is important for the sizing of the detention vaults, the overflowing of the detention vaults in normal operation is of equal importance.

For the estimation of the frequency and intensity of overflowing, a probabilistic numeric model was developed to determine missing mean daily precipitation data at the project site based on monthly precipitation and number of rain days. The mean daily rain fall intensity is needed to estimate how much rainfall occurs at the project and how much of the resulting runoff can be captures and detained in the detention vaults.

To develop representative daily precipitation, the model predicted mean monthly rainfall intensity was taken from the Rain Atlas of Hawaii and combined with the recorded mean days with rainfall in the Kailua area. A random distribution of expected days with resulting rainfall intensity was normalized to yield the expected monthly rainfall intensity. This yielded a daily distribution of expected precipitation with the correct total rain fall intensity for the month. For the model, the release flow from the detention vaults was assumed to empty the detention volumes within the 24-hour duration of the day with rainfall.

The results are depicted in Figures 6.2.7.1 and 6.2.7.2. As an example, for the four ~~three~~ drainage areas Figure 6.2.7.1 shows the results for drainage area 1. Per month of the year, Figure 6.2.7.1 shows the mean values of the runoff from drainage area 1, the runoff volume detained and the volume bypassing, or overflowing the detention vaults. The results suggest that the detention vault of drainage area 1 is

only overflowing during five months of the so called "rainy season". Appendix C presents the results for all four drainage areas.

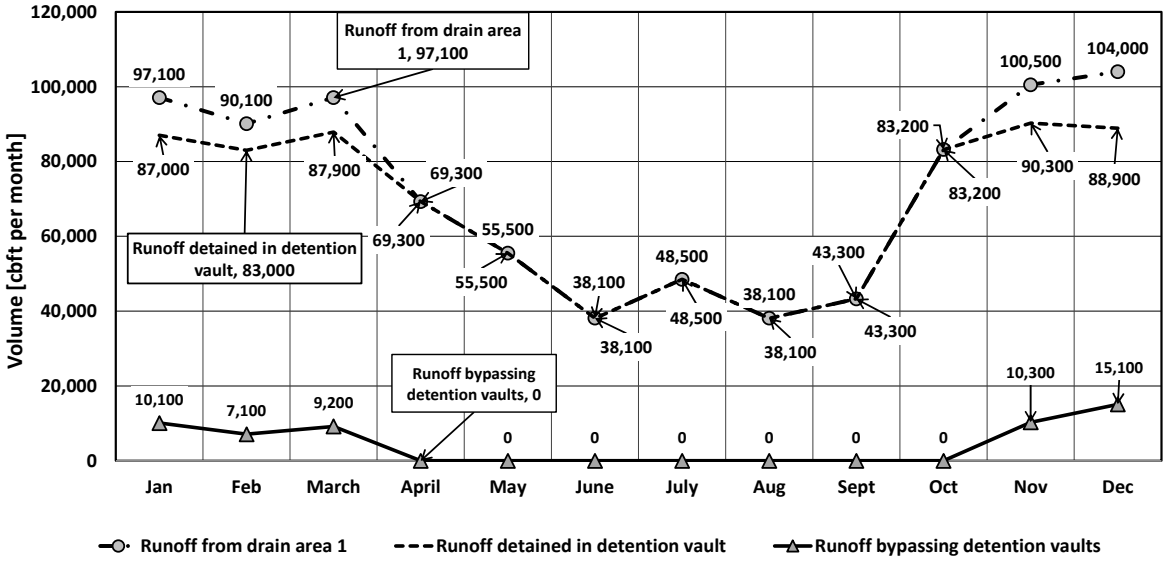


Figure 6.2.7.1: Assessment of runoff detained and overflowing the detention vaults – Values shown are for Drainage Area 1

The rainfall model suggests that the detention vaults would overflow on average on 35 days in the year, which is 10% of the time. While the frequency of the overflow is of importance, the amount of the overflow per occurrence is more important since it indicates the impact on the stream corridor.

Figure 6.2.7.2 shows a frequency distribution of the amount of expected overflow which would bypass the three detention vaults. The data indicate that the centroid of the frequency distribution is within the range of 1,000 to 2,000 cbft of runoff. Normalizing the data, we can state that the mean runoff volume that overflows the detention vaults is around 1,900 cbft, or 16% of the average detention volume of 12,000 cbft.

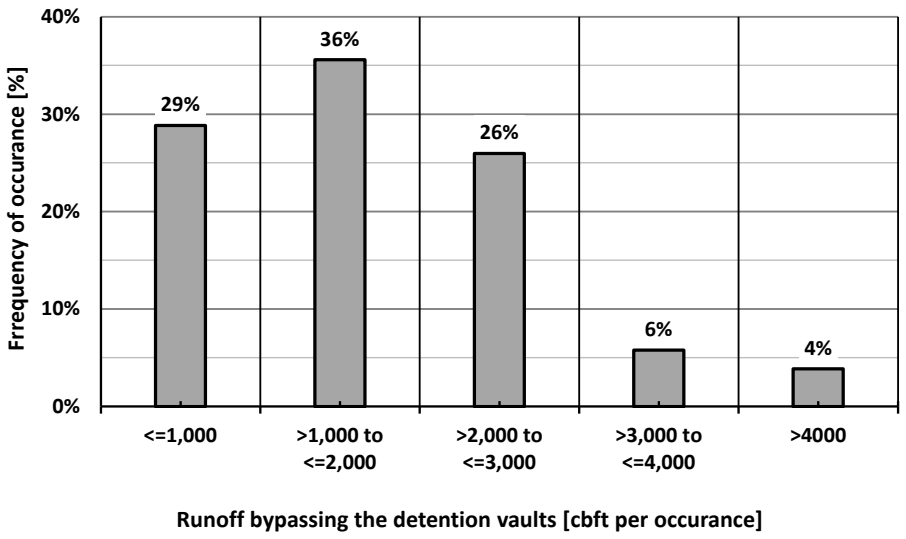


Figure 6.2.7.2: Frequency diagram of the run off colums bypassing the detention vaults

For all four ~~three~~ drainage aras of the Lower site

6.3 Full Build-out Finish Grade of the Project Site

Figure 6.3.1 shows the project site with the pre-development topography. The "pre-development" stage is defined as the time before the 2011 FEIS, about the time the topographic map depicted in Figure 6.3.1 was created.

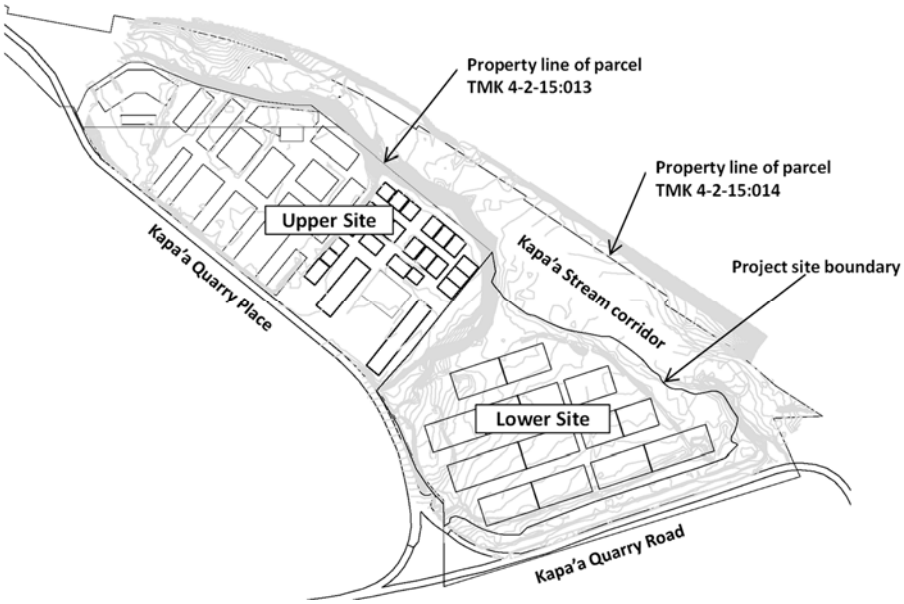
As can be seen in Figure 6.3.1, the project site is differentiated between the Upper and Lower site. At the time of the 2011 FEIS the Upper site had portions with relative flat surfaces with elevations that range between 85 and 96 feet. The Lower site had a more pronounced elevation gradient that slopes towards the North East, with elevations ranging between 70 and 20 feet. The buildings within the Lower site are overlaid with the pre-development topography.

The post-development, or Full Build-out, finish grade in the Lower site differs significantly more from the pre-development grade than in the Upper site. Figures 6.3.2 and 6.3.3 compare the topographies of the pre- and post-development grade of the Lower site in more detail.

Figure 6.3.2 shows the topography of the Lower site in 2017, after initial and limited grading was completed in the Lower site. Figure 6.3.4 shows the full build-out finish grade, with the contour line running parallel to the Kapa'a Quarry Road section directly adjacent to the Lower site. Figure 6.3.4 also indicates the location of the planned 14 warehouses in the Lower site.

Longitudinal and transvers sections were developed to compare the pre-development and the full-build-out grades. Figure 6.3.4 shows the locations of the axes of the longitudinal and transverse sections.

Figure 6.3.1: Topography of the project site



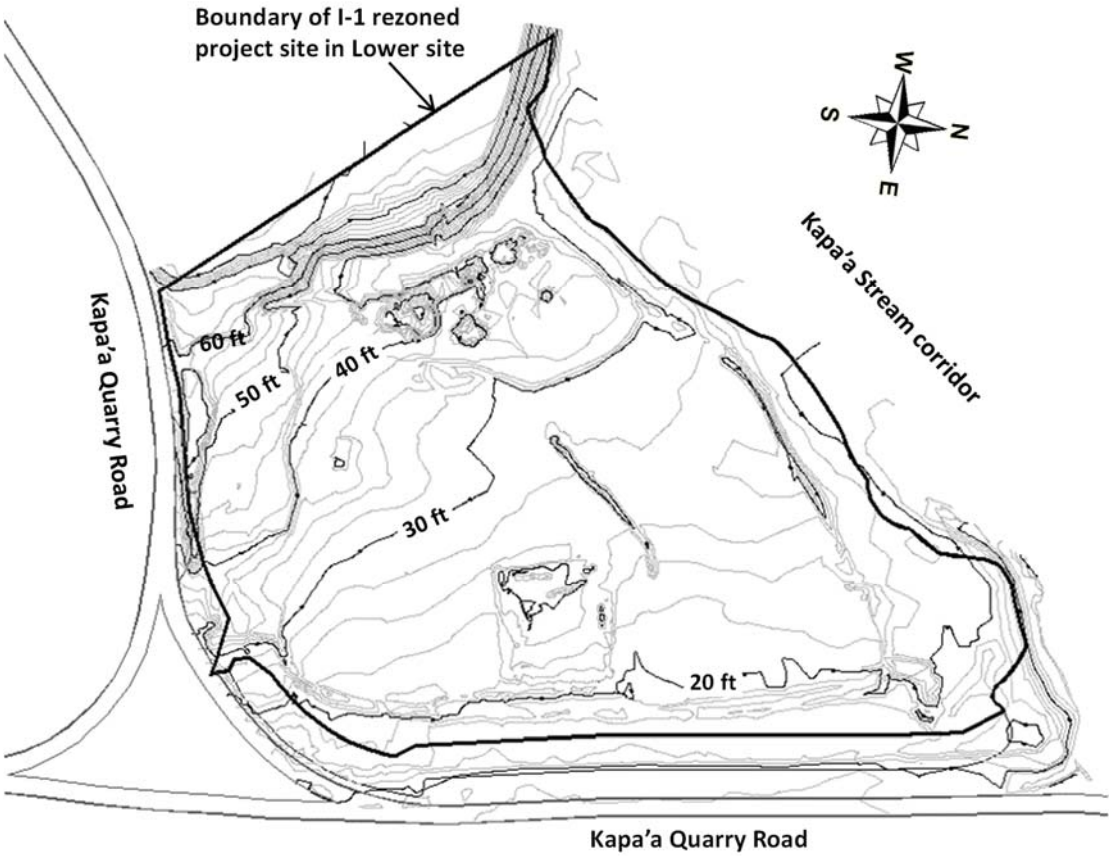


Figure 6.3.2: Lower site with grading recorded in 2017 (this Figure has been changed from the DSEIS)

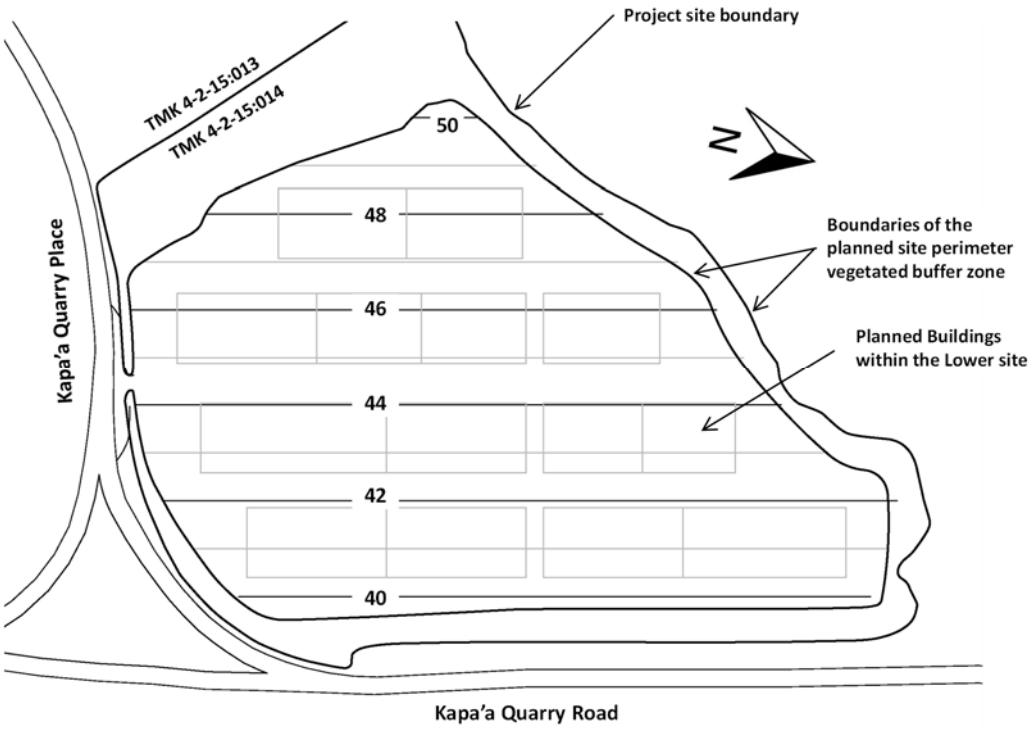


Figure 6.3.3: Lower site with proposed finish grade at full build-out

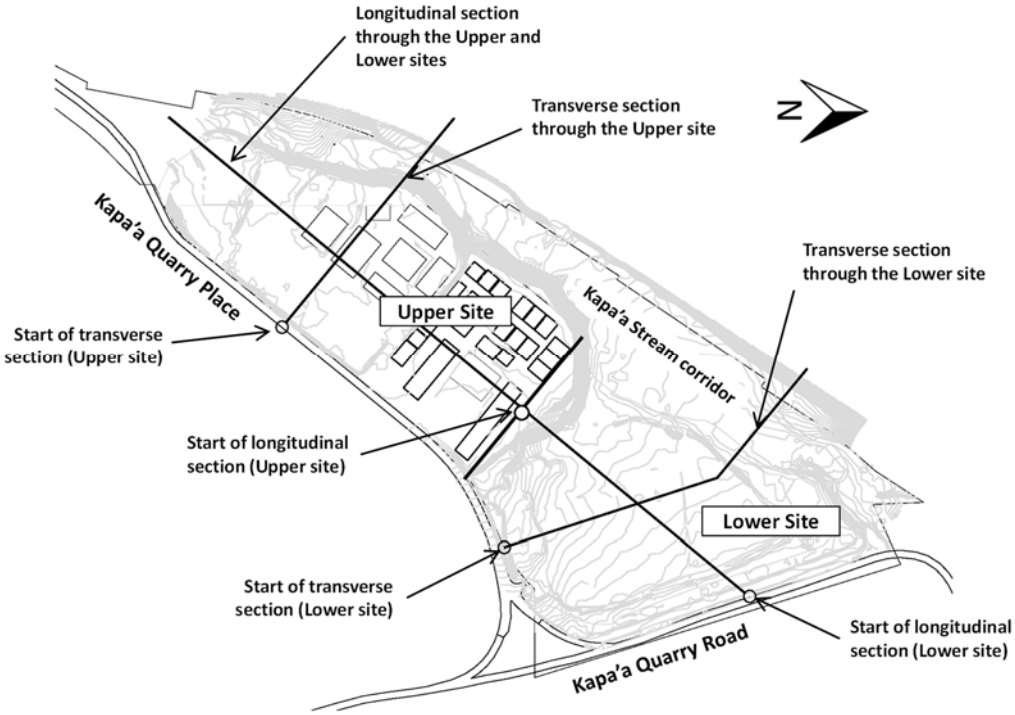


Figure 6.3.4: Locations of the axes of the longitudinal and transverse sections

The following figures illustrate the pre- and post-development (Full Build-out) topography of the project site:

Figures 6.3.5 shows the longitudinal section through the Upper and Lower sites. The elevation of the cross-section of the pre-and post-development is compared. The pre-development condition is from the time of the 2011 FEIS. Figure 6.3.5 emphasizes the different elevations of the Lower and Upper sites.

Figures 6.3.6 and 6.3.7 show the longitudinal sections through the Lower site, for the pre-development (conditions at 2011 FEIS) and the full build-out conditions. The four building cross sections indicate the planned four rows of buildings.

Figures 6.3.8 and 6.3.9 show the longitudinal sections through the Upper site, for the pre-development (conditions at 2011 FEIS) and the full build-out conditions. The building cross sections indicate the existing (E) and the planned (P) buildings.

Figures 6.3.10 through 6.3.13 show the transverse sections for the Upper and Lower transverse sections. The existing and planned buildings are indicated.

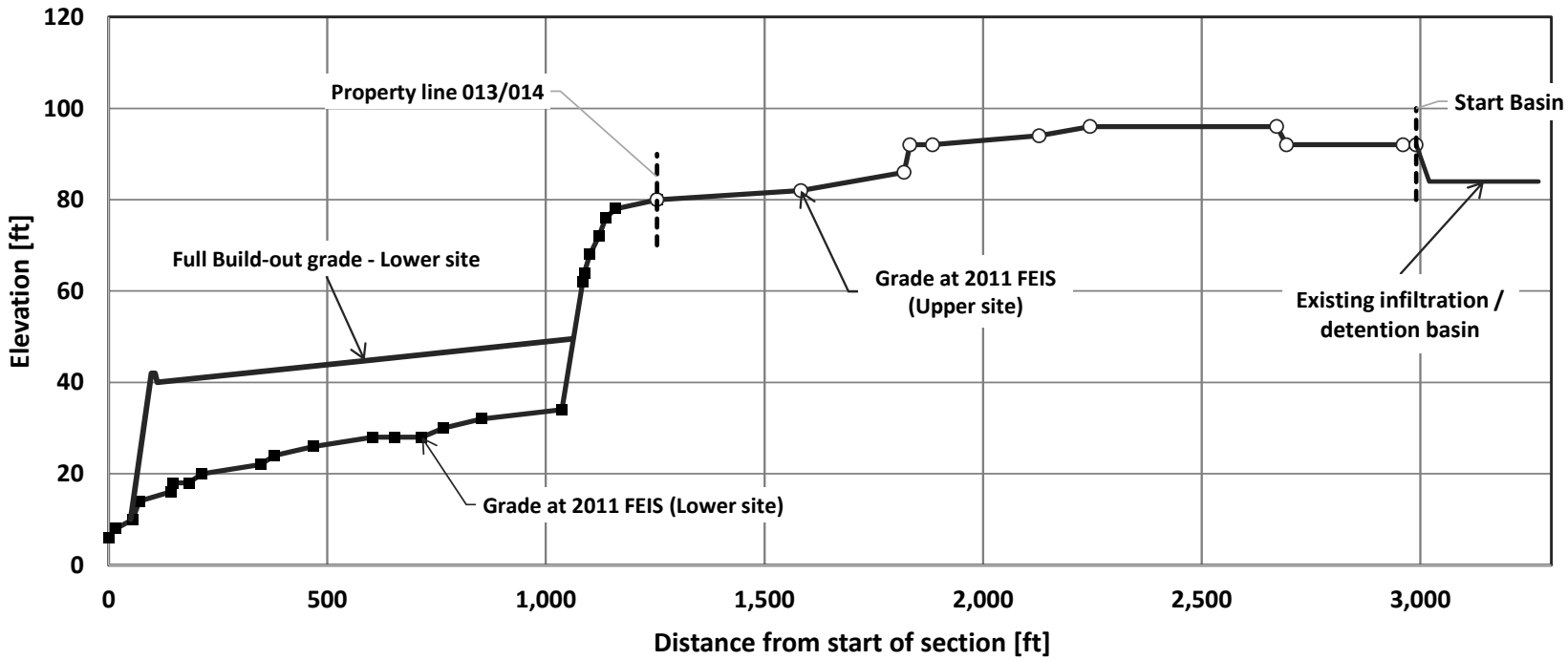


Figure 6.3.5: Longitudinal cross-section through the Upper and Lower sites- Comparison of the Pre- and Post-development

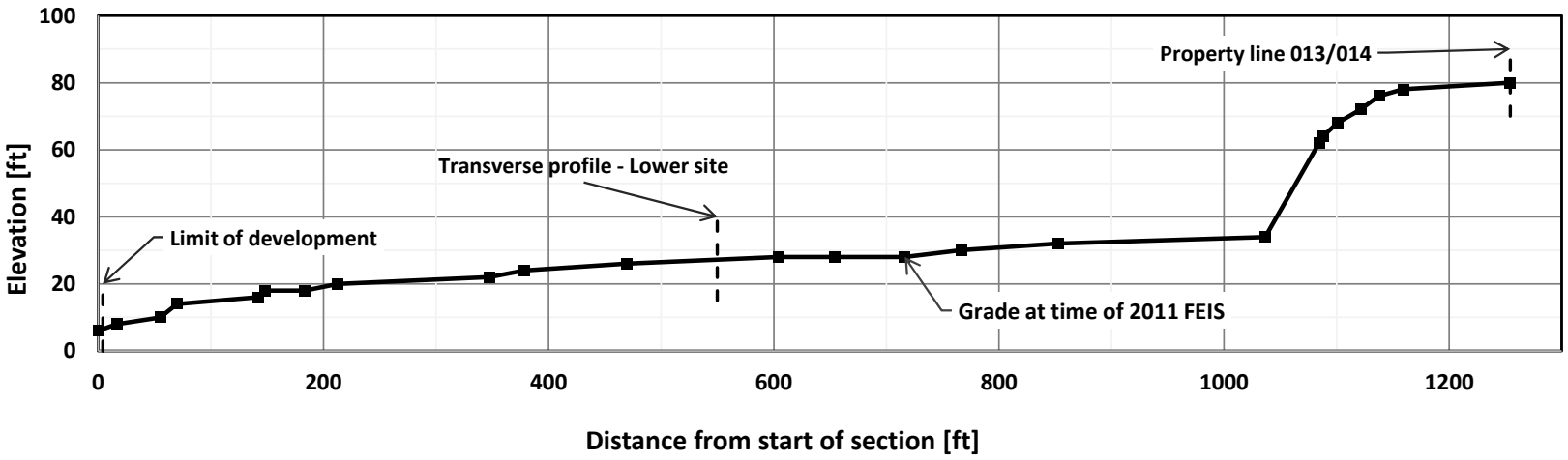


Figure 6.3.6: Longitudinal cross-section through the Lower site – Pre-development situation

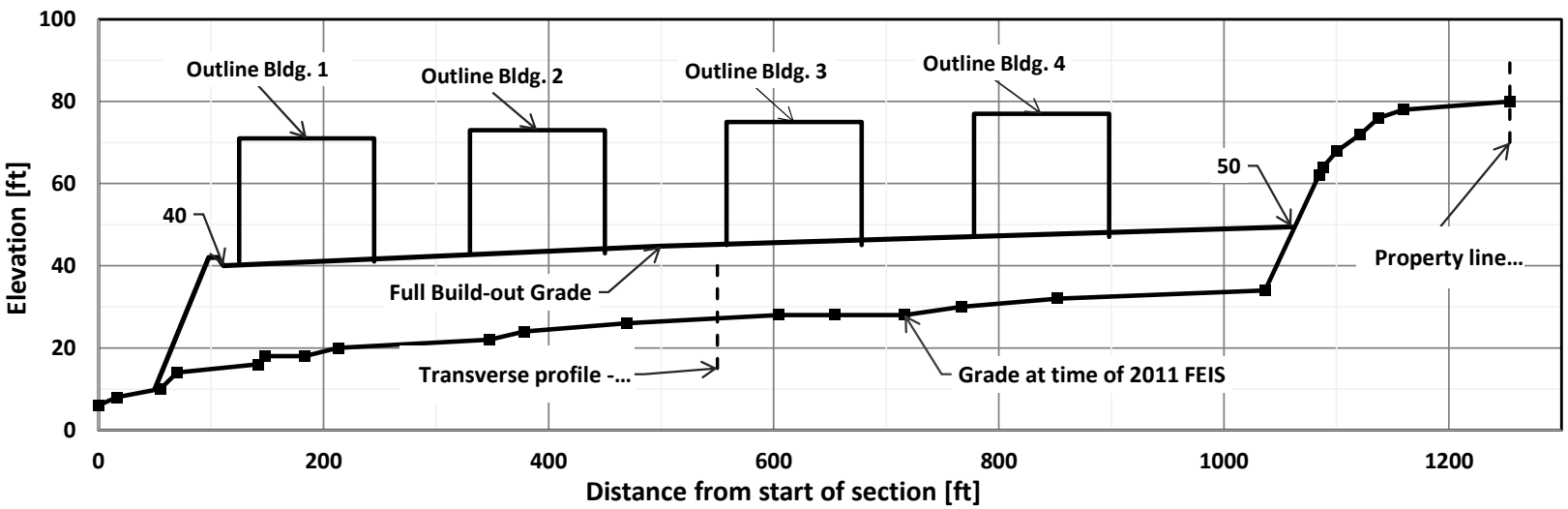


Figure 6.3.7: Longitudinal cross-section through the Lower site – Comparison of Pre-development and Post-development situation

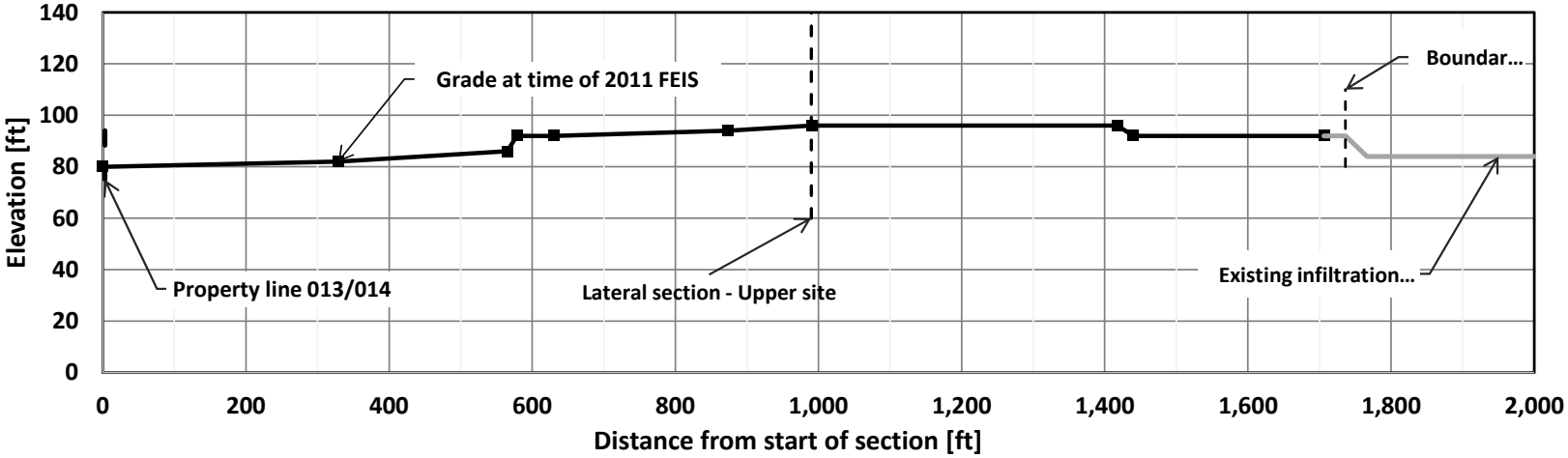


Figure 6.3.8: Longitudinal cross-section through the Upper site – Pre-development situation

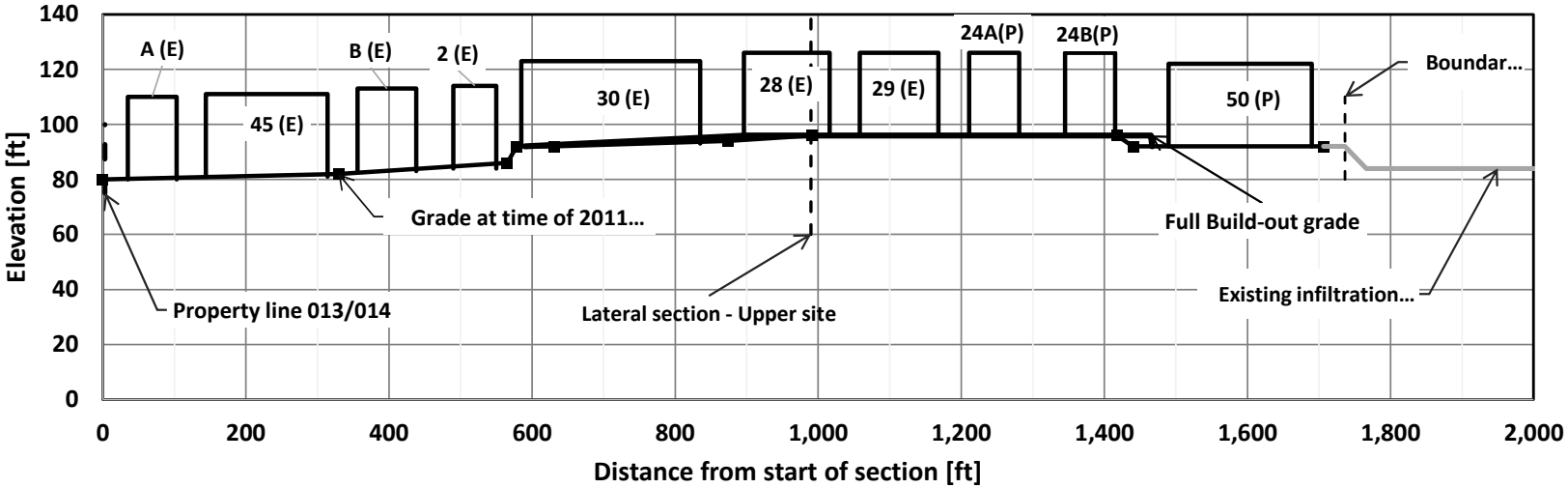


Figure 6.3.9: Longitudinal cross-section through the Upper site – Comparison of Pre-development and Post-development situation

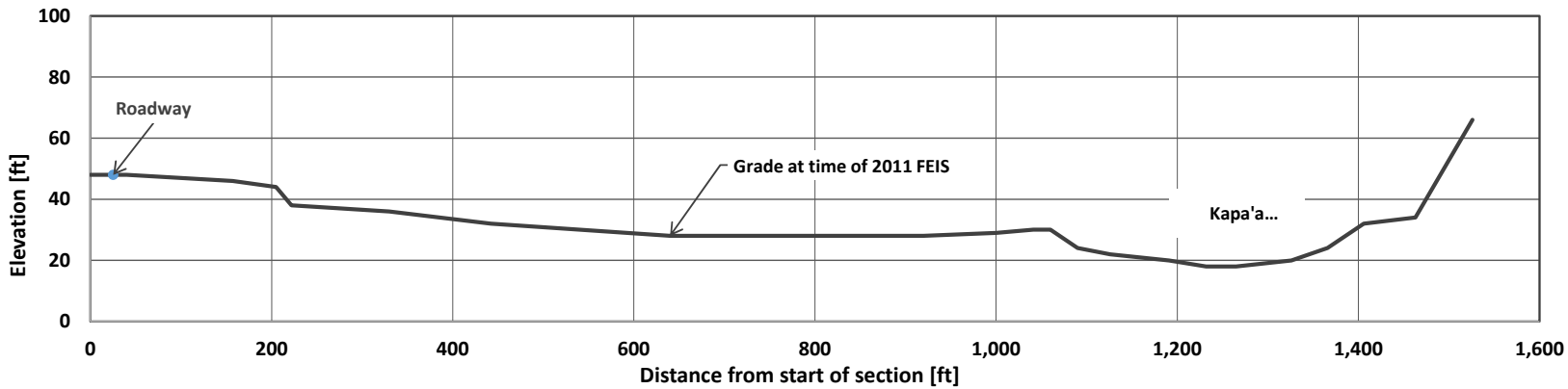


Figure 6.3.10: Transverse cross-section through the Lower site – Pre-development situation

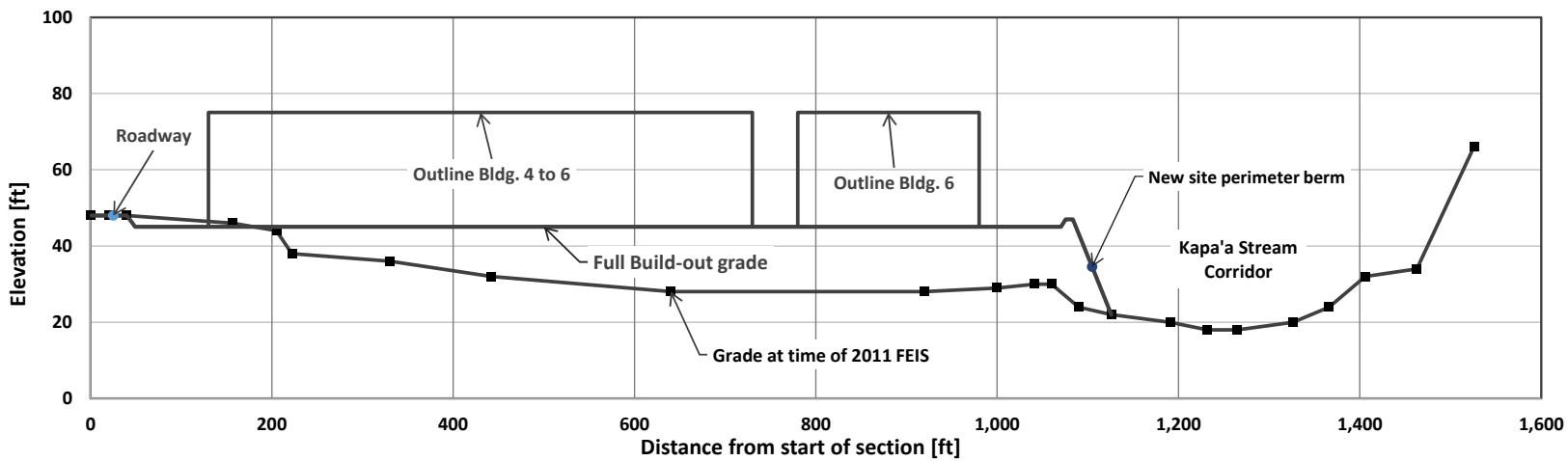


Figure 6.3.11: Transverse cross-section through the Lower site – Comparison of Pre-development and Post-development situation

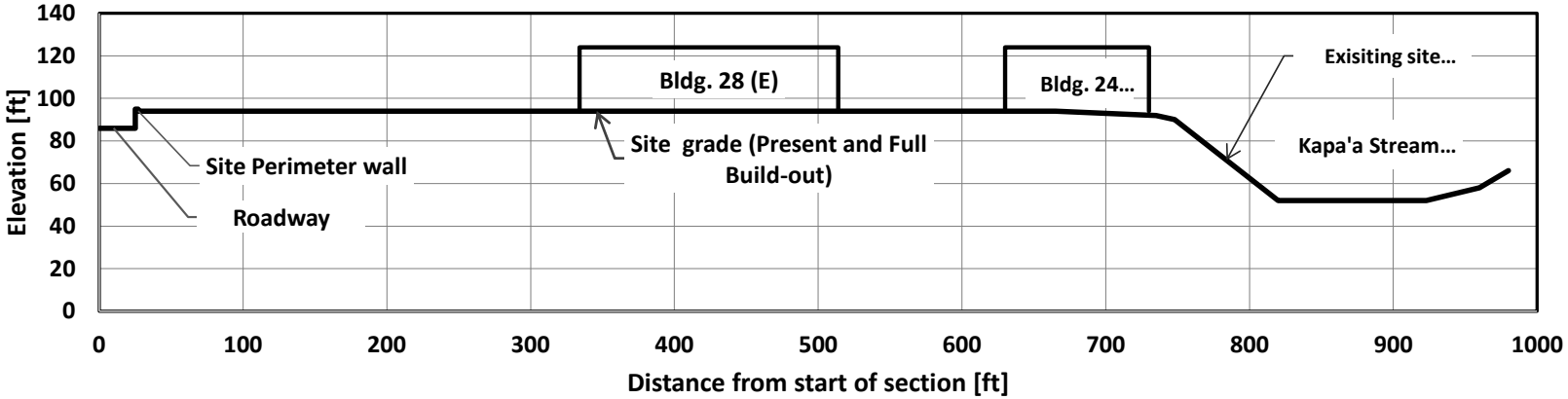


Figure 6.3.12: Transverse cross-section through the Upper site – Pre-development situation

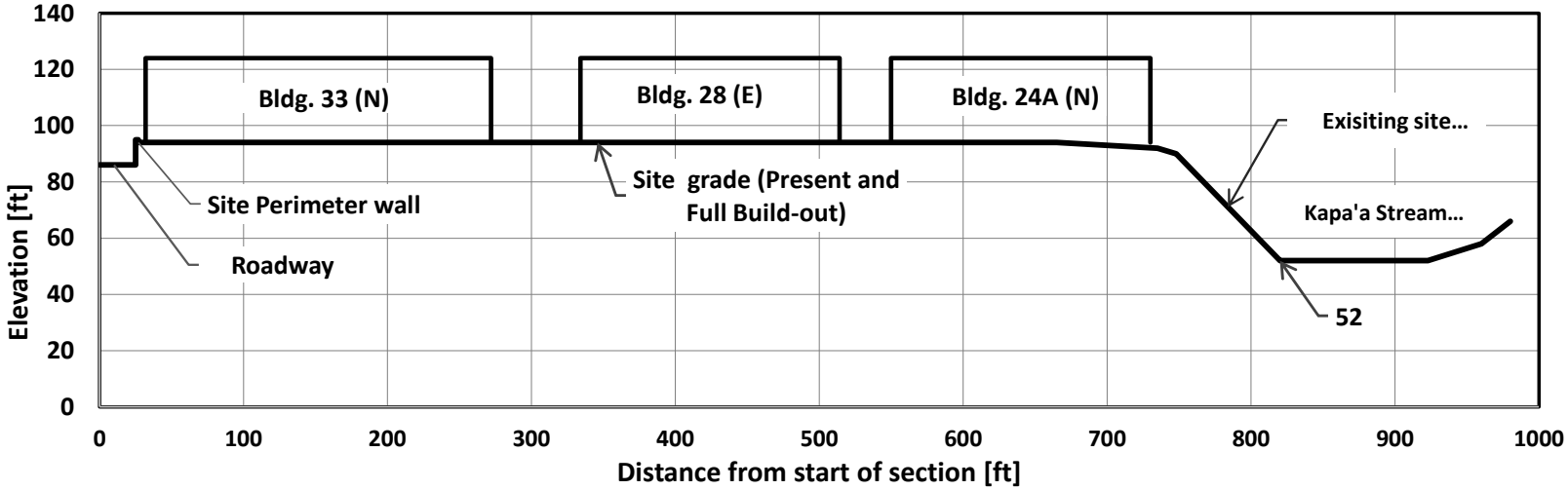


Figure 6.3.13: Transverse cross-section through the Upper site – Comparison of Pre-development and Post-development situation

6.3B Removal Efficiency of the Type of Manufactured Treatment Device Used (New Section)

This section 6.3B has been added to the DSEIS document to respond to a comment by the Accepting Agency about the removal efficiency of the type of Manufactured Treatment Device (MTD) used. This information is also presented in Appendix B of this FSEIS.

The one MTD, which is already in use at the Upper portion of the project site and the four MTDs planned for implementation in the Lower portion are filtration MTD, which remove pollutants by passing water through a membrane filter. The particular MTD used at the project site is the Bio Clean Kraken™ Filter unit. If there are changes in the type of MTD offered from different vendors, a system with equivalent treatment performance would be used.

This Kraken MTD has been approved by the DPP for use as an Alternative Compliance BMP. The approval of the DPP is based on whether the MTD has passed tests based on either of two test protocols:

- Certification in accordance with the Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE) test protocol.
- Certification in accordance with New Jersey Department of Environmental Protection (NJDEP) test protocol.

Both test protocols are widely used as the basis for local certification of MTDs.

The Kraken MTD Filter unit utilizes membrane filtration, this ensures a high level of removal for not only TSS, but also metals, trash, nutrients, and hydrocarbons. The Kraken MTD Filter unit has received NJDEP and TAPE certifications for TSS removal rate at 80% and 89%, respectively. Table 6.3B.1 shows a list of storm water pollution removal efficacy of the Kraken filtration MTD unit as tested under the TAPE protocol.

Table 6.3B.1: Pollutant removal efficiency of the Kraken MTD in accordance with TAPE protocol

Pollutant type	Average influent concentration mg/l	Average effluent concentration mg/l	Removal efficacy
Total Suspended Solids	73.1	7.0	89%
Total Phosphorus	0.151	0.034	72%
Suspended Solids Conc.	151.3	6.9	89%
Nitrogen (TKN)	1.5	1.0	31%
Fecal Coliform	692	355	60%
Motor Oil	4.6	0.7	81%
Total Zinc	0.158	0.054	54%
Total Copper	0.042	0.017	52%
Diesel Range Organics	1.2	0.4	65%

Table 6.3B.2 shows an excerpt of a list that DPP has published to endorse the MTD "Kraken" as "Alternative Compliance BMP".

Table 6.3B.2: Excerpt of DPP table endorsing the Kraken MTD unit

Description in DPP table	Performance
Manufacturer	Bio Clean Environmental Services, Inc.
Product	The Kraken
Treatment type	Basic
Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE)	
Treatment type	Basic
Additional Treatment Type	Phosphorus
Use level	Conditional Use Level
New Jersey Department of Environmental Protection (NJDEP)	
Certified TSS Removal Rate	80%
City and County of Honolulu	
Device Type	Alternative Compliance BMP

Kapa'a Stream - 303-listed Stream:

The Kapa'a Stream Is a "303-listed" inland water as defined under the Clean water Act (CWA) §303(d).

The background of the listing of Kapa'a Stream can be found in the Department of Health publication "The 2018 STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress, Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)". The reported values for the Kapa'a Stream (Oahu) are found in Appendix B – 15 in this document. Table 6.3B.3 shows the values for the Kapa'a Stream.

Table 6.3B.3: Excerpt of the 2018 State of Hawaii WQ Monitoring and Assessment

Description in the table	Reported values
Assessed Water Body	**Kapa'a Stream**
Water Body Type	Stream
Water Body ID	3-2-13-Kapaa
TN	V_T
NO3+NO2	V
TP	V_T
Turbidity	V
TSS	V_T
Other Pollutants	Metals, Lead
Category	3,4a,5
TMDL Priority	TMDLs approved, 2007, (TN, TP & TSS)

The entries in Table A.3 are defined as follows:

- V = visual listing from 2001 - 2004
- VT = visual listing from 2001 - 2004 (TMDL approved for parameter)
- 3 = not enough data to evaluate
- 4a = TMDL approved
- 5 = at least one use not attained, TMDL needed

In accordance with TMDL priorities in TN,TP and TSS, the type of MTD used has the following removal efficiencies."

TN = 31% removal

TP = 72% removal

TSS = 89% removal

Other pollutants could be identified as an average of approximately 50% removal.

6.4 Interrelationship of the Storm Water System and Proposed Finish Grade

This section describes the interrelationship of the storm water system and the finish grade in the Lower site. The proposed storm water system has four ~~three~~ drainage outlets from the project site to the Kapa'a Stream corridor. Figure 6.4.1 shows the four ~~three~~ drainage systems and outlets 1 through 4~~3~~, serving the drainage areas 1 through 4~~3~~. The conveyance of storm water through drainpipes from the farthest drain inlet close to the southern site perimeter to the storm water treatment and detention facilities at the Northern site perimeter requires significant hydraulic head to overcome flow and elevation losses. Therefore, the finish grade elevation must be adequately high to provide the required hydraulic gradient.

Appendix D describes the relationship between the updated storm water system of the Lower site and the proposed finish grade. Instead of three drainage areas, the updated storm water drainage in the Lower site has now four drainage areas. Appendix D describes the required elevation of the full build-out finish grade to discharge the runoff from the drain inlets to the treatment facilities as the Northern site perimeter.

In the comments about the DSEIS, the issue was raised that the rooftops of the buildings in the Lower site had too much height from the existing grade. As stated, in accordance with ROH 21 the allowable height of buildings must be measured from existing not the finish grade. Appendix D presents the response that an exception in ROH is given. If the site requires the finish grade to be raised to build essential infrastructure, such as site drainage, the height of the buildings should be measured from the finish grade.

6.4.1 Elevations Along the Storm Water Drainage Facilities

This section discusses the elevations along the various storm water treatment and management system components. To safeguard good drainage of the site and discharge of the runoff to the adjacent stream corridor there must be a sufficient hydraulic gradient between the furthest point of the storm water drainpipes and the treatment and management system, as well as the outlets.

It is evident that the elevation of the drain outlets of the four ~~three~~ drainage areas must be at the same height or above the elevation of the adjacent stream corridor at the points of discharge. Figure 6.4.1.1 shows the horizontal location of the station line along the Northern site perimeter, which borders at the Kapa'a Stream corridor. The station numbers of the four ~~three~~ discharge points for the four ~~three~~ drainage areas - the distances from the start of the station line - are indicated in the Figure 6.4.1.1.

Figure 6.4.1.1 shows a cross-section along the station line defined in Figure 6.4.1.1. The cross-section depicts the elevations of the site at the inside boundary of the site perimeter buffer zone and the elevations at the foot of the site perimeter berms.

As the storm water runoff flows through the drainage systems of the four ~~three~~ drainage areas of the Lower site, various elevation losses are incurred. These losses are due to hydraulic losses which are associated with the flow through pipes, distribution in swales, inlets into the various process components, flowing over the grassy vegetated buffer strip surface, exit from various process components, and flowing through filter media. For the four drainage areas 1 through 4 four ~~three~~ cross section illustrations are presented in Figures 6.4.1.3, 6.4.1.4, 6.4.1.5 and 6.4.1.4.B. These figures show the type and the magnitude of the elevation losses along the storm water drainage process.

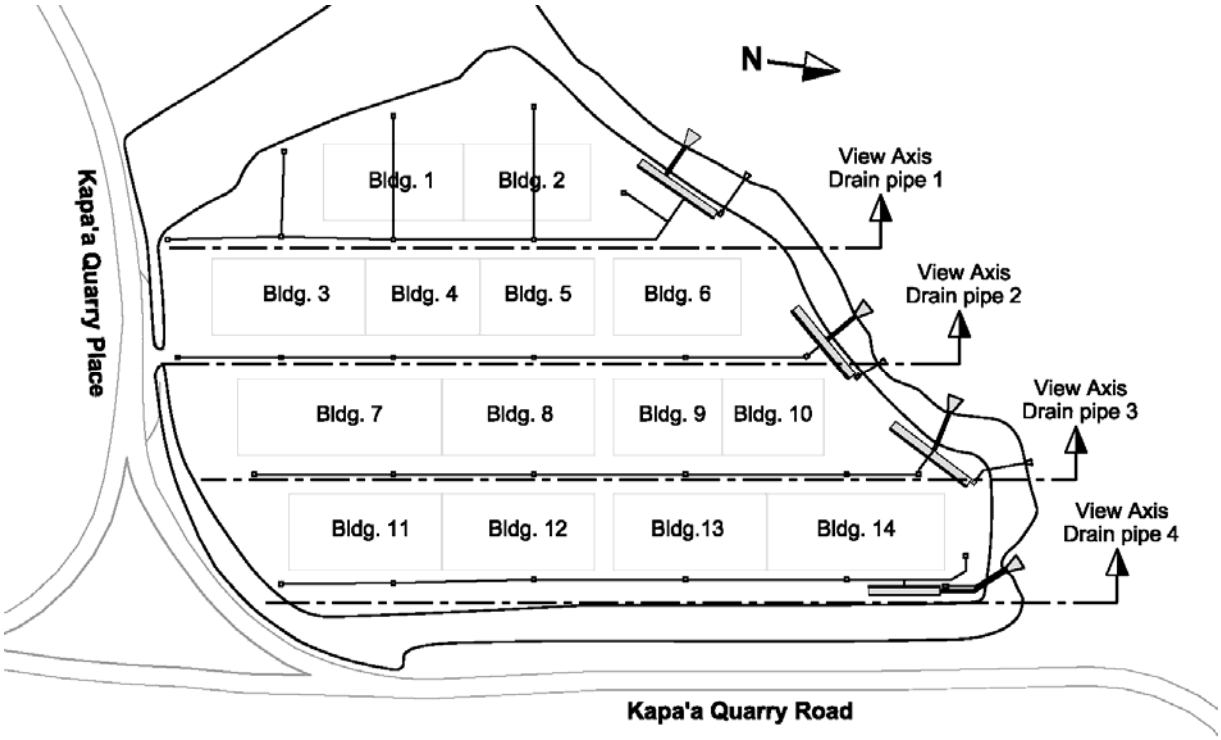


Figure 6.4.1.1: Station line along the Northern site perimeter, (this Figure has been changed from the DSEIS), refer to Appendix D

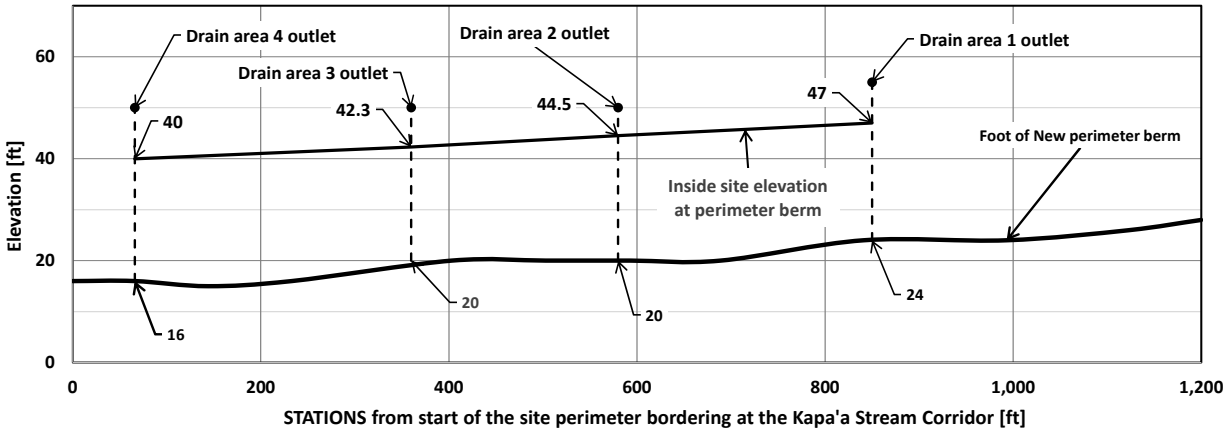


Figure 6.4.1.2: Cross-section along the station line shown in Figure A; (this Figure has been changed from the DSEIS), refer to Appendix D

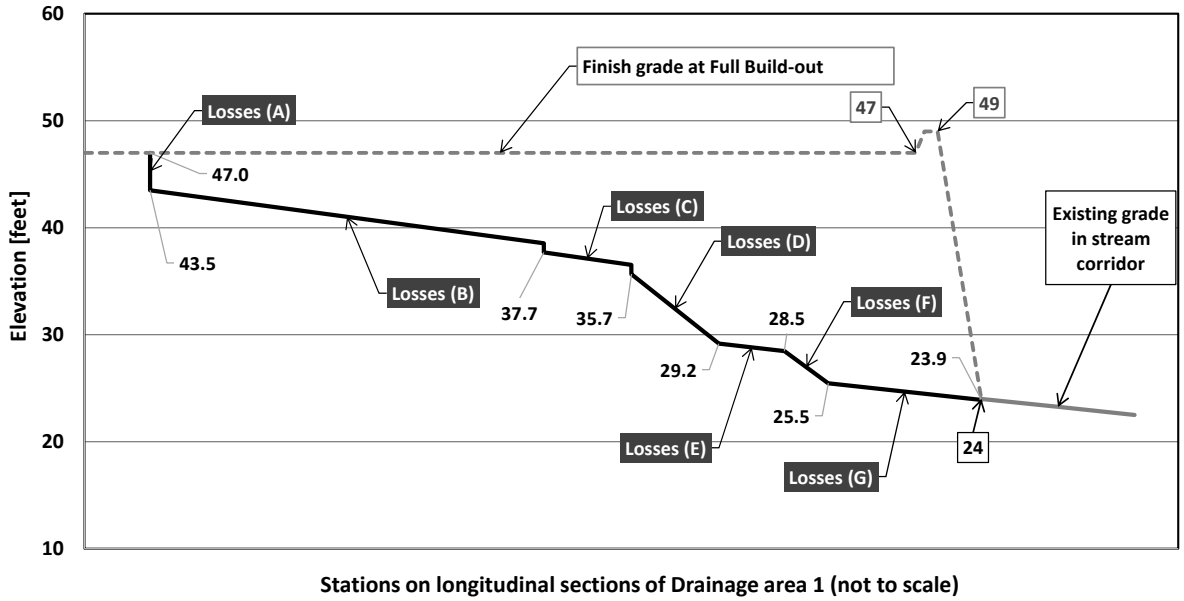


Figure 6.4.1.3: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 1 – Lower site** (this Figure has been changed from the DSEIS; Refer to Appendix D)

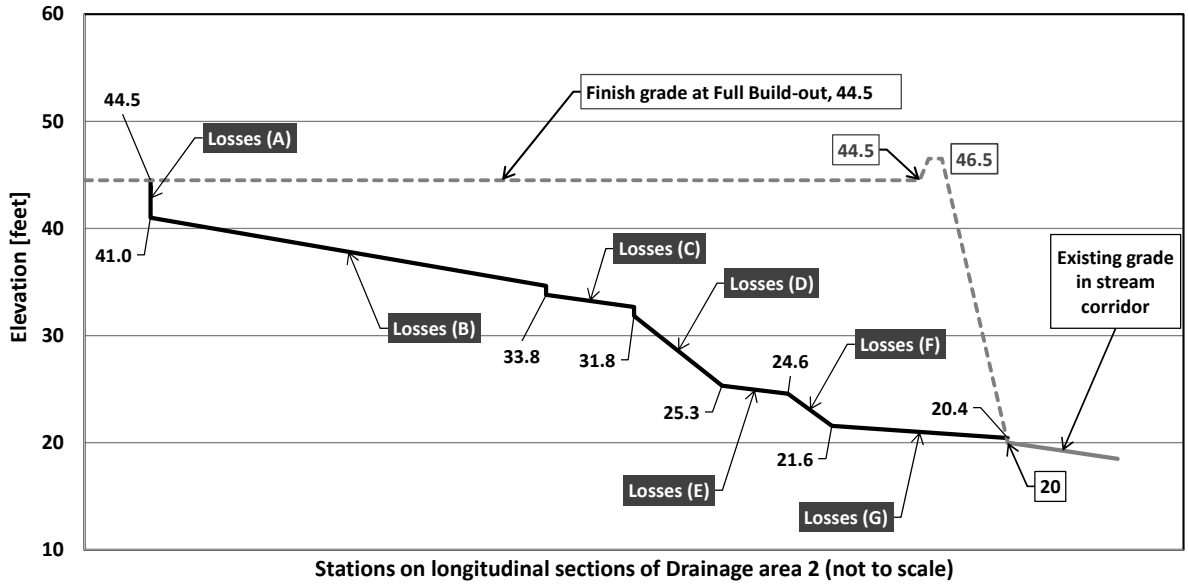


Figure 6.4.1.4: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 2 – Lower site;** (this Figure has been changed from the DSEIS; Refer to Appendix D)

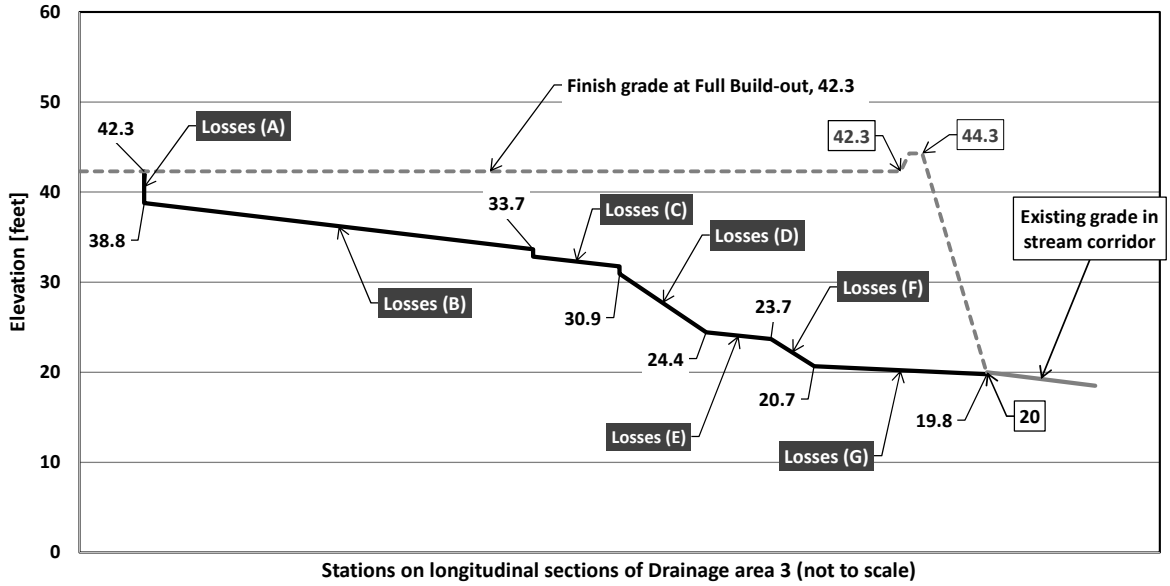


Figure 6.4.1.5: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 3 – Lower site;** (this Figure has been changed from the DSEIS; Refer to Appendix D)

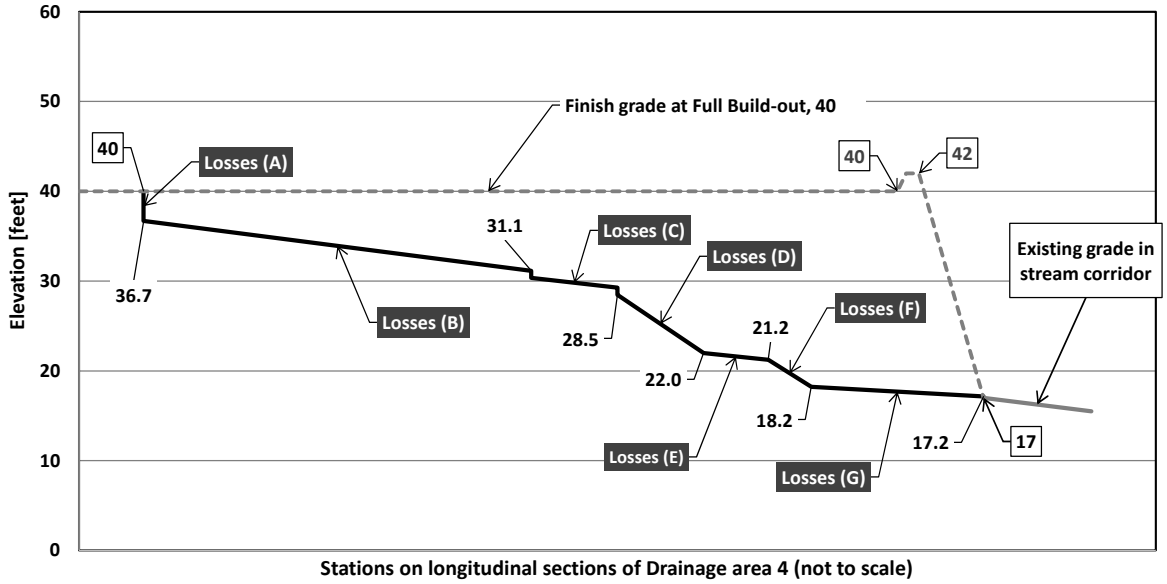


Figure 6.4.1.5.B: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 4 – Lower site;** (this Figure has been added to the FSEIS from the DSEIS; Refer to Appendix D)

The elevation losses for the three drainage areas are listed in Table 6.4.1.1

Table 6.4.1.1: Description of the elevation losses in the drainage process for the three drainage areas 1 through 3 in the Lower site; (this Table has been changed from the DSEIS; Refer to Appendix D)

Losses ID	Description of losses in the drainage process	Drainage areas in Lower site							
		Drainage area 1		Drainage area 2		Drainage area 3		Drainage area 4	
		data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]
Losses (A)	**Elevation loss in drain inlet**		3.5		3.5		3.5		3.3
	Invert below finish grade	3.5		3.5		3.5		3.5	
Losses (B)	**Elevation losses in drain pipe**		5.0		6.4		5.2		5.6
	Drain pipe length:	900		1060		1,030		1,010	
	Drain pipe slope:	0.55%		0.60%		0.50%		0.55%	
Losses (C)	**Elevation losses in vegetated buffer strip**		2.9		2.8		2.7		2.7
	Losses include distribution loss, entry loss, loss of flow through the buffer, exit loss to collection								
Losses (D)	**Elevation losses in detention vault**		6.5		6.5		6.5		6.5
	Losses include inlet losses, elevation of detention vault to empty completely, exit losses								
Losses (E)	**Elevation losses pipe to MTD**		0.7		0.8		0.8		0.8
	Losses from connection pipe to MTD								
Losses (F)	**Elevation losses in MTD**		3.0		3.0		3.0		3.0
	Losses in MTD include entry losses, losses from hydraulic head above filters, exit losses								
Losses (G)	**Elevation losses from MTD to outfall point**		1.6		1.1		0.9		1.1
	Losses include entry losses, flow losses, losses due to energy dissipation (riprap)								
	Sums of elevation losses along drainage process flow		**23.1**		**24.1**		**22.5**		**22.9**
	Finish grade at the start of the drainage process flow		**47**		**44.5**		**42.3**		**40**
	resulting elevation at WQ discharge invert at site perimeter		**23.9**		**20.4**		**19.8**		**17.2**
	Approximate elevation of existing grade in Kapa'a Stream corridor		**24**		**20**		**20**		**17**

6.4.2 Why the Accepted Grade is Insufficient to Install the Preferred Storm Water System

The full build-out finish grade in the Lower site was accepted in the SMP Minor Modification 2017/MOD-37 (MT) to the Special Management Area Use Permit No. 2014/SM-27. The accepted grade is depicted in Figure 6.4.2.1. The accepted grade under the 201 4SMP minor modification would create a flat project site with a 0.75% slope towards the North-East corner of the site.

Figures 6.4.2.2 through 6.4.2.4.B show elevation losses for the proposed drainage system with the previously accepted grade (in SMP 2017/MOD-37) superimposed. Figure 6.4.2.2 includes the accepted full build-out finish grade ("accepted grade") in the cross-sectional depiction of the Drainage areas 1. The proposed grade has elevation contours which are parallel to the Kapa'a Quarry Road and therefore the proposed grade appears as a horizontal line in the figure. The accepted grade has a slope in the figure due to the fact of the North-East slope of the finish grade. Figures 6.4.2.2 through 6.4.2.4.B indicate that the accepted grade would not provide sufficient elevation to convey storm water runoff from the first inlet to the discharge point to the stream corridor. Figures 6.4.2.2 through 6.4.2.4.B

illustrate that the accepted grade would not provide the sufficient elevation to install the preferred storm water treatment and detention system in all four drainage areas.

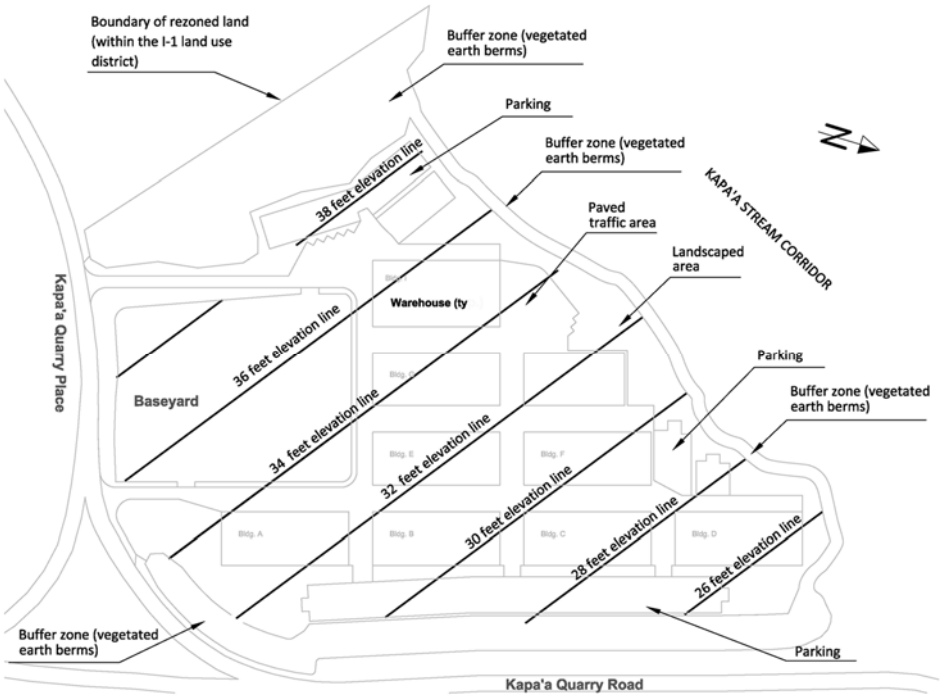
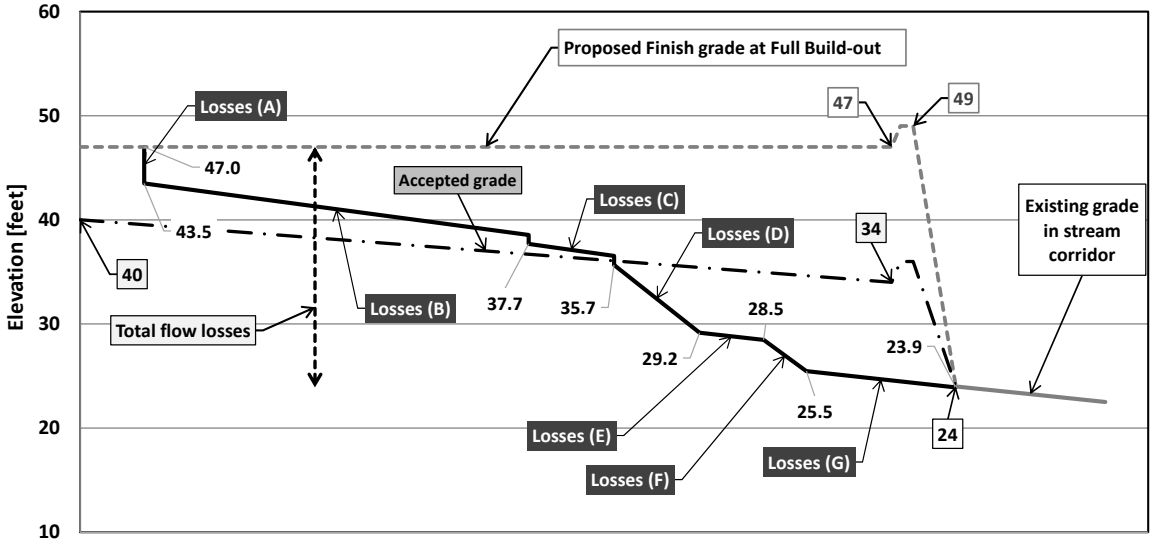


Figure 6.4.2.1: Finish grade at full build-out of project site

(source 2017/MOD-37 written statement, Figure 3.2.1)

This is the **Accepted Grade**



Stations on longitudinal sections of Drainage area 1 (not to scale)

Figure 6.4.2.2: Proposed storm water treatment process with proposed and accepted grade for **drainage areas 1** (Total elevation losses from first inlet to discharge to Stream corridor = 24 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

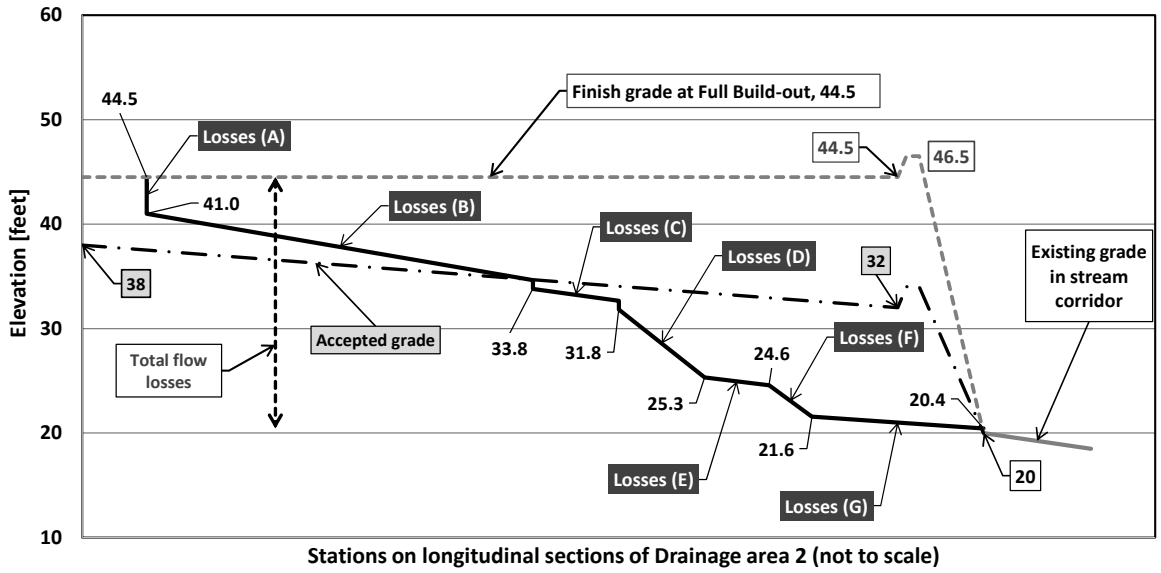


Figure 6.4.2.3: Proposed storm water treatment process with proposed and accepted grade for **drainage area 2** (Total elevation losses from first inlet to discharge to Stream corridor = 24.1 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

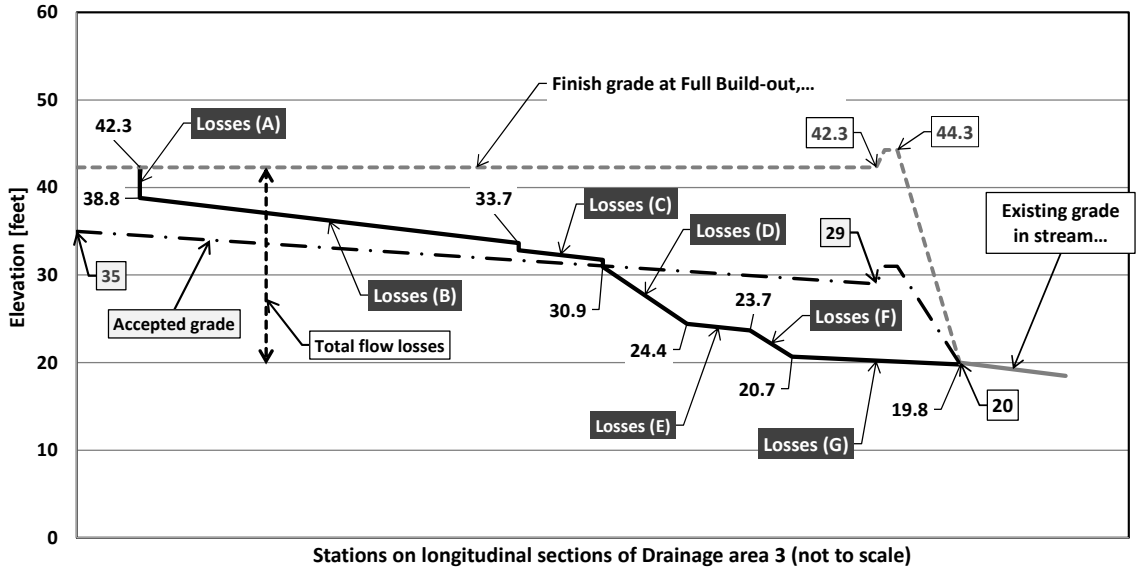


Figure 6.4.2.4: Proposed storm water treatment process with propose and Accepted grade for **drainage area 3** **(**Total elevation losses from first inlet to discharge to Stream corridor = 22.5 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

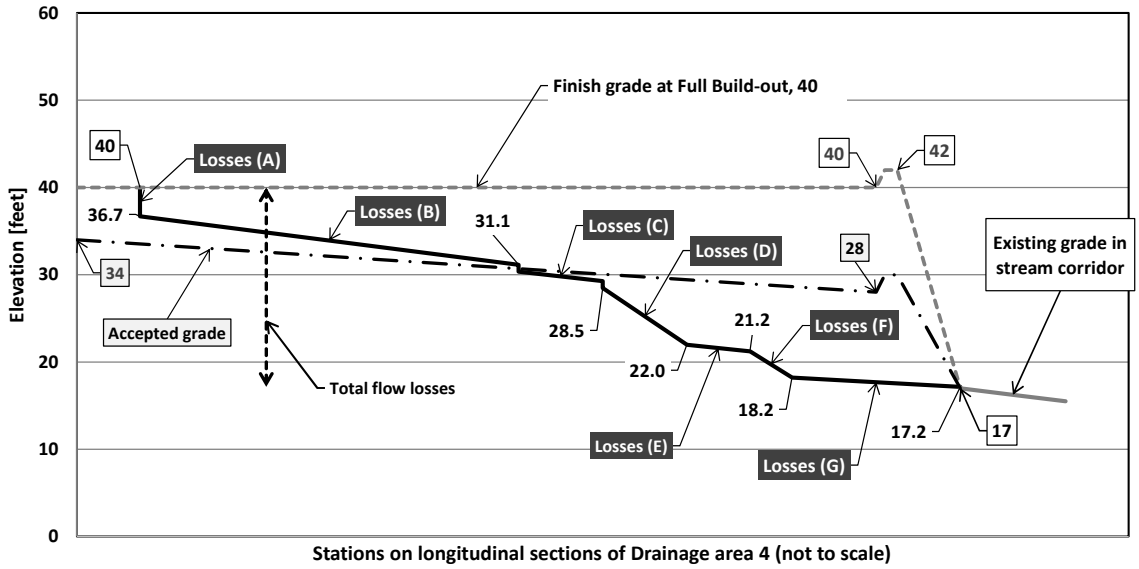


Figure 6.4.2.4.B: Proposed storm water treatment process with propose and Accepted grade for **drainage area 3** **(**Total elevation losses from first inlet to discharge to Stream corridor = 22.9 feet); (this Figure has been added; Refer to Appendix D)

6.5 Site Perimeter Berms Typical Cross Sections

This section describes the new site perimeter berms which have higher elevations than the berms approved under the SMP Minor Modification 2017/MOD-37. The higher elevation of the berms is required to provide lateral stability for the finished grade of the upgraded site development plan, which also has higher elevation than the finish grade approved in 2017 the SMP Minor Modification.

6.5.1 Locations of Representative Cross Section

Using 9 representative cross sections, the new site perimeter berms under the updated site development plan will be compared to the perimeter berms which were approved under the SMP Minor modification 2017/MOD-37. Figure 6.5.1.1 shows the locations of the 9 representative cross sections S-1 through S-9.

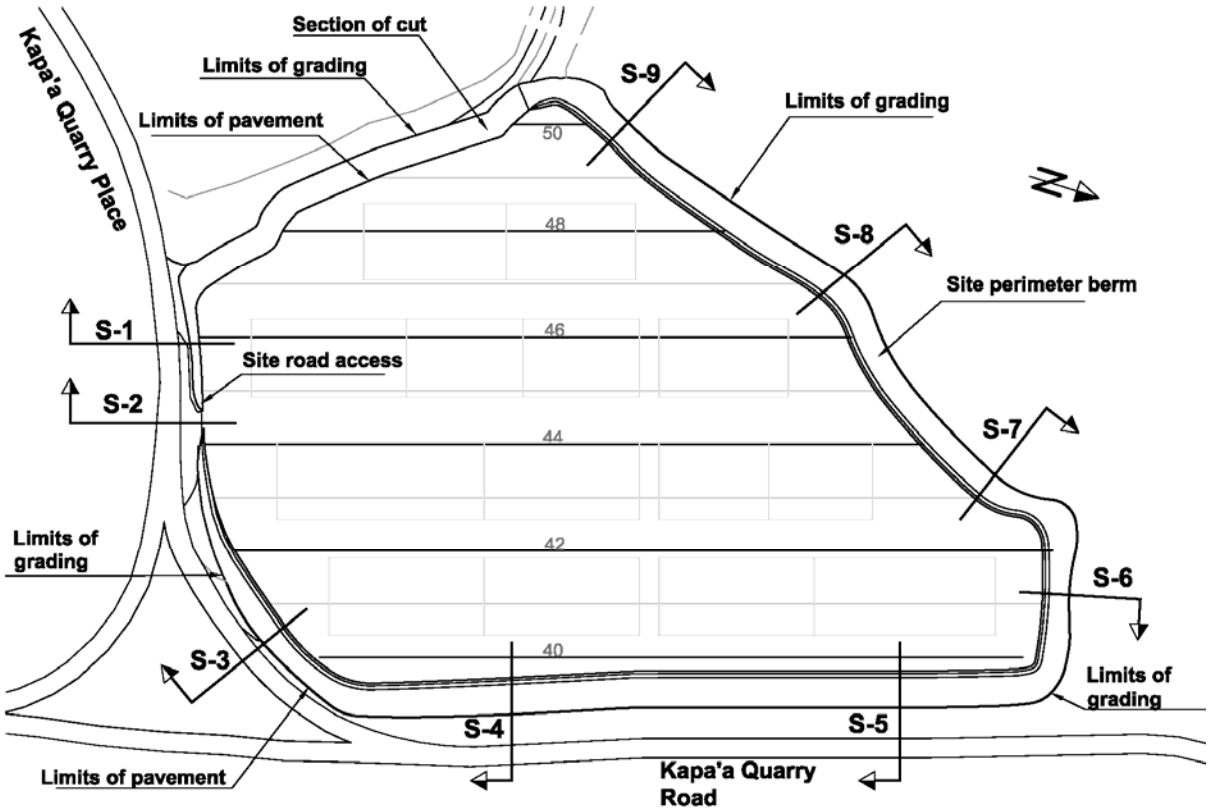


Figure 6.5.1.1: Locations of the 9 representative cross sections of the perimeter berms (S-1 through S-9)

6.5.2 Representative Cross Section

Figure 6.5.2.1 through 6.5.2.9 shows the representative cross sections S1 through S9.

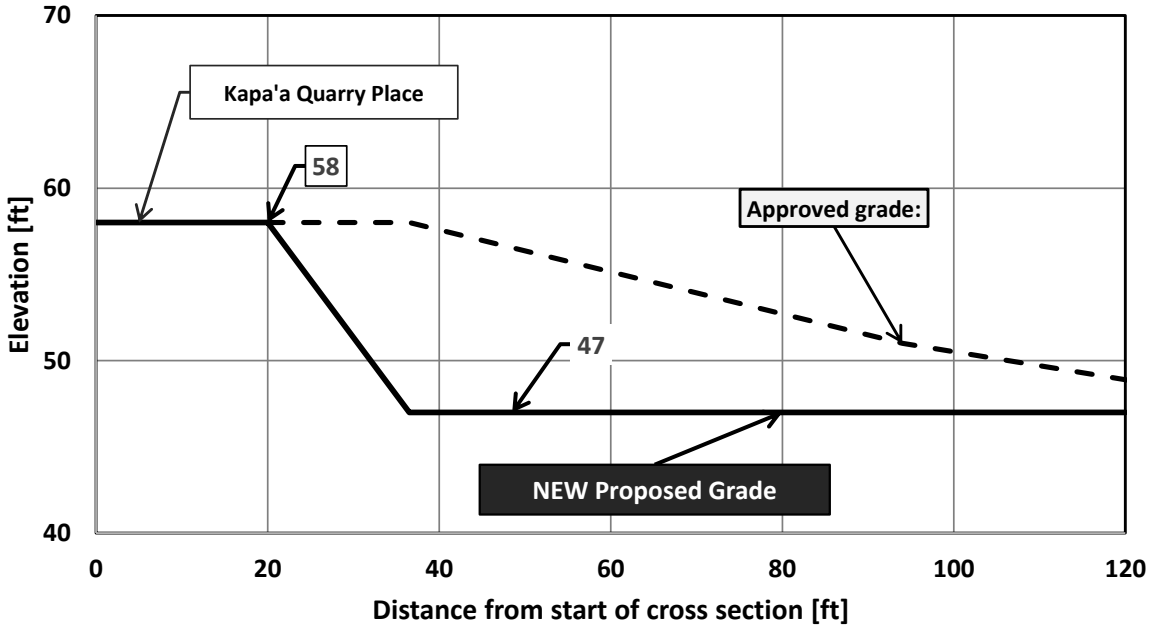


Figure 6.5.2.1: Cross section S-1

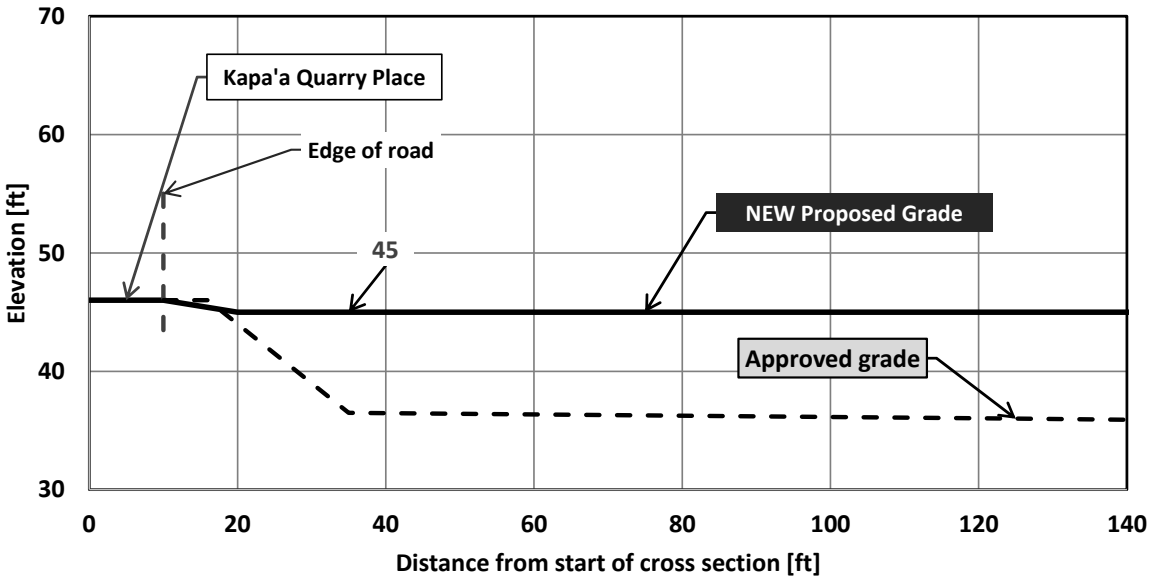


Figure 6.5.2.2: Cross section S-2

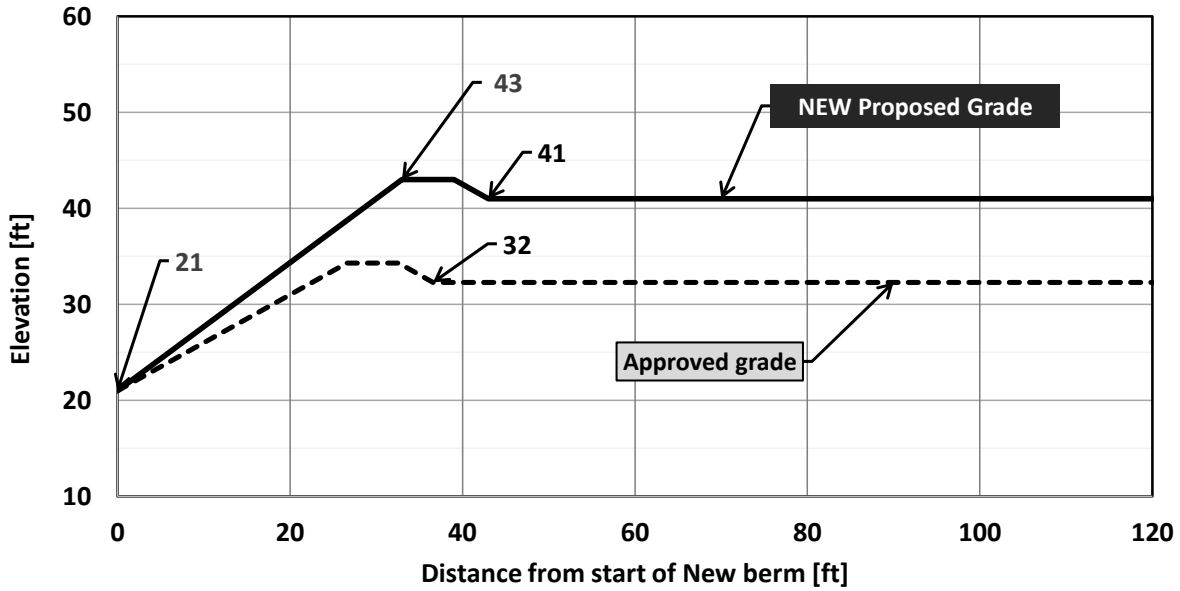


Figure 6.5.2.3: Cross section S-3

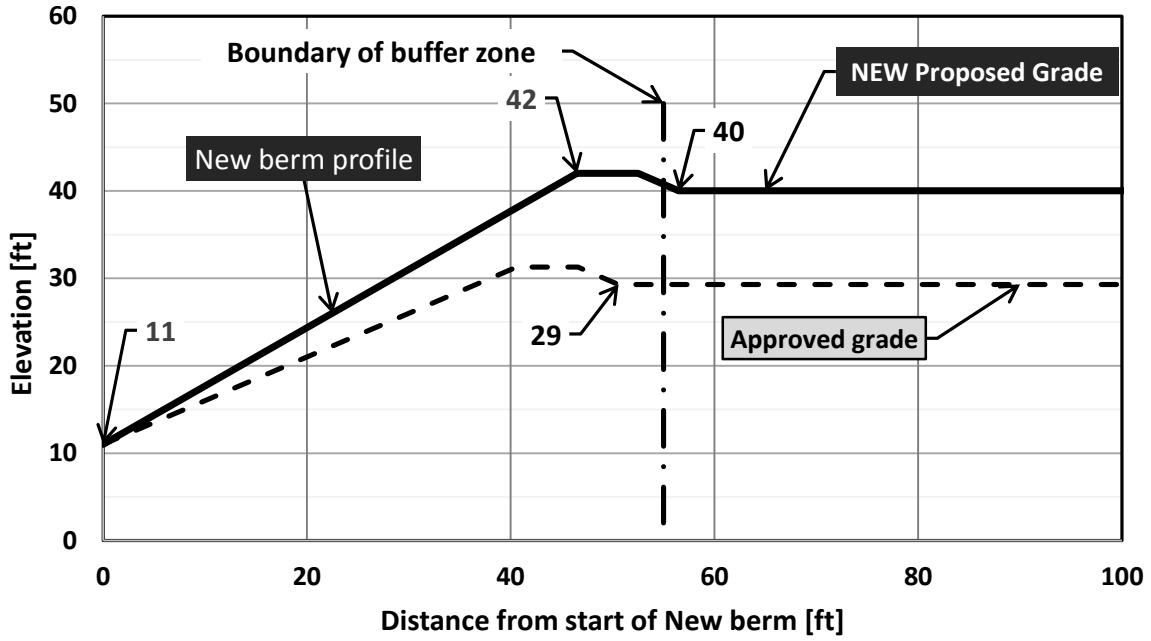


Figure 6.5.2.4: Cross section S-4

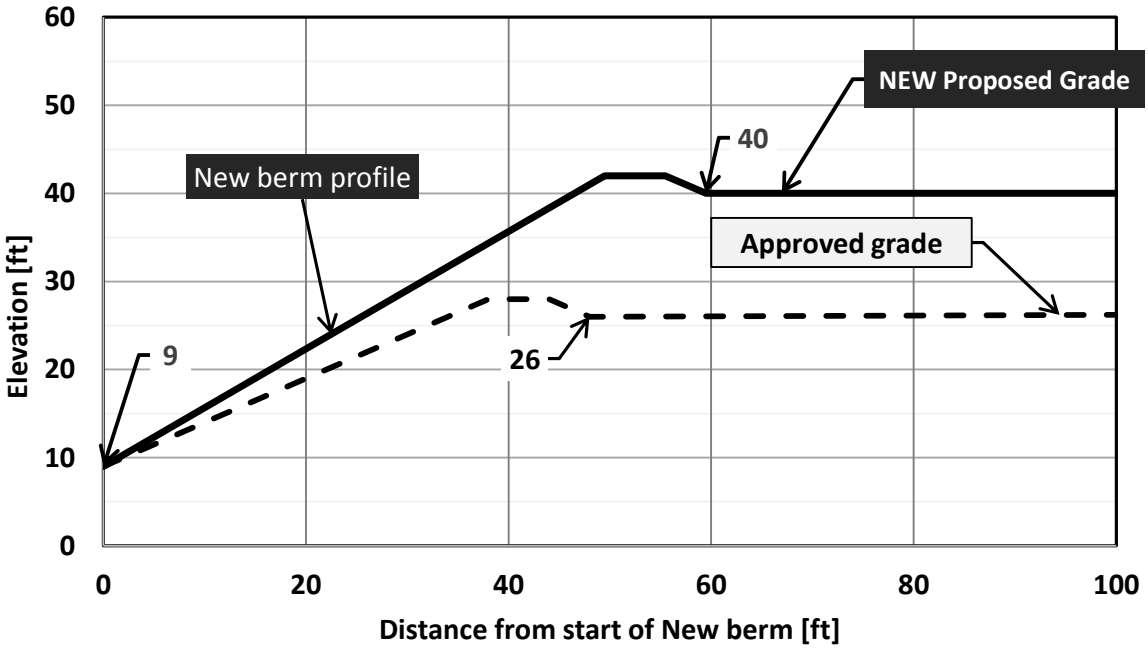


Figure 6.5.2.5: Cross section S-5

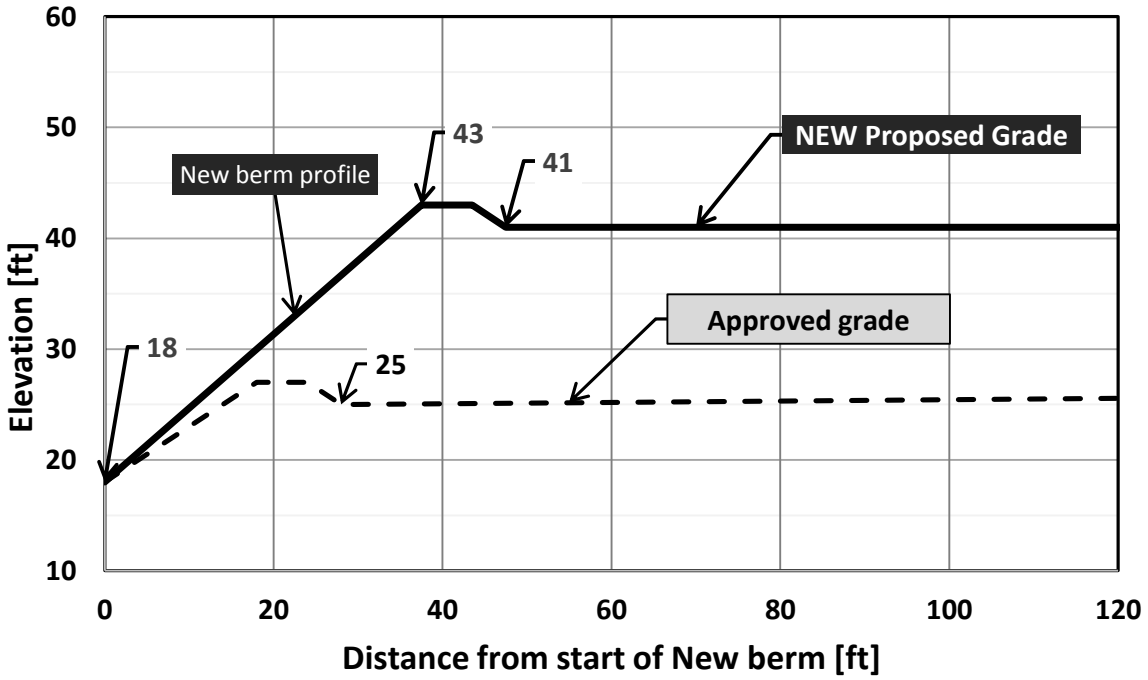


Figure 6.5.2.6: Cross section S-6

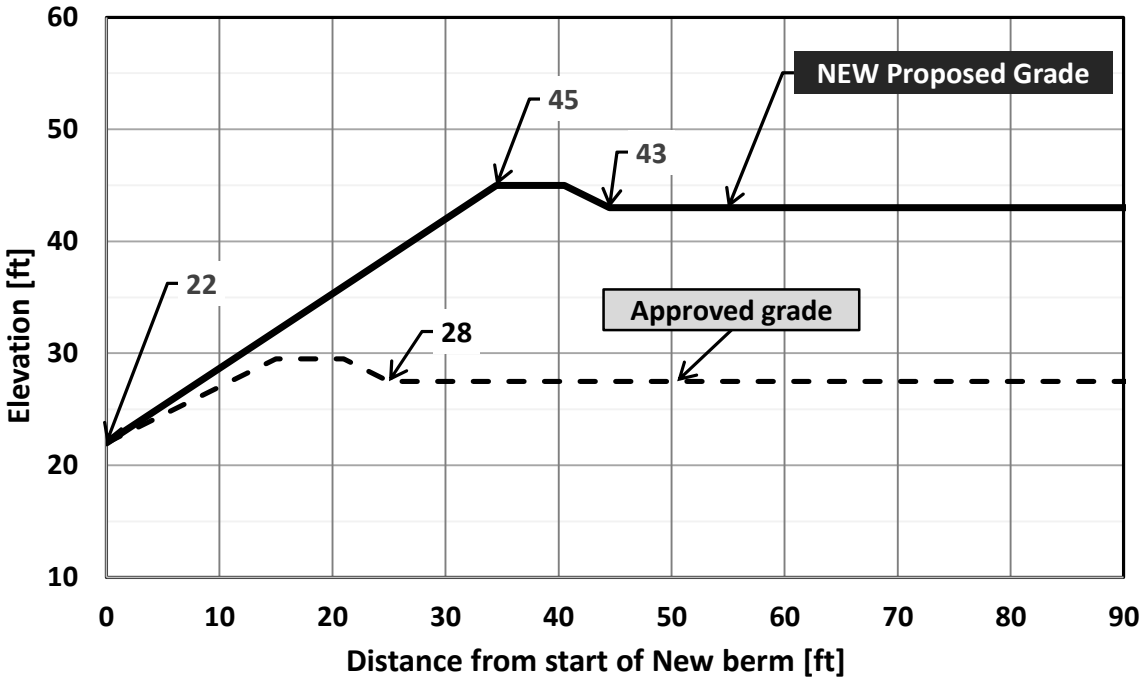


Figure 6.5.2.7: Cross section S-7

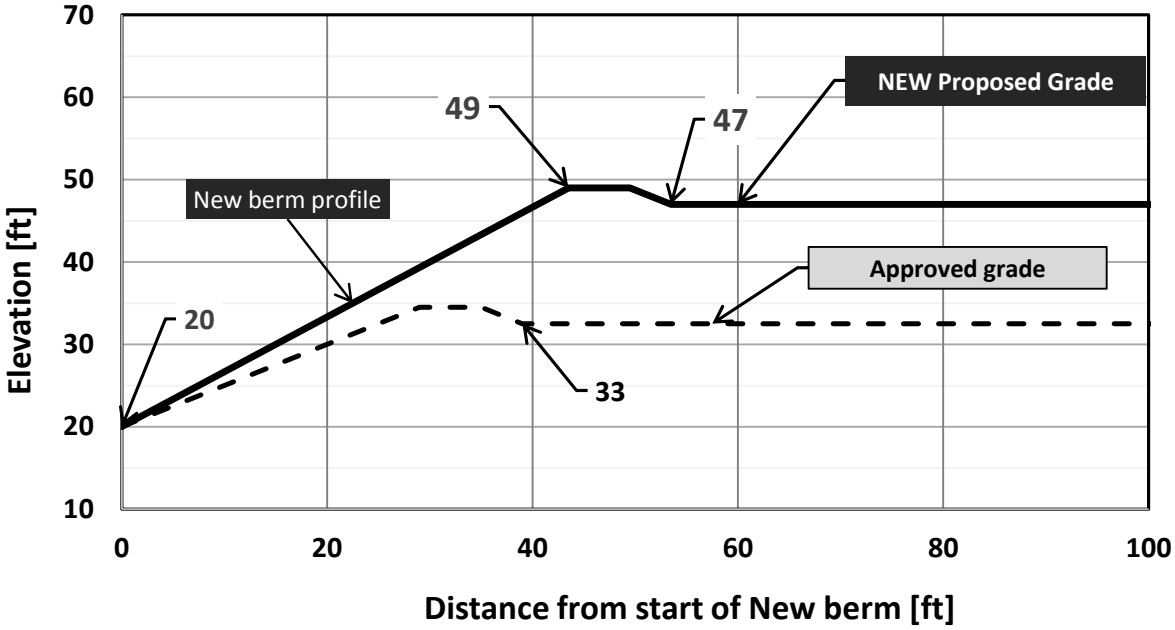


Figure 6.5.2.8: Cross section S-8

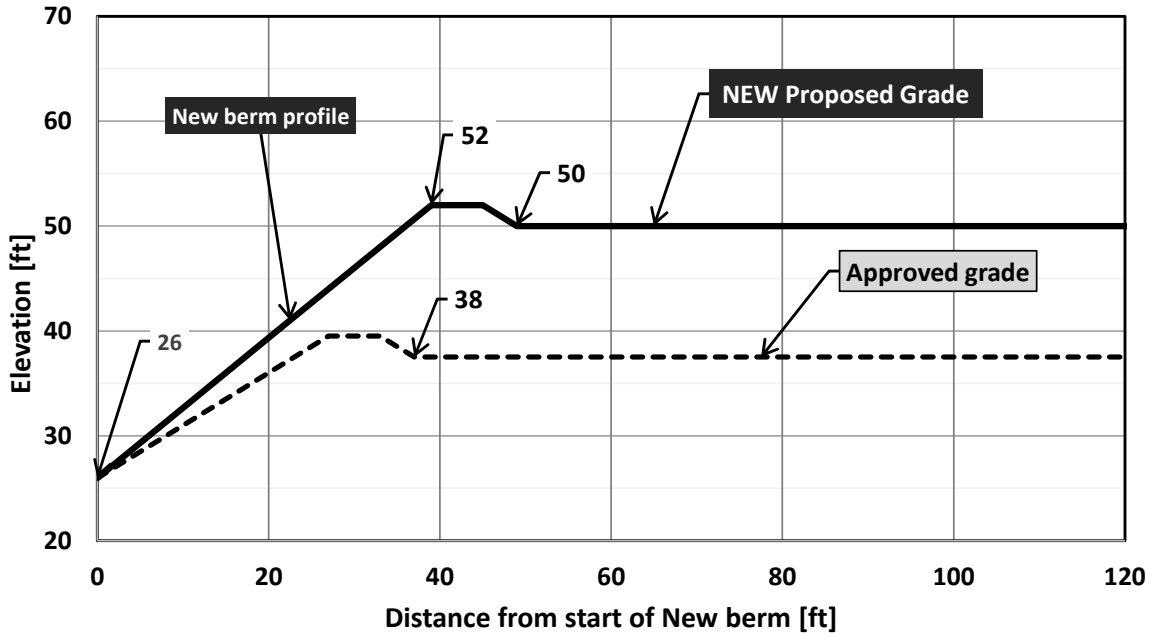


Figure 6.5.2.9: Cross section S-9

6.6 Assessing the Visual Impact of the Increased Site Perimeter Berms

Visual impact from the site perimeter berm has been mentioned in the scoping as a pertinent impact to consider. A comprehensive visual impact study was conducted for the Lower portion of the site under the updated site development plan. This visual impact study is presented hereafter.

The potential visual impact of the proposed development was mentioned in several comments, and is therefore described in more detail. Appendix G of the FSEIS elaborates on visual impacts the proposed development could cause. Appendix G describes different visual impact mitigation measures which are mentioned in the literature. These visual impact mitigation measures use vegetative screens around the development and facilities, but also use color schemes to support facilities and buildings to blend into the background. Applicable visual impact mitigation strategies and technologies would be used for the Lower site.

6.6.1 Background and Previous Visual Impact Examination under the 2011 FEIS

A visual impact study was performed for the 2011 FEIS. The study described the visual impact by the proposed project for two types of view planes:

- Distant view planes: These views are experienced by observers from a larger distance. These larger distance visual experiences accentuate how the proposed facility blends into or stands out from the backdrop of the Koolau mountain range. These views are typically from points across the Kawainui Marsh towards the Kapa'a Valley.
- Adjacent view planes : These views are experienced by observers who pass close by the site, typically driving on the Kapa'a Quarry Road or the Kapa'a Quarry Place or spend time in a recreational area directly to the East of the Lower portion of the site.

In this visual impact study describes visual experience from both distant and adjacent view planes. This visual impact study uses photographic images to illustrate distant and adjacent view planes as well as line drawing representing cross-sections through the site perimeter berms.

One of the major considerations of this study is the future visual impact triggered by the proposed increase in elevation of the full build-out finish grade project site, and especially the increase in height of the New site perimeter berms.

The 2011 FEIS concluded that the previously proposed site development plan described under the 2011 FEIS did not have significant visual impact from distant view planes. The 2011 FEIS further concluded that visual impacts from adjacent view planes did not have adverse impact due to the visual impact mitigation of vegetation planted around the project site perimeter.

6.6.2 Visual Impact Assessment of Distant View planes using Photographic Images

This section assesses visual impressions of observers prompted by views on the Proposed Action by using photographic images. This section presents eight representative distant view planes, which have significance since they may affect observers from Kailua and the H3- John Burns Freeway which passes the project site along the Northern site perimeter.

Table 6.6.2.1 describes depictions of view planes that are shown in in Figures 6.6.2.1 through 6.6.2.8. Table 6.6.2.1 provides short descriptions of the expected visual experiences of observers.

Conclusions: The distant views illustrated in Figures 6.6.2.1 through 6.6.2.8 suggest that the present project site is visible from some distant view planes. Views across the Kawainui Marsh towards the project site show that there are no adverse visual impacts of the project site. In general, warehouse structures on the Upper portion of the site can be seen, but blend into the towering Koolau mountain range. The existing warehouses also appear small compared to existing structure structures of the Kapa'a Transfer Station, thus eliciting less attention than the existing transfer station.

Perhaps the most obvious views an observer can experience the project site, the Kapa'a Light Industrial Park, is when travelling South-West bound on the H3-Freeway. Parts of the project site appear visible behind a screen of scrubs and trees which were planted on the Southern perimeter of the H3-Freeway. This vegetated screen on the Southern side is, however, very dense, and totally obstructs views of the project site.

The proposed development in the Lower site will not significantly or negatively affect the distant views beyond the visual impacts caused by the existing project site.

Table 6.6.2.1: Description and discussion of Figures 1 through 8 showing visual impacts pf the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
1	View 1 - From the flood control levee at the East side of Kawainui Marsh towards the project site: The view plane reflects the visual impression of looking Eastwards across the Kawainui Marsh towards the project site. The figure indicates the location of the project site. Several white buildings indicate warehouses in the Upper site.	It is expected that portions of new development in the Lower portion will be somewhat noticeable but the visual impact from new warehouses in the Lower site will not significantly change the current visual impact. It is expected that further addition of trees at the Eastern perimeter of the Upper site will effectively shield warehouses from distant views.
2	View 2 - From the flood control levee at the East side of Kawainui Marsh towards the project site: The view plane reflects the visual impression of looking Eastwards across the Kawainui Marsh towards the project site. The figure indicates the location of the project site and the structures of the Kapa'a Solid waste Refuse Station.	The view 2 shows that the project site has a minor visual impact, and less than the structures of the Kapa'a Transfer station, which dominate structures in the backdrop of the Koolau mountain range.
3	View 3 - From the South-West bound H3-Freeway towards the project site: The view plane reflects the visual impressions of an observer traveling South-West bound on the H3-Freeway. The Upper site is visible as a group of warehouses structures. Behind the project site is the exposed rocks of the towering quarry, and further back the Koolau mountain range.	The view 3 shows that the project site is visible for a South-East observer passing the highest point of the H3-Freeway traveling has a minor visual impact. While the project site is noticeable, the visual impact is considered small, since the project site is not the dominate features.
4	View 4 -From the Mokapu Avenue towards the project site: The view plane reflects the visual impression of an observer travelling West bound on the Mokapu Avenue, while approaching the H3-onramp.	The view 4 shows that the project site is hidden behind vegetation planted on the Southern side of the Mokapu Avenue.

Table 6.6.2.1: Description and discussion of Figures 1 through 8 showing visual impacts pf the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
5	View 5 - From the South-East bound H3-Freeway at the Mokapu Avenue offramp towards the project site: The project site is almost not visible from the view plane. The location from where the photo was taken has a less dense vegetation along the edge of the roadway than other location nearby.	The view 5 illustrates that the project site is virtually hidden from the view of the observer. The location where the photo was taken has a denser vegetation at the Southern roadside than the rest of the offramp. Typically, the observer would not have a longer chance of looking in the direction of the project site, since cars are moving in the direction to the left.
6	View 6 – From the North-East bound H3-freeway towards the project site: The project site is to the right behind a dense vegetation screen.	The view 6 illustrates the visual experience of an observer traveling North-East bound on the H3-Freeway. The project site is hidden to the right behind a dense screen of tall trees.
7	View 7 – From the North-East bound H3-freeway towards the project site: The project site is to the right behind a dense vegetation screen.	The view 7 illustrates the visual experience of an observer traveling North-East bound on the H3-Freeway. The project site is hidden to the right behind a dense screen of tall trees. Both Figures 6 and 7 imply that the project site is not visible by observers passing the site on the H3-Freeway.
8	View 8 – View from South bound Kailua Road towards the project site: The project site can be seen across the Kawainui Marsh with the project site being about 1.5 miles away.	The view 8 shows the visual experience of an observer from the Kailua Road, which is about 1.5 miles from the project site. The project site is slightly visible and to the right of the structures belonging to Kapa'a Transfer station. The changes in the site development approach, especially the elevated grade and site perimeter berms would not impose a significantly different visual distant impact.

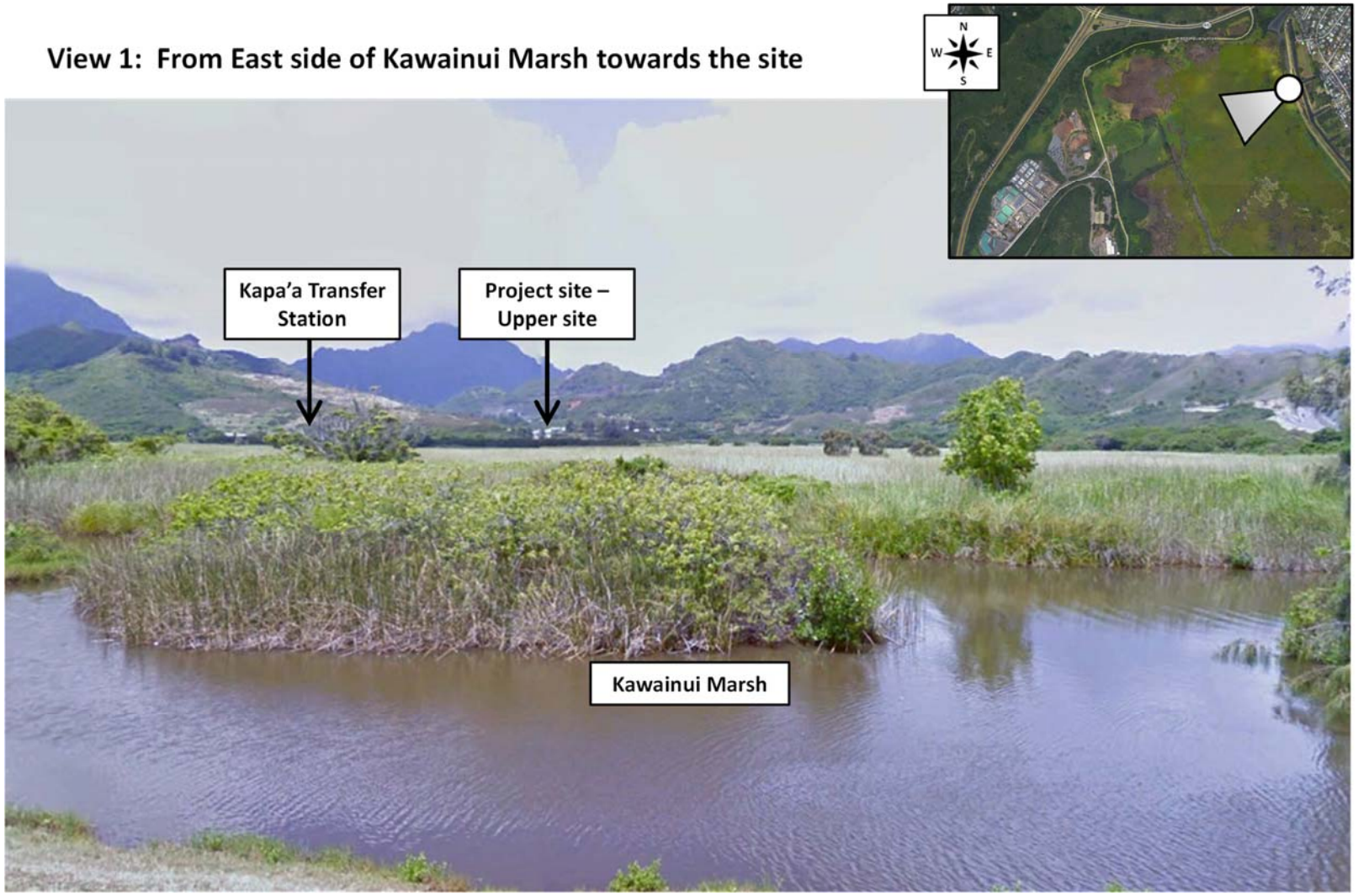


Figure 6.6.2.1: View 1 - From the flood control levee at the East side of Kawainui Marsh towards the site

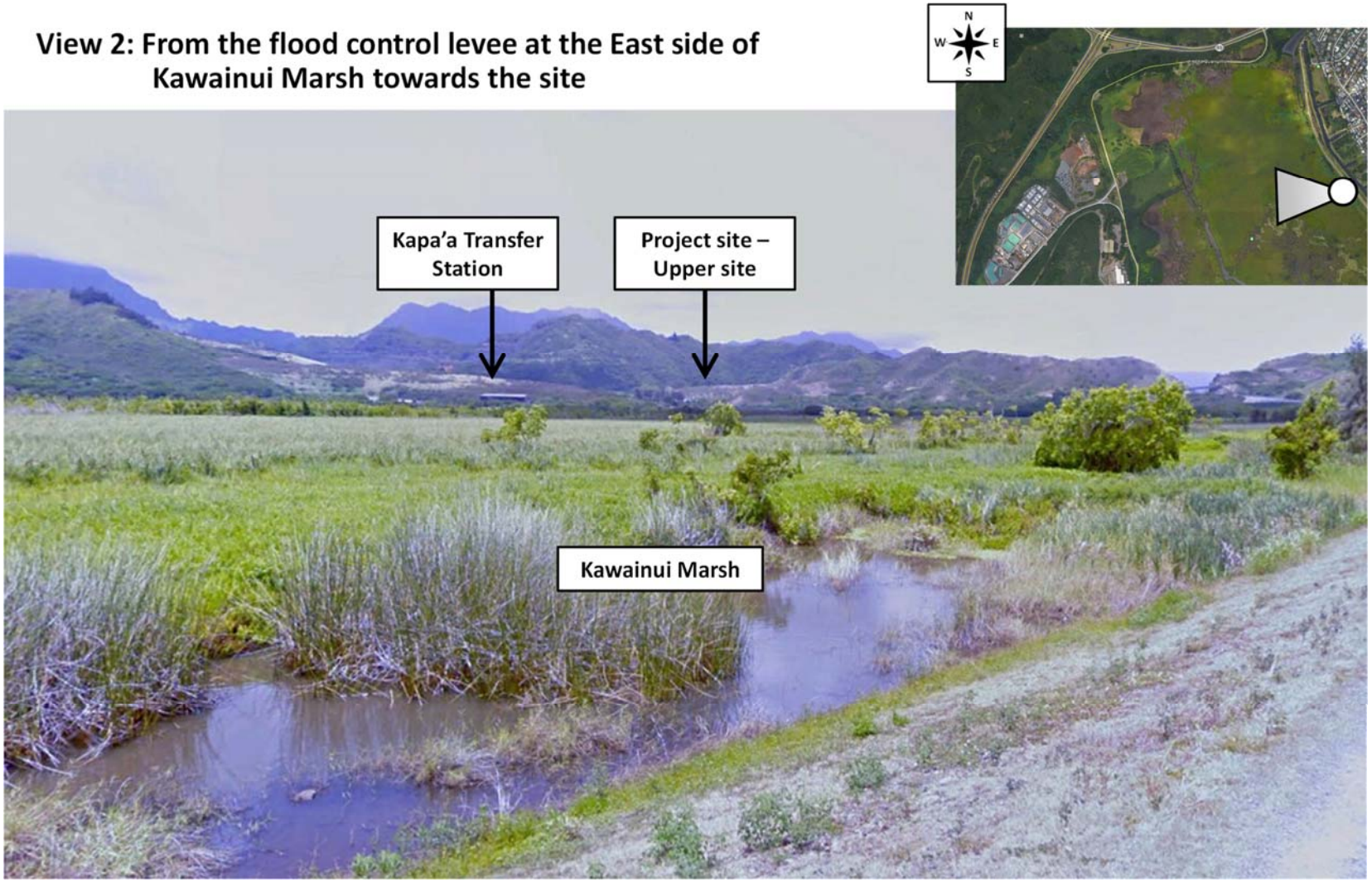


Figure 6.6.2.2: View 2 - From the flood control levee at the East side of Kawainui Marsh towards the site

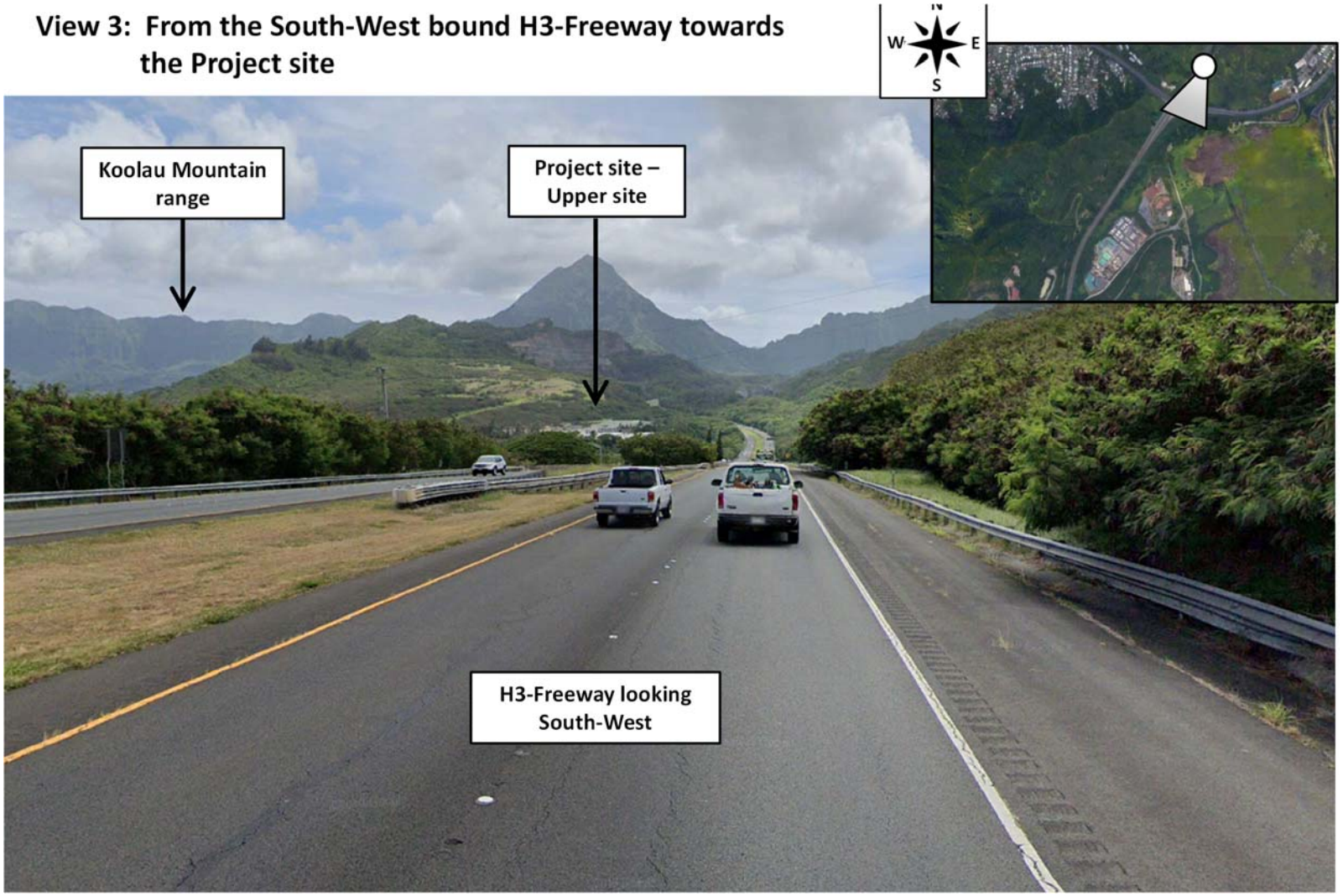


Figure 6.6.2.3: View 1 From East side of Kawainui Marsh towards the site

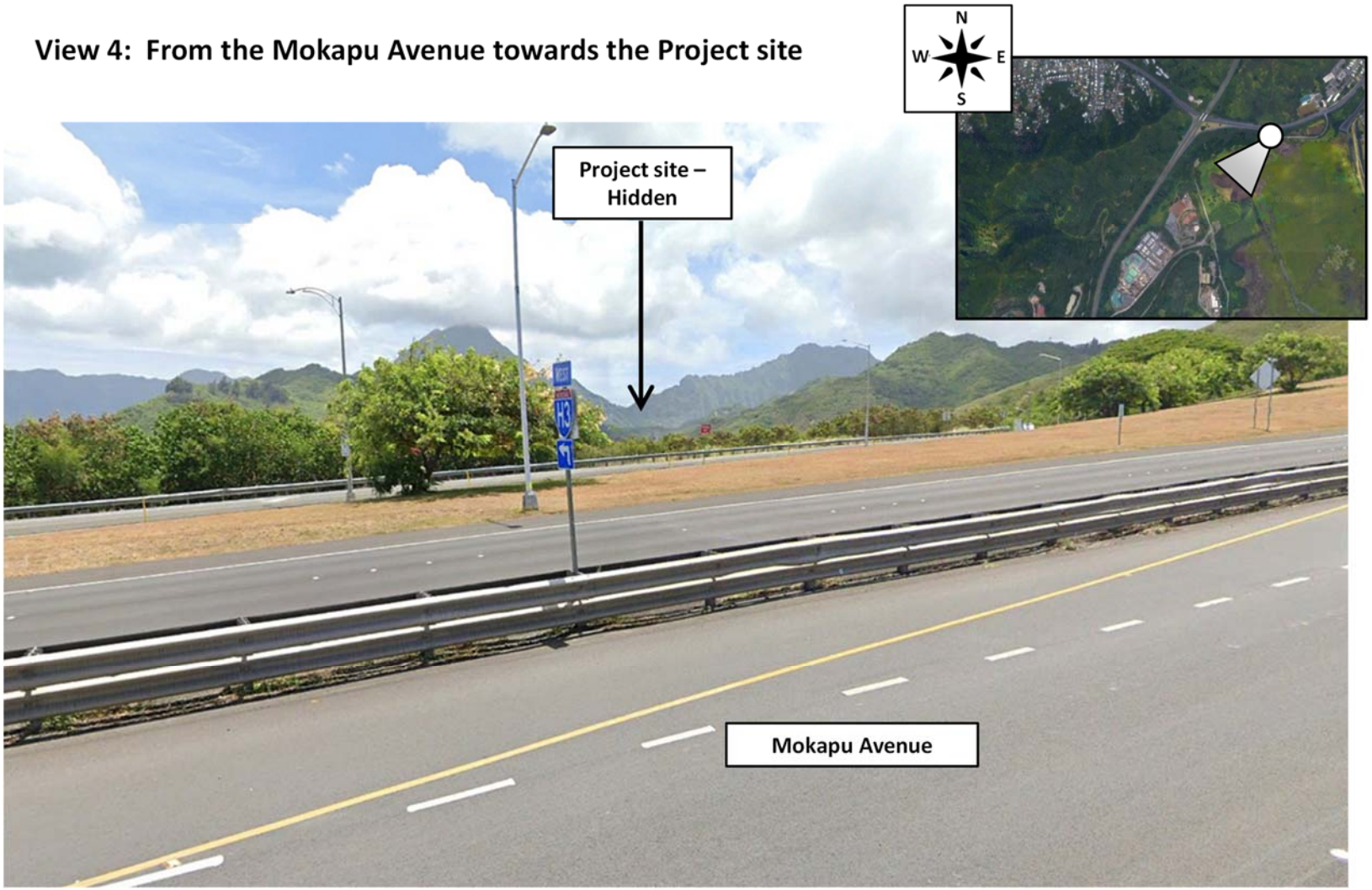


Figure 6.6.2.4: View 4: From the Mokapu Avenue towards the Project site

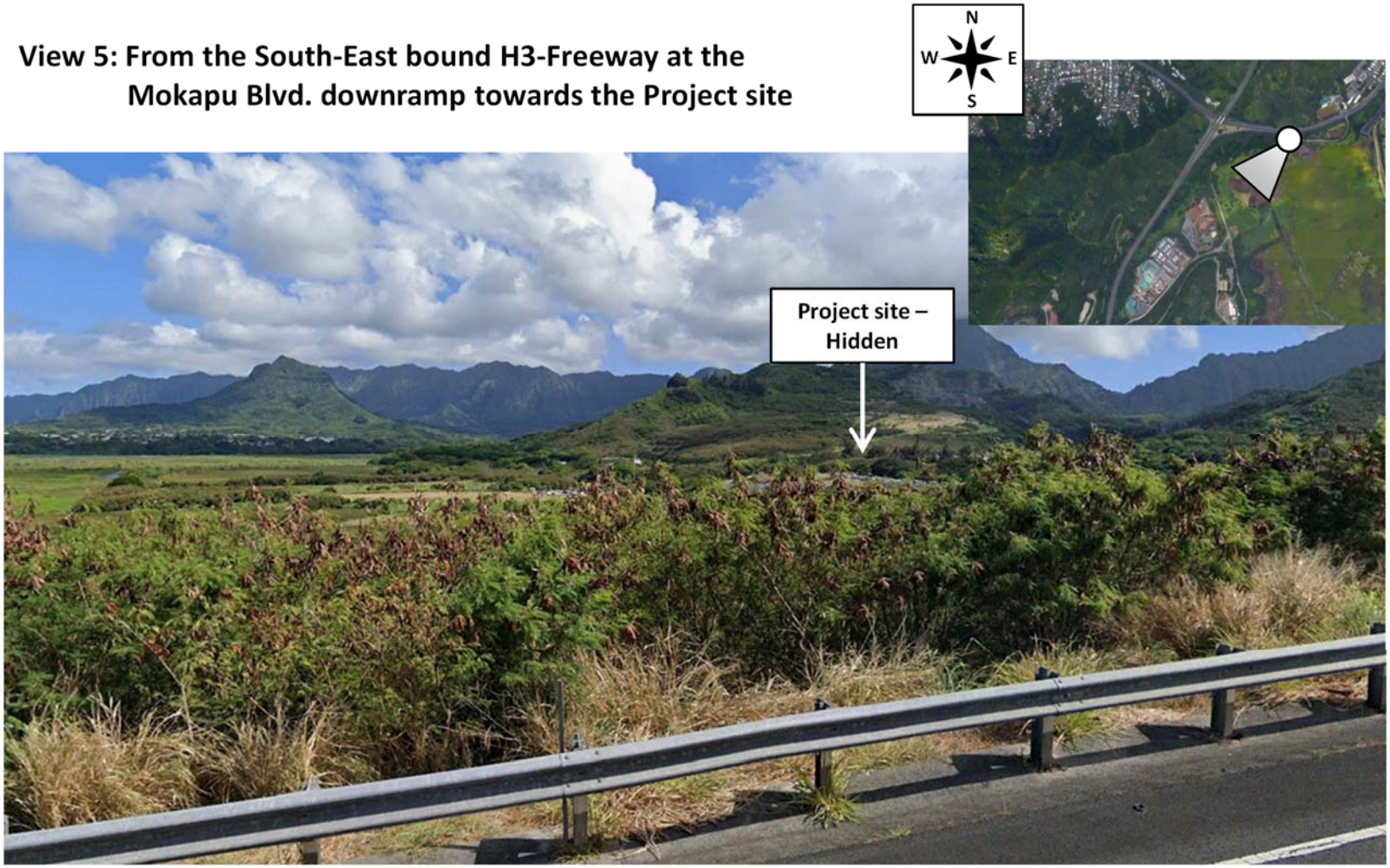


Figure 6.6.2.5: View 5 - From the South-East bound H3-Freeway at the Mokapu Avenue offramp towards the project site:

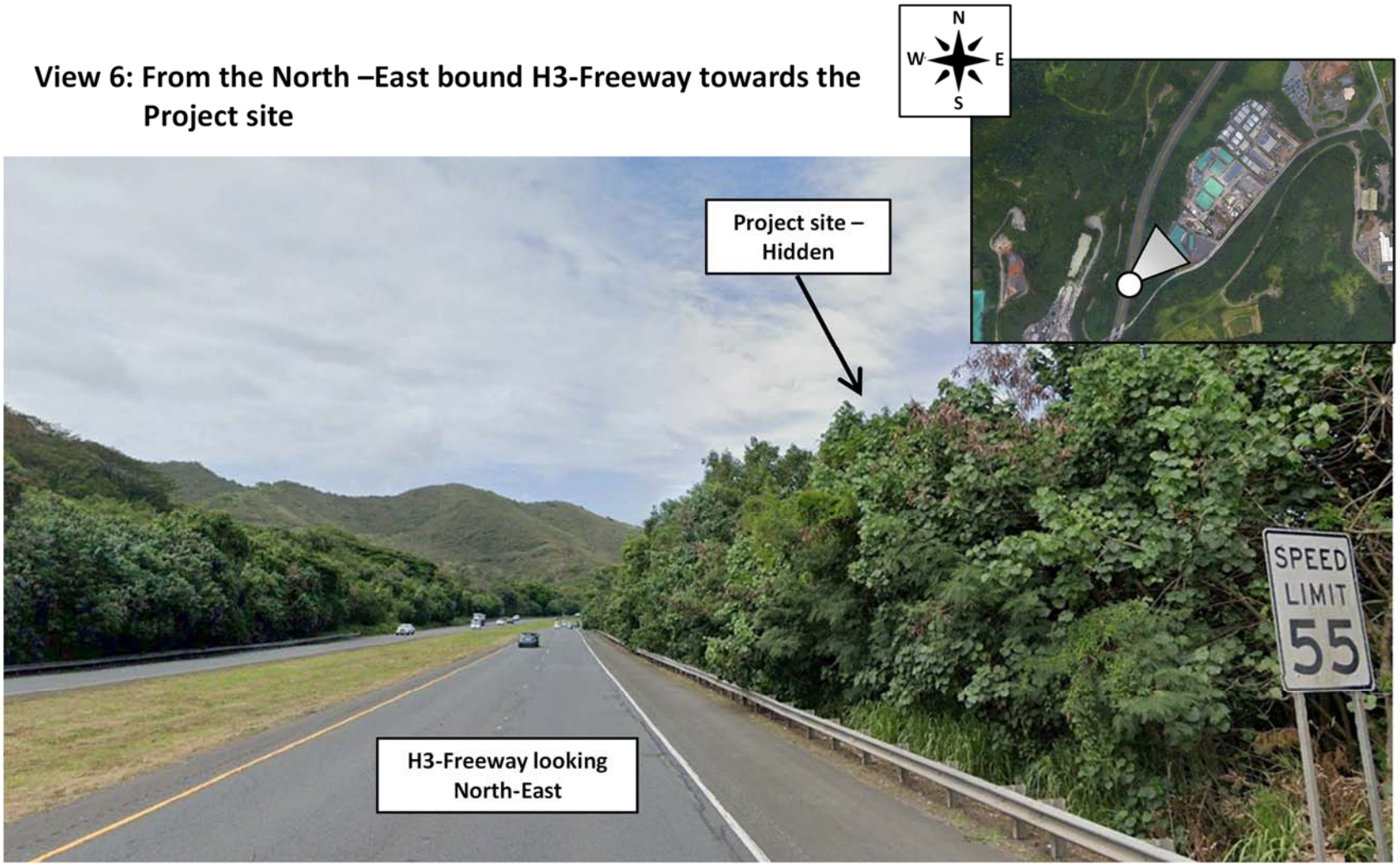


Figure 6.6.2.6: View 6 – From the North-East bound H3-freeway towards the project site

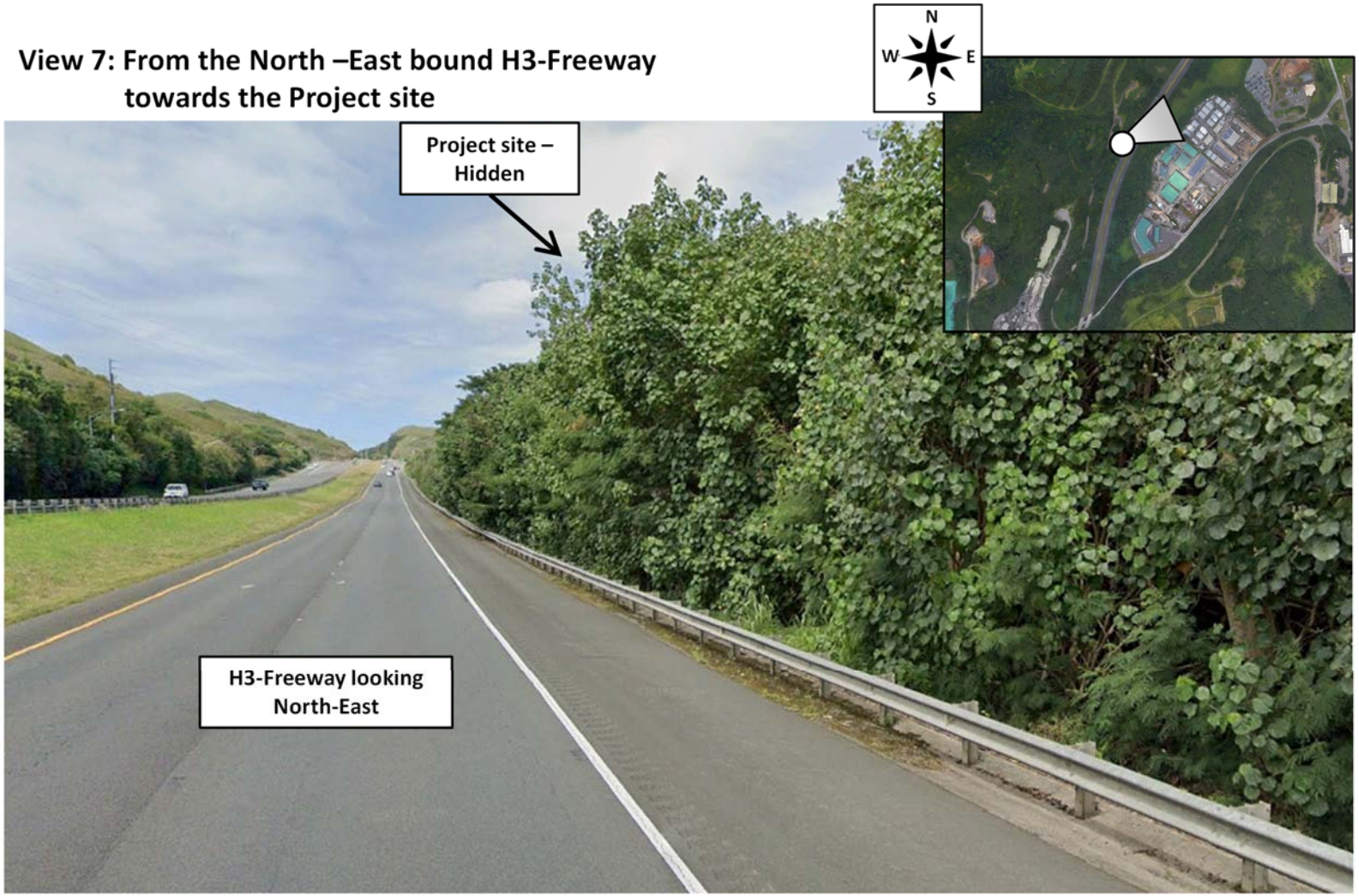


Figure 6.6.2.7: View 7 – From the North-East bound H3-freeway towards the project site

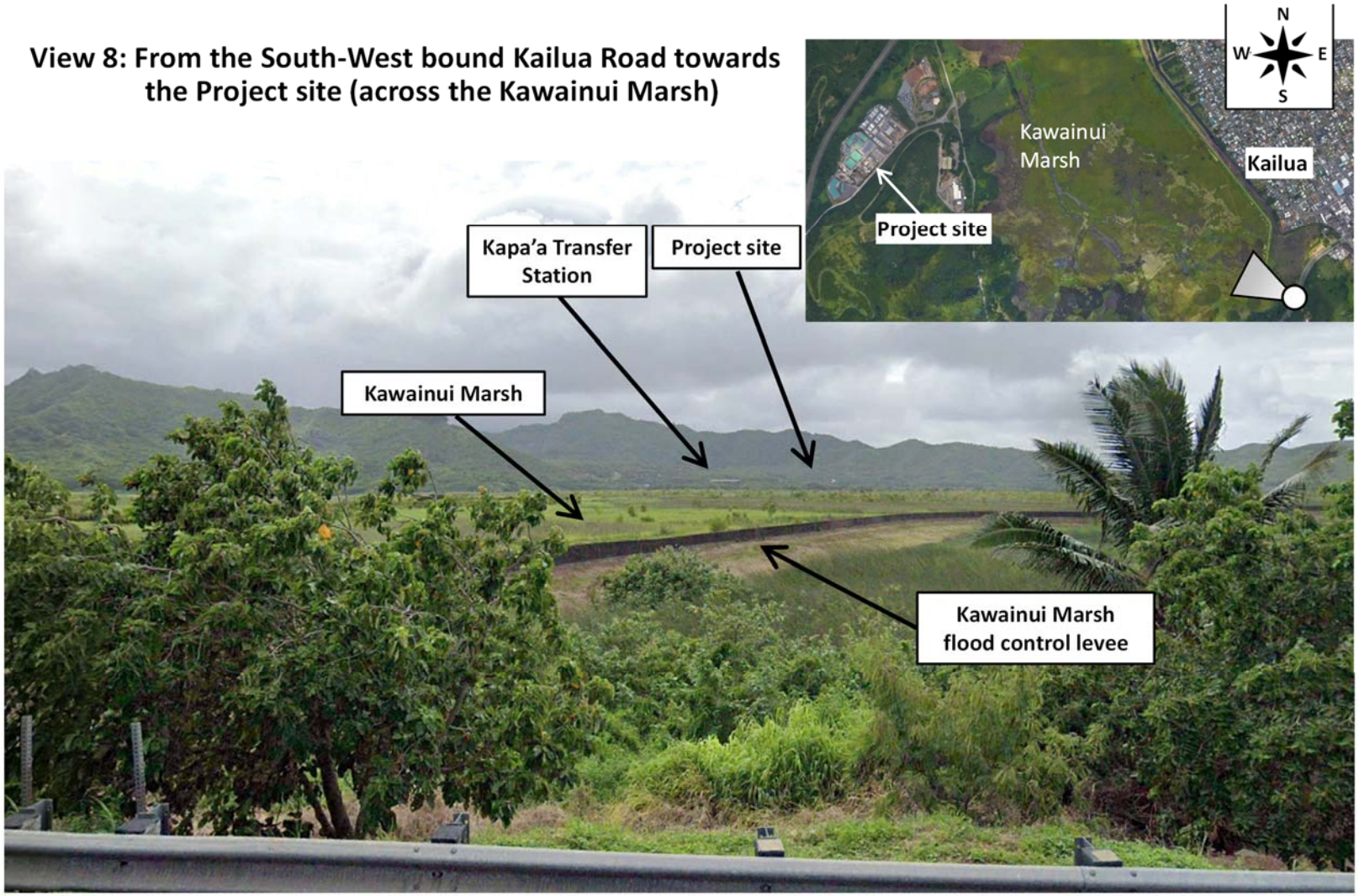


Figure 6.6.2.8 – View 8 from South bound Kailua Road towards the project site

As an example of effective visual impact mitigation for long-distance views using color scheme is presented in Appendix G. Examples of the effectiveness of using color schemes are presented in Figures 6.6.2.9 and 6.6.2.10.

The effectiveness of using color to hide buildings across the Kawainui Marsh is illustrated by looking at the impression of the existing Kapa'a Transfer Station. Figure 6.6.2.9 shows the existing appearance of the transfer station building façade and roof, with roof and façade clearly visible. In comparison, Figure 6.6.2.10 shows a simulated color scheme for the building façade and roof color, with colors selected from the surrounding land. The comparison of Figures 6.6.2.9 and 6.6.2.10 shows the effectiveness of using color to reduce visual impact for distant views by blending the building within the landscape.

Figure 6.6.2.9: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **A = Existing colors** for the building façade and roof (This figures was added to the DSESI; refer to Appendix G)

Figure 6.6.2.10: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **B = Simulated colors** for the building façade and roof; single color schemes for façade and roof were chosen to blend into the background (R,G,B values were taken from the vegetated background) (This figures was added to the DSESI; refer to Appendix G)

6.6.3 Visual Impact Assessment of Adjacent View planes Using Photographic Images

This section assesses visual impressions of observers experienced by adjacent views on the Proposed Action. This visual impact assessment uses photographic images showing the current condition. This section presents 15 representative adjacent view planes, which have significance since they may affect observers travelling past the project site on the Kapa'a Quarry Road and Kapa'a Quarry Place roadways. Table 6.6.3.1 describes depictions of view planes that are shown in in Figures 6.6.3.1 through 6.6.3.16. Table 6.6.3.1 provides short discussions about the expected visual impressions of observers.

Conclusions: The adjacent views A through H illustrated in Figures 6.6.3.2 through 6.6.3.10 suggest that the present Lower portion of project site is mostly hidden from views by observers passing the site by an existing dense vegetated screen of scrubs and trees of various heights. Views I through N illustrated in Figures 6.6.3.11 through 6.6.3.12 show visual impressions of the Upper site. The existing Upper site has a smaller site perimeter with plants and has no vegetated berms. Observers passing the Upper site on the Kapa'a Quarry Place represent a small fraction of the traffic passing the project site, since they typically include only those observers who visit businesses in the Upper sites or drive to the Ameron quarry farther uphill in the Kapa'a valley.

It is projected that by constructing vegetated perimeter berms around the New development in the Lower site, the visual impact will be mitigated effectively. It is further projected that the future visual impression of the Lower site will not significantly deviate from the present impressions, provided that a suitable vegetated screen is planted on the site perimeter berms.

The new development in the Upper site will be more visible from the immediate surrounding than before, due to the New buildings Nos. 32 through 35 to be constructed right next to the Kapa'a Quarry Place roadway. View J showing the recently completed Building No. 31 provides an idea of the future visual impression.

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
6.6.3.1	Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes A through F	The adjacent view planes 6.6.3.2 to 6.6.3.7 show the visual impressions an observer has traveling North bound on the Kapa'a Quarry Road. The views 6.6.3.2 to 6.6.3.7 are representative for traffic between Mokapu Avenue and Kalanianaole Blvd., which represents the main portion of traffic using the Kapa'a Quarry Road.
6.6.3.2	View A – From the North bound Kapa'a Quarry Road towards the Project site: The	Figure 6.6.3.2 gives the visual impression of an observer approaching the site coming

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	project site (Lower site) is straight ahead, hidden behind a dense screen of larger trees.	from Kalanianaole Blvd. The Lower portion of the site is indicated behind existing tall trees, straight ahead.
6.6.3.3	View B – From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is straight ahead to the left, hidden behind a dense screen of larger trees.	Figure 6.6.3.3 shows the visual impression of an observer passing the road triangle of the Kapa'a Quarry coming from Kalanianaole Blvd. with the project site on the left. The Lower portion of the site is indicated behind existing tall trees, straight ahead.
6.6.3.4	View C - From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the left, hidden behind a dense screen of medium height trees.	Figure 6.6.3.4 shows the visual impression of an observer passing the Lower site North bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the left.
6.6.3.5	View D - From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the left, hidden behind a dense screen of medium height trees.	Figure 6.6.3.5 shows the visual impression of an observer passing the Lower site North bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the left. In the foreground, as indicated is a previous drainage ditch which is now overgrown and filled with soil.
6.6.3.6	View E - From the South bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the right, hidden behind a dense screen of medium height trees.	Figure 6.6.3.6 shows the visual impression of an observer passing the Lower site South bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the right. To the right and at a larger different from the road than shown in Figure 6.6.3.5, as indicated, is a previous drainage ditch which is now overgrown and filled with soil.
6.6.3.7	View F - View F: From the North-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is straight ahead, hidden behind existing perimeter berms. The existing perimeter	Figure 6.6.3.7 shows the visual impression of an observer approaching the project site on one the Southern leg of the traffic triangle of the Kapa'a Quarry Place. The existing

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	berms have vegetation of short trees and scrubs.	Eastern roadway access to the Lower site is straight on.
6.6.3.8	Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes G through N	The adjacent view planes 6.6.3.8 to 6.6.3.16 show the visual impressions an observer has traveling South West bound on the Kapa'a Quarry Place. Typically, traffic on the Kapa'a Quarry Place is to access the Kapa'a Light Industrial Park of the Ameron Quarry further uphill n Kapa'a Valley.
6.6.3.9	View G - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is straight ahead to the right, hidden behind existing perimeter berms. The existing perimeter berms have vegetation of short trees and scrubs.	Figure 6.6.3.9 shows the visual impression of an observer passing the Lower site South-West bound on the Kapa'a Quarry Road, driving towards the Upper site. The Lower site is hidden behind an existing perimeter berm.
6.6.3.10	View H - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is to the right, hidden behind existing perimeter berms.	Figure 6.6.3.10 shows the visual impression of an observer passing the Lower site South-West bound on the Kapa'a Quarry Road, driving towards the Upper site. The Lower site is to the right hidden behind an existing perimeter berm with vegetation. The Western road access to the Lower site to the right, as indicated.
6.6.3.11	View I - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right, hidden behind an existing landscaped site perimeter berm.	Figure 6.6.3.11 shows the visual impression of an observer South-West bound on the Kapa'a Quarry Road, passing the beginning of the Upper site. A landscaped perimeter berm which surrounds the Upper site is on the right. The landscaping offers a welcoming view of the Kapa'a Light Industrial Park.
6.6.3.12	View J - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the	Figure 6.6.3.12 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site with the New Building No. 31 on

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	right. The new Building No. 31 and a landscaped perimeter is to the right.	the right. A recently upgraded landscaped perimeter strip has been recently filled with emerging plants.
6.6.3.13	View K - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right.	Figure 6.6.3.13 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site on the right. On the right side is a retaining wall, made of natural stones, with a landscaped perimeter strip between the wall and the road.
6.6.3.14	View L - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right with the existing roadway access connecting Buildings 50 and 51 with the roadway.	Figure 6.6.3.14 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site on the right. On the right side is the Western end of the retaining wall. The existing roadway access is on the right side, which provides access to the buildings 50 and 51. The roadway access was upgraded by removing quantities of vegetation to provide a better sight distance situation.
6.6.3.15	View M: From the South-West bound Kapa'a Quarry Place towards the Project site: The Upper site with Buildings 50 and 51 is on the right.	Figure 6.6.3.15 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing existing buildings 50 and 51.
6.6.3.16	View N: From the South-West bound Kapa'a Quarry Place towards the Project site: The Western border of the Upper site with Building 50 is on the right.	Figure 6.6.3.16 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing existing Buildings 50. The existing infiltration and detention basin are indicated adjacent and to the West of Building 50.

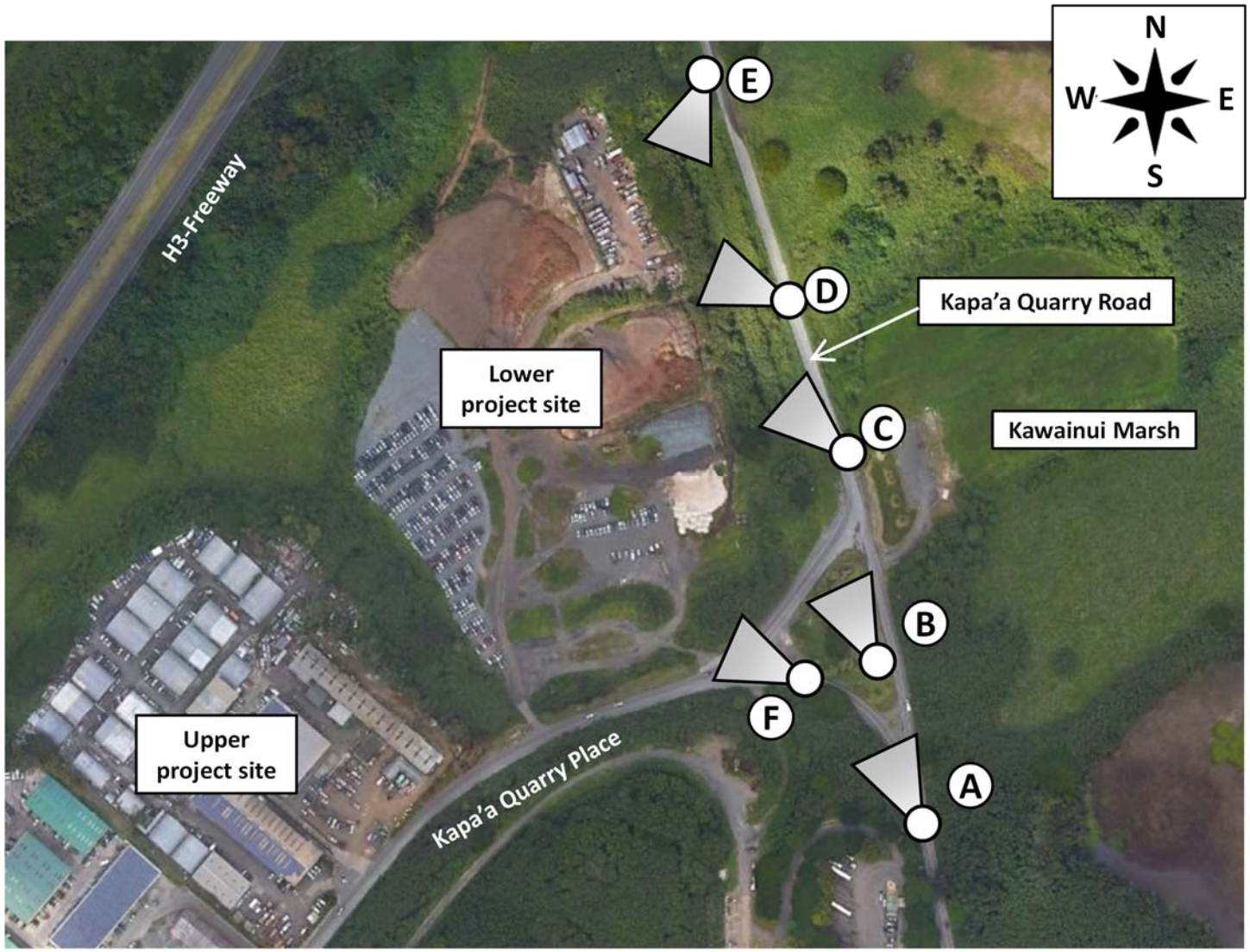


Figure 6.6.3.1: Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes A through F

View A: From the North bound Kapa'a Quarry Road towards the Project site

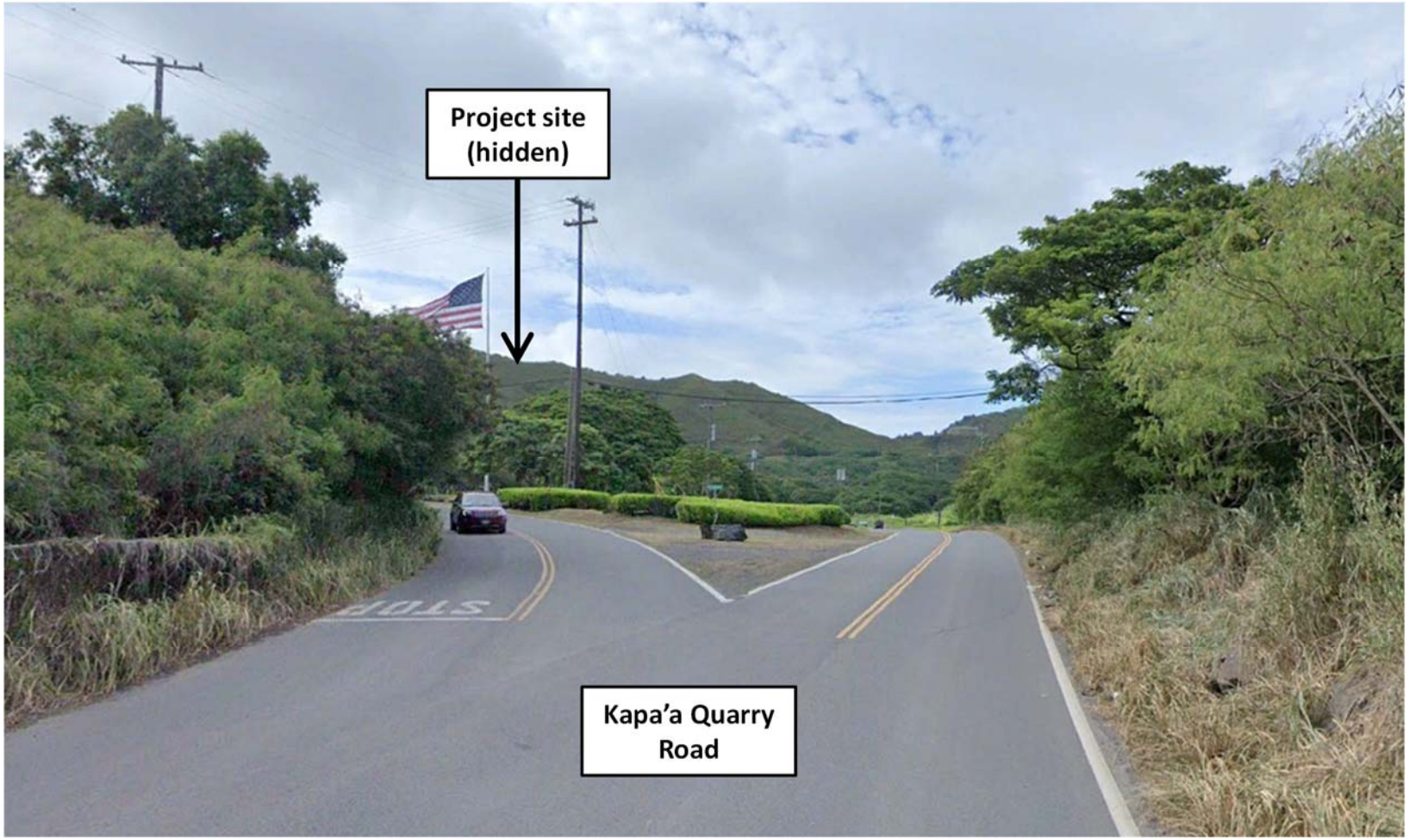


Figure 6.6.3.2: View A – From the North bound Kapa'a Quarry Road towards the Project site:

View B: From the North bound Kapa'a Quarry Road towards the Project site

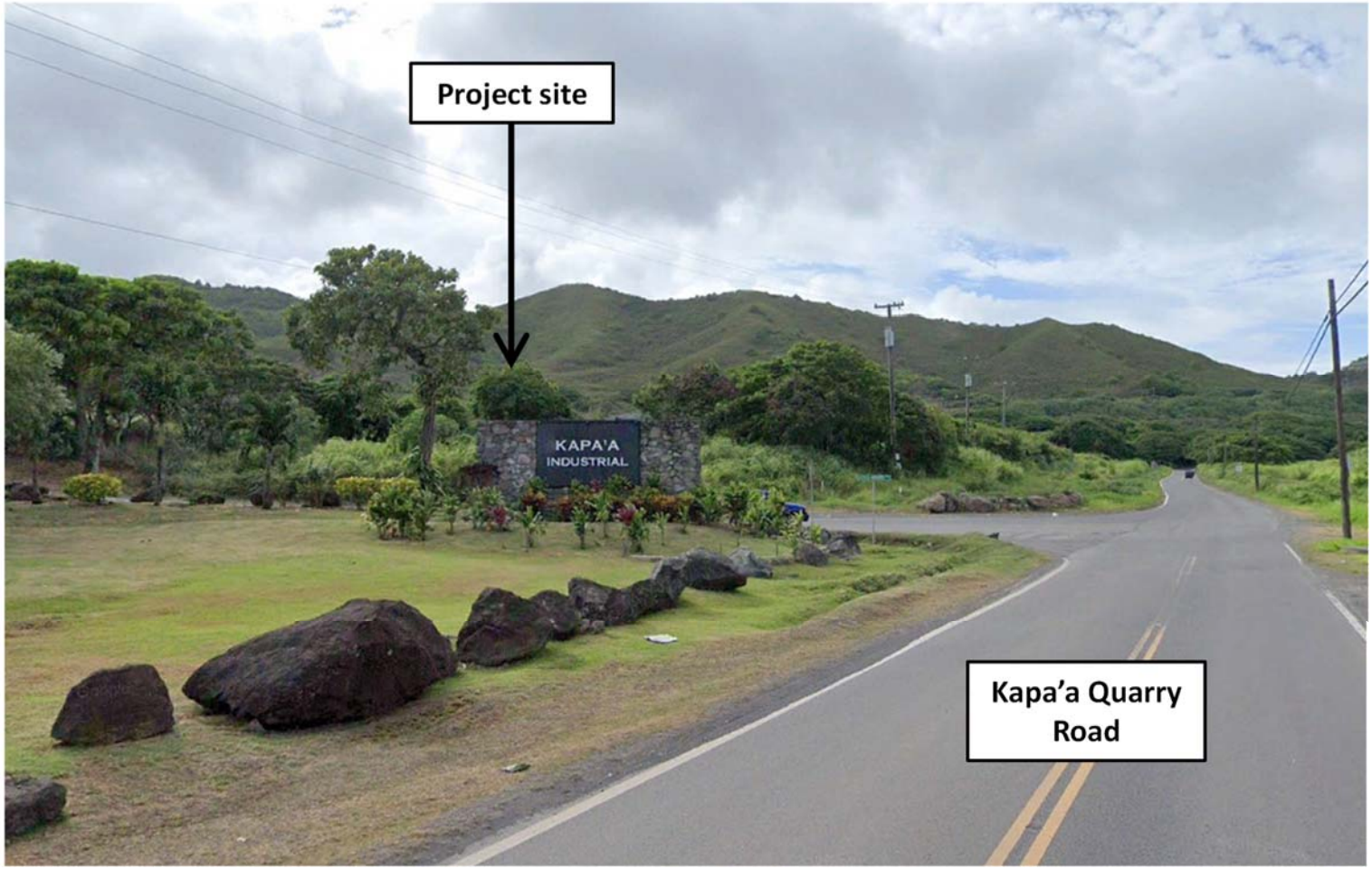


Figure 6.6.3.3: View B – From the North bound Kapa'a Quarry Road towards the Project site

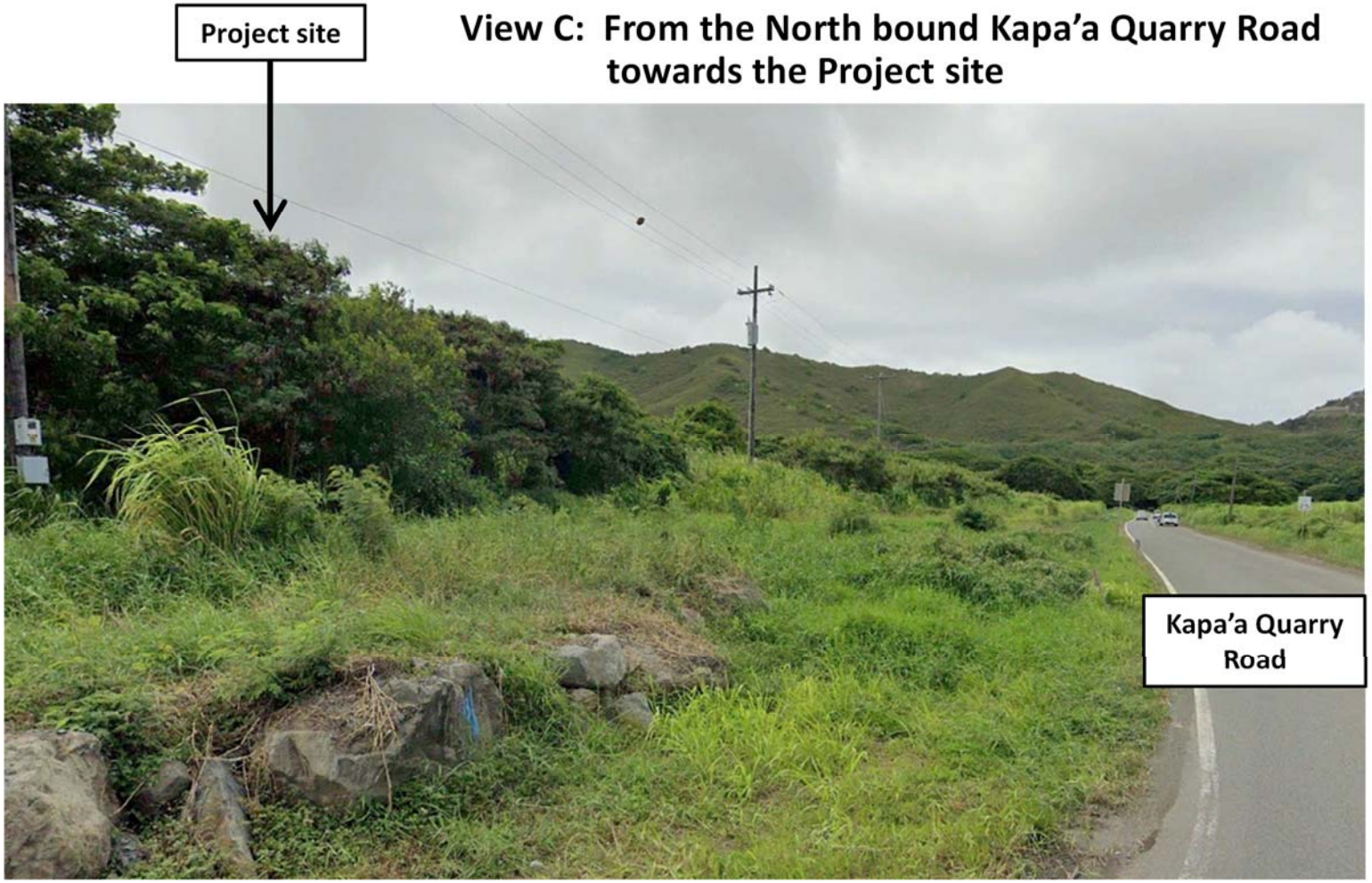


Figure 6.6.3.4: View C - From the North bound Kapa'a Quarry Road towards the Project site

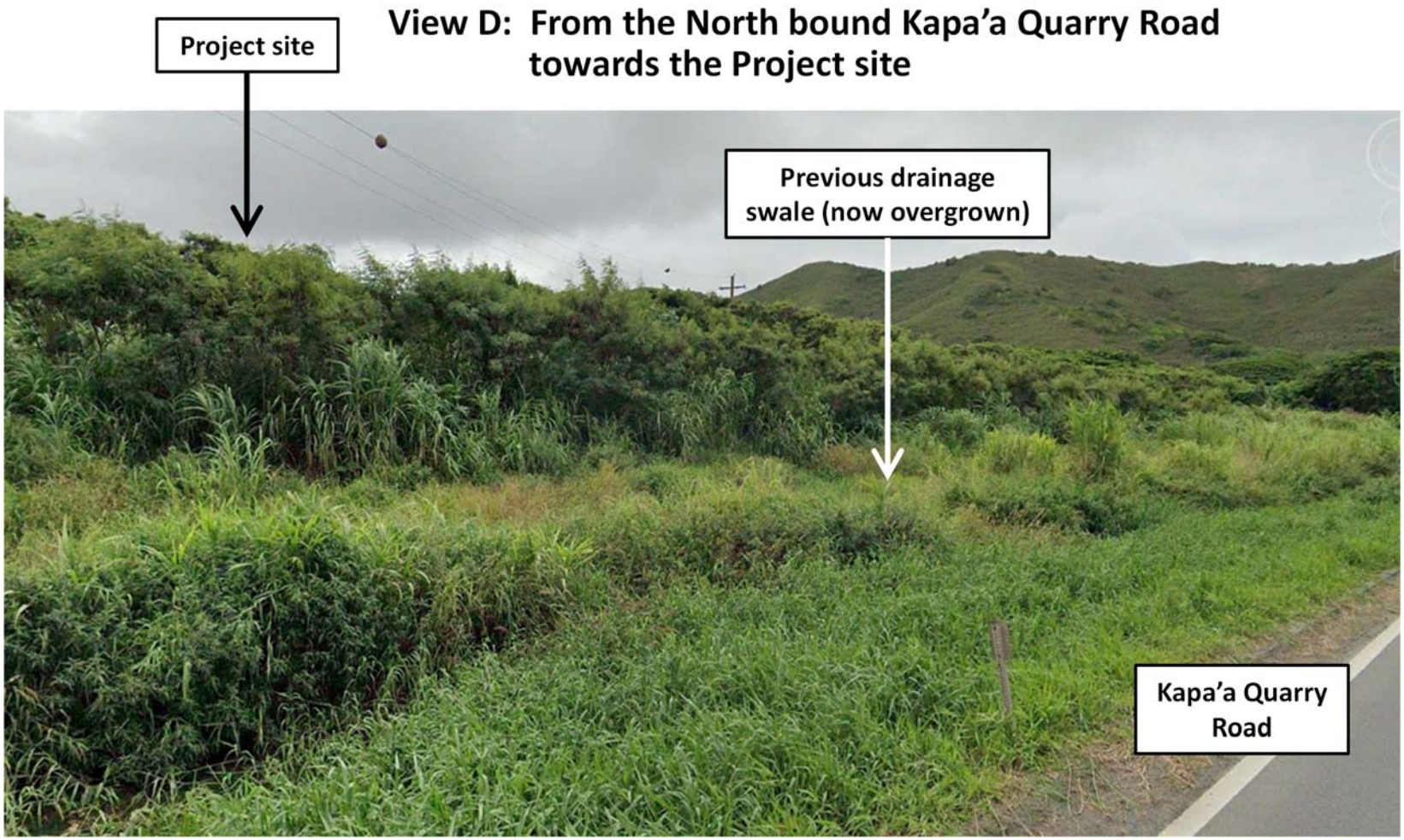


Figure 6.6.3.5: View D - From the North bound Kapa'a Quarry Road towards the Project site

View E: From the South bound Kapa'a Quarry Road towards the Project site

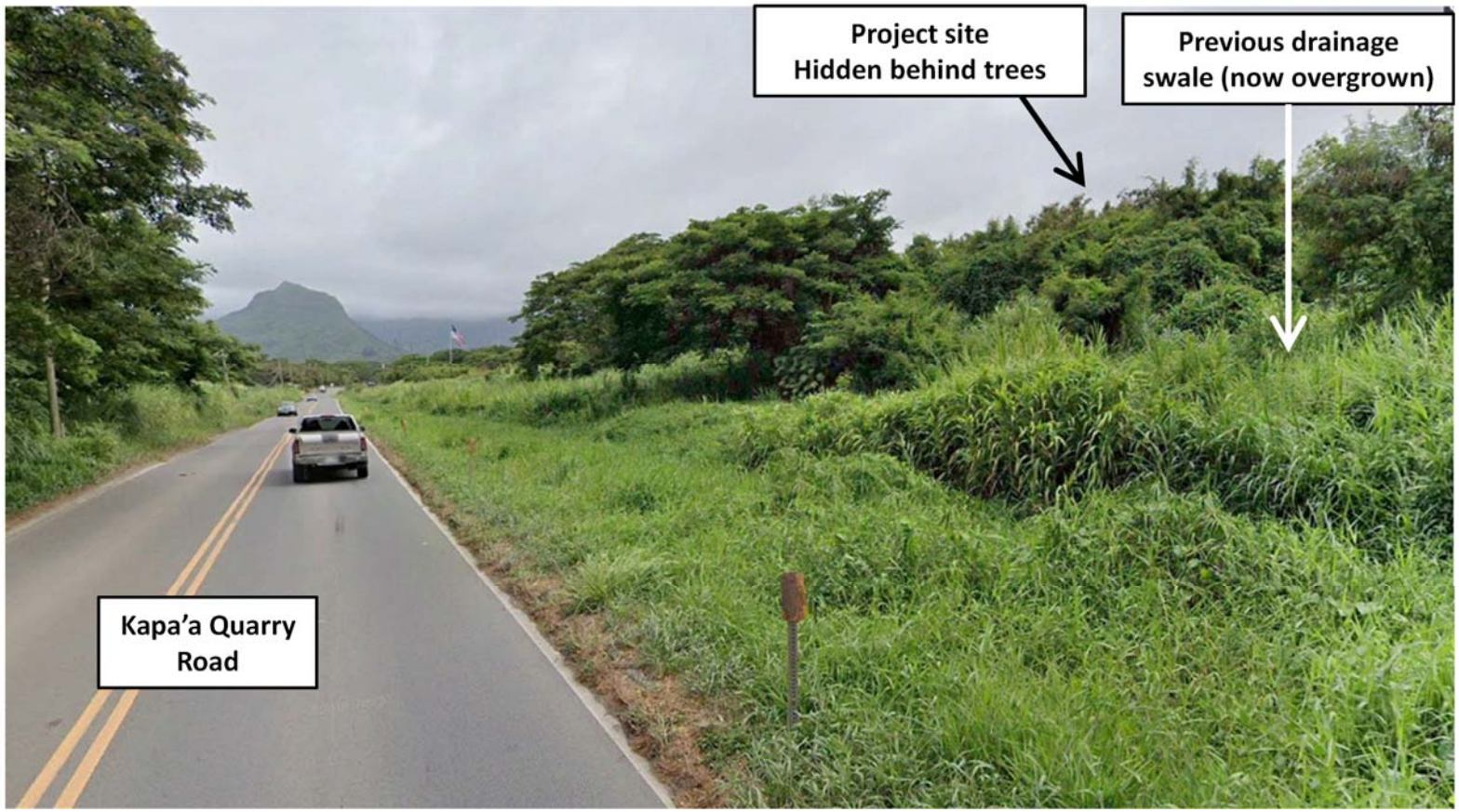


Figure 6.6.3.6: View E - From the South bound Kapa'a Quarry Road towards the Project site

View F: From the North-West bound Kapa'a Quarry Place towards the Project site

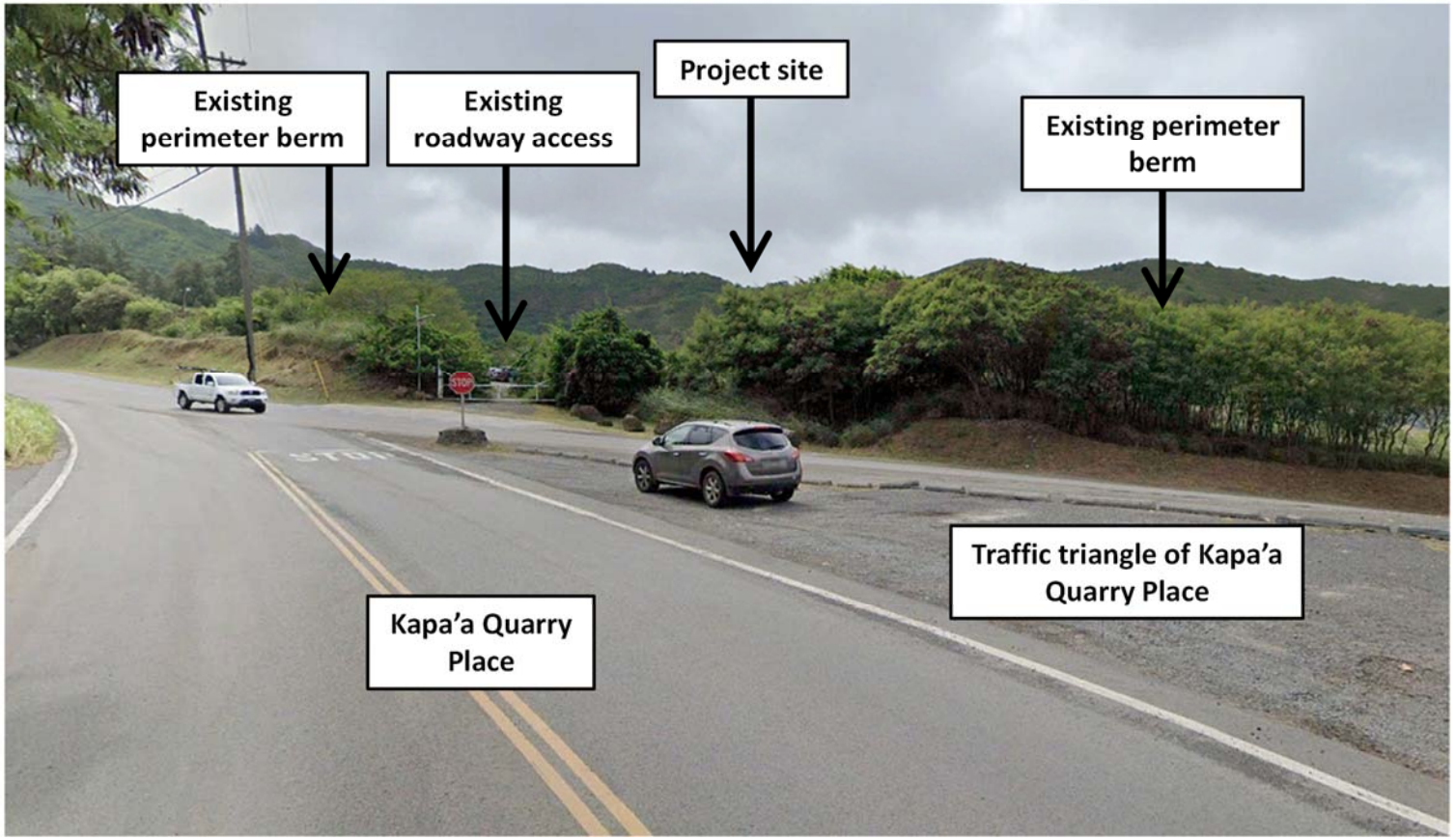


Figure 6.6.3.7: View F - View F: From the North-West bound Kapa'a Quarry Place towards the Project site

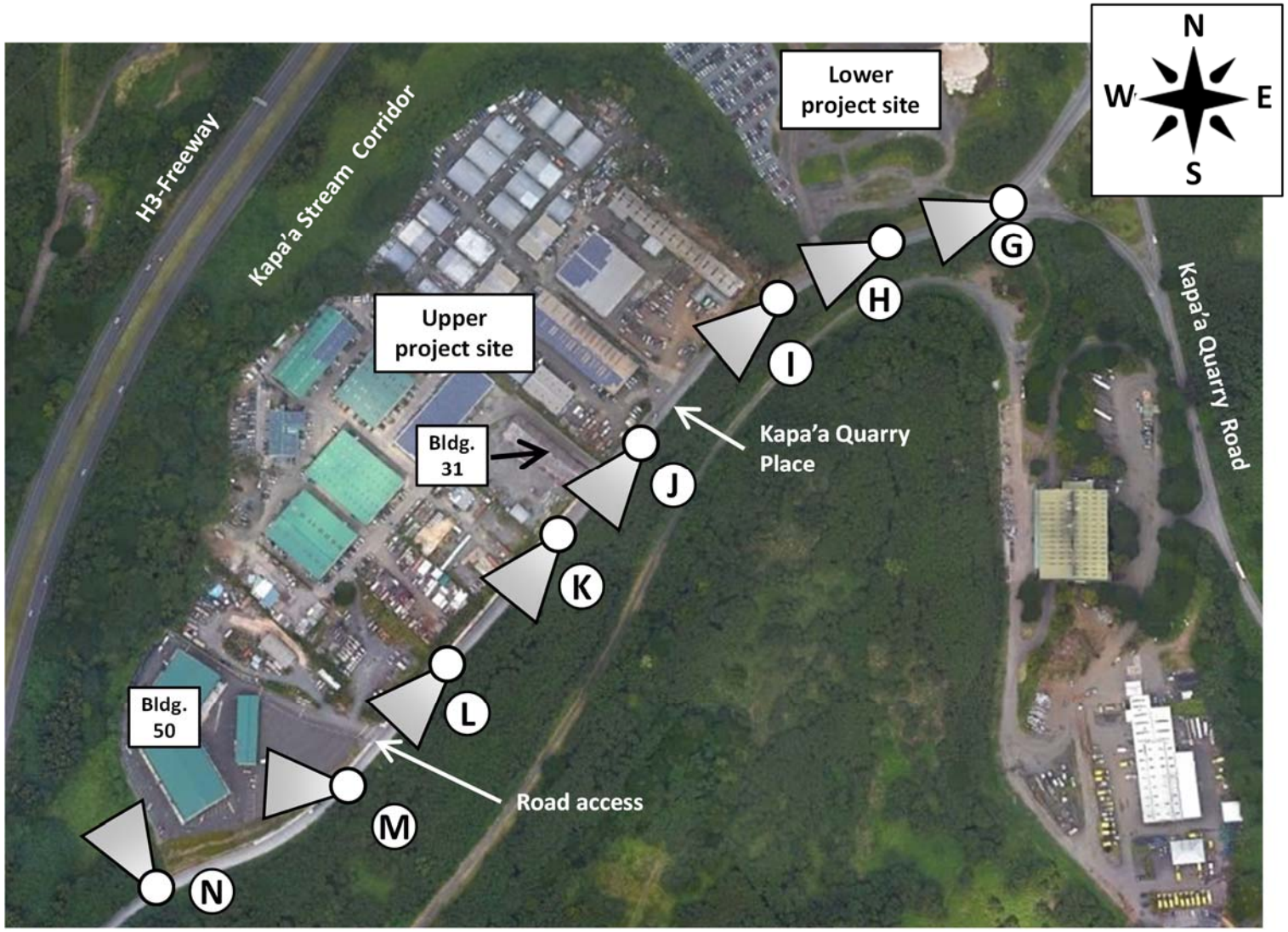


Figure 6.6.3.8: Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes G through N

View G: From the South-West bound Kapa'a Quarry Place towards the Project site

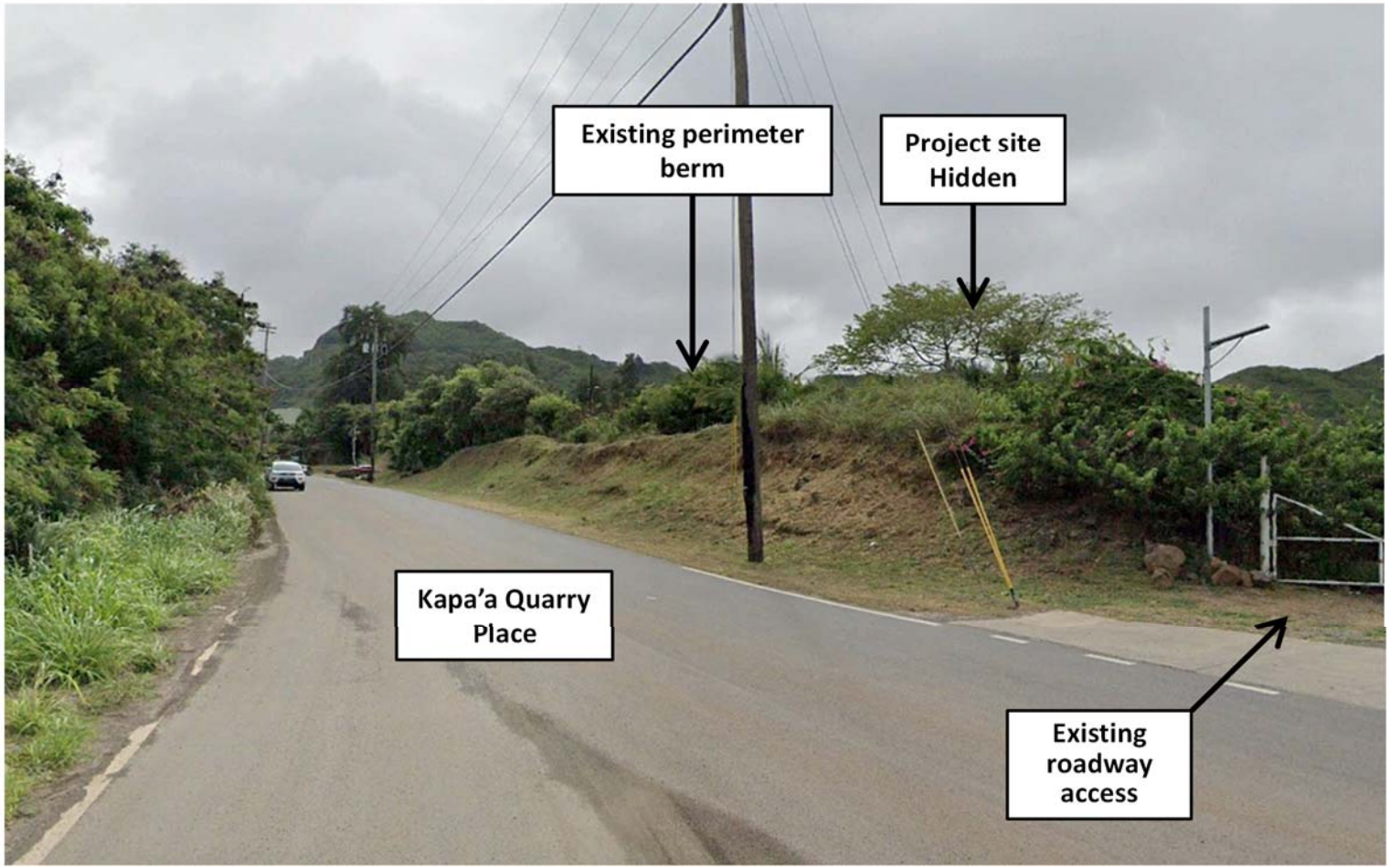


Figure 6.6.3.9: View G - From the South-West bound Kapa'a Quarry Place towards the Project site

View H: From the South-West bound Kapa'a Quarry Place towards the Project site

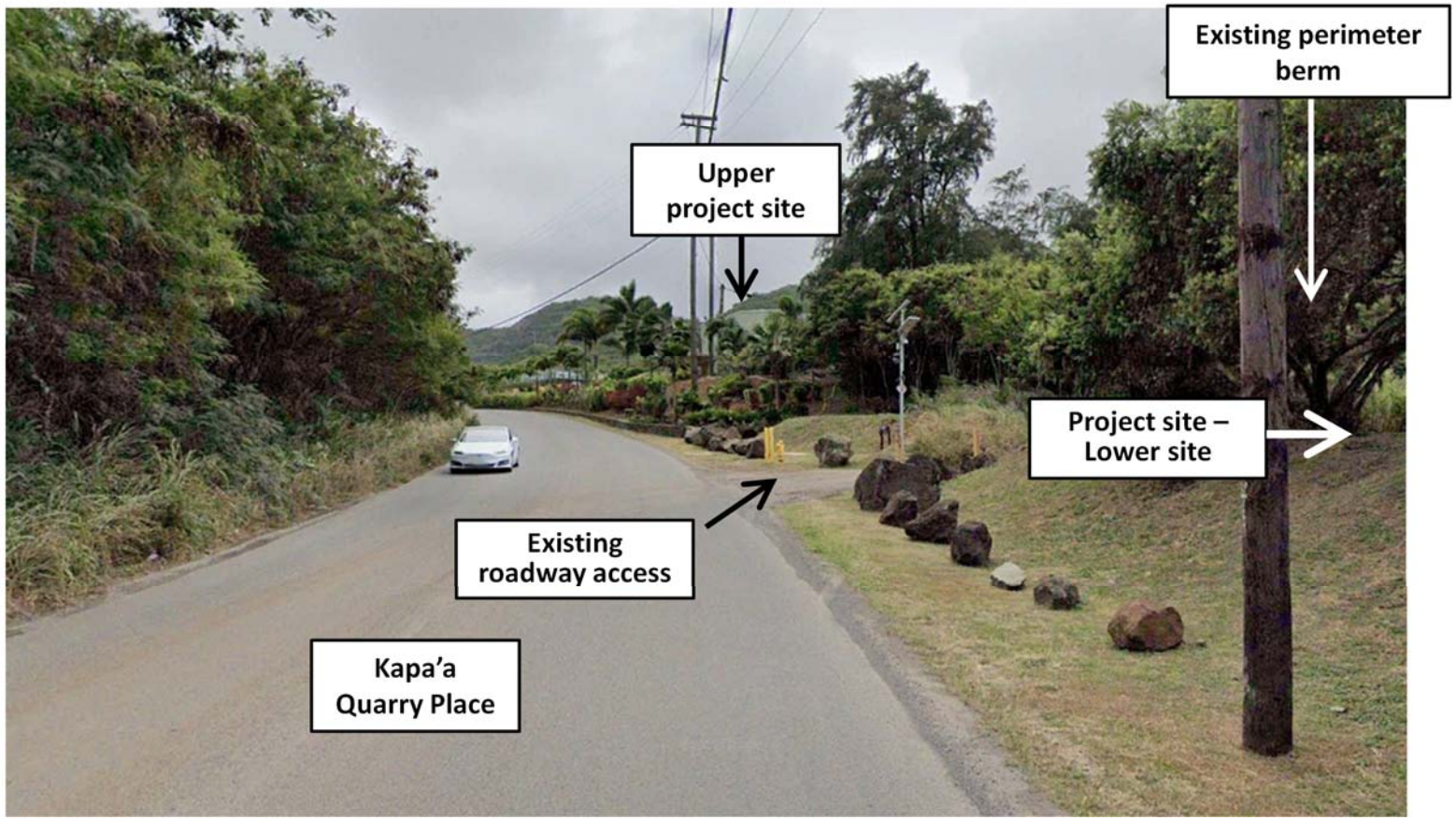


Figure 6.6.3.10: View H - From the South-West bound Kapa'a Quarry Place towards the Project site

View I: From the South-West bound Kapa'a Quarry Place towards the Project site

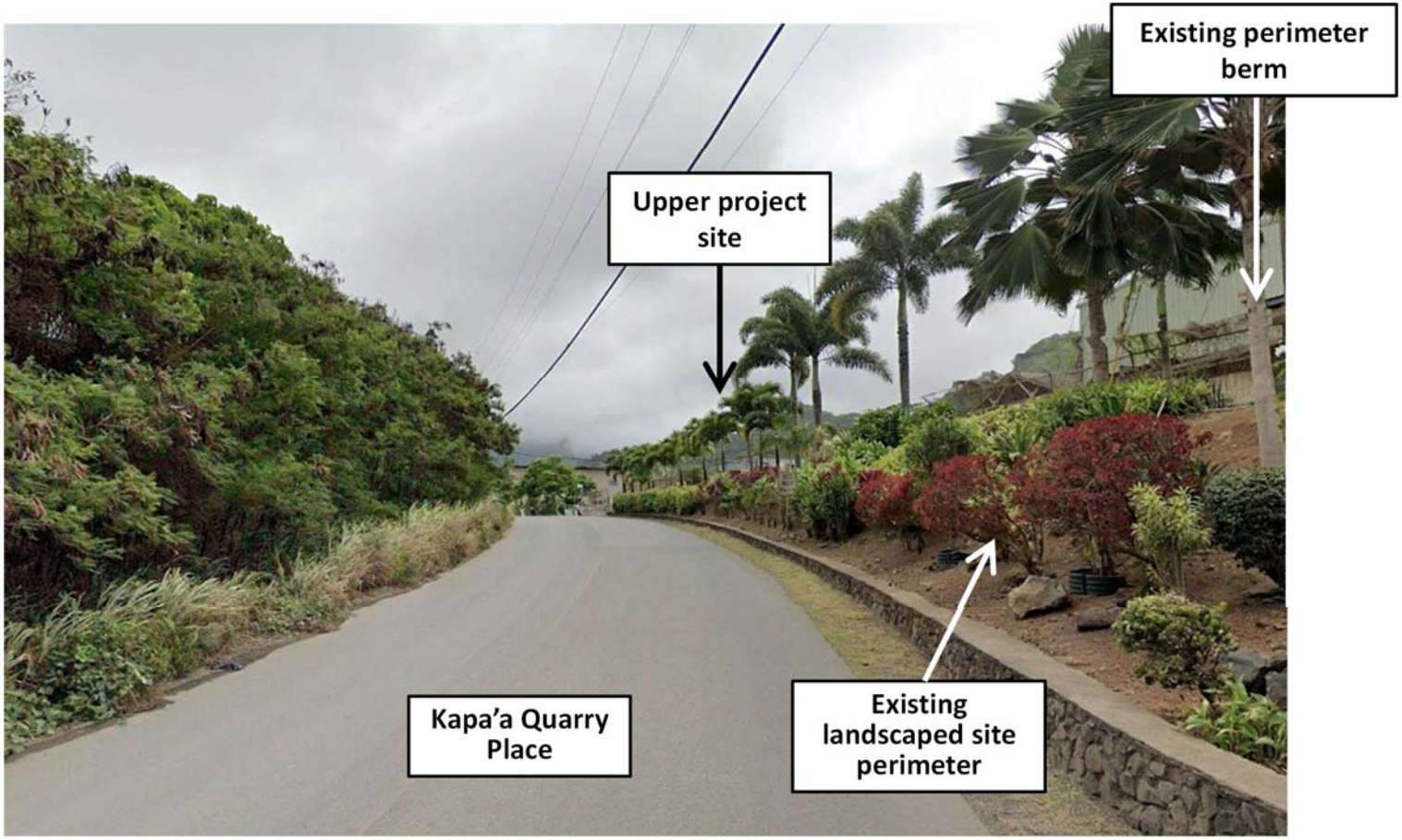


Figure 6.6.3.11: View I - From the South-West bound Kapa'a Quarry Place towards the Project site

View J: From the South-West bound Kapa'a Quarry Place towards the Project site

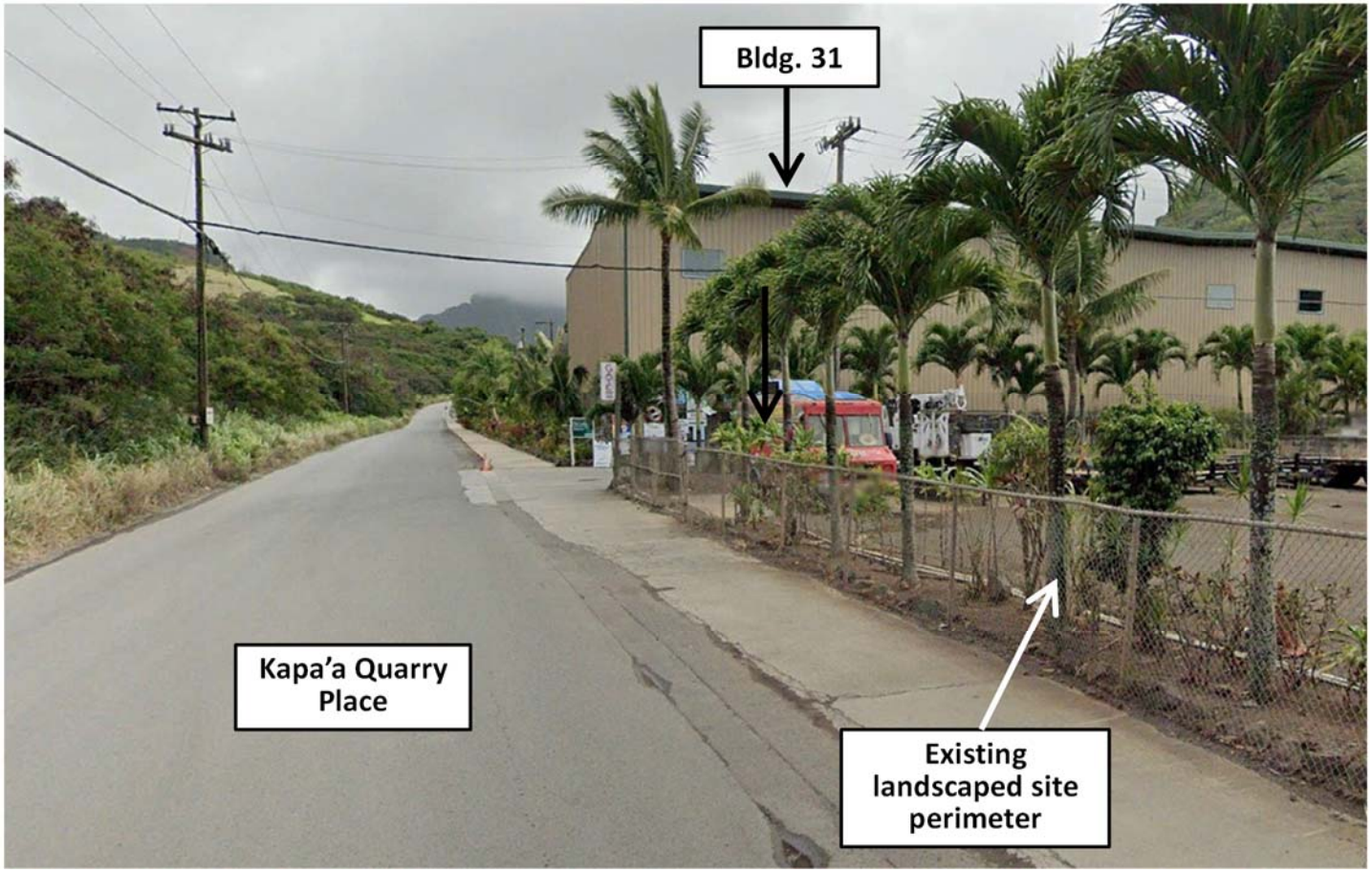


Figure 6.6.3.12: View J - From the South-West bound Kapa'a Quarry Place towards the Project site

View K: From the South-West bound Kapa'a Quarry Place towards the Project site

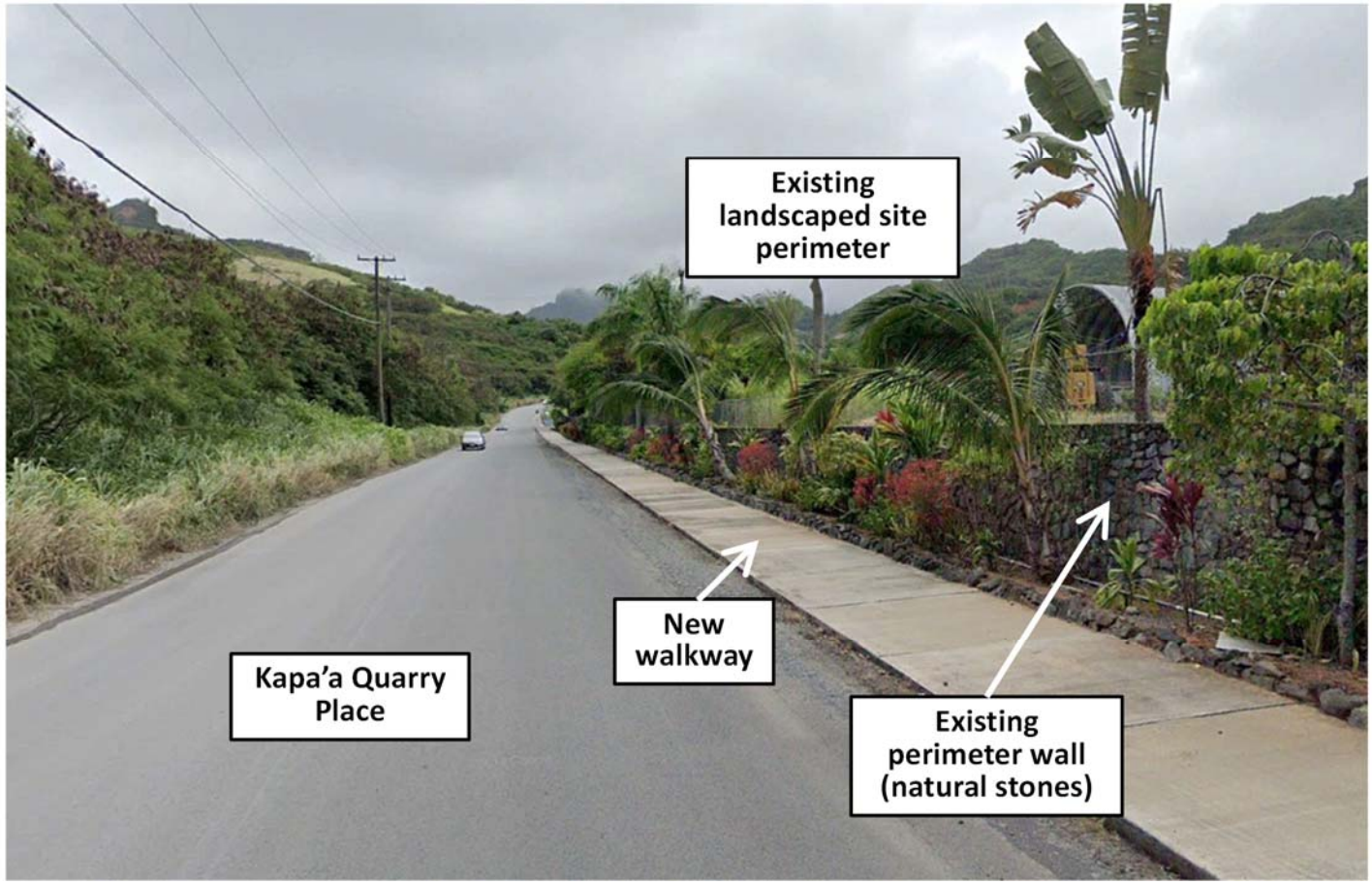


Figure 6.6.3.13: View K - From the South-West bound Kapa'a Quarry Place towards the Project site

View L: From the South-West bound Kapa'a Quarry Place towards the Project site

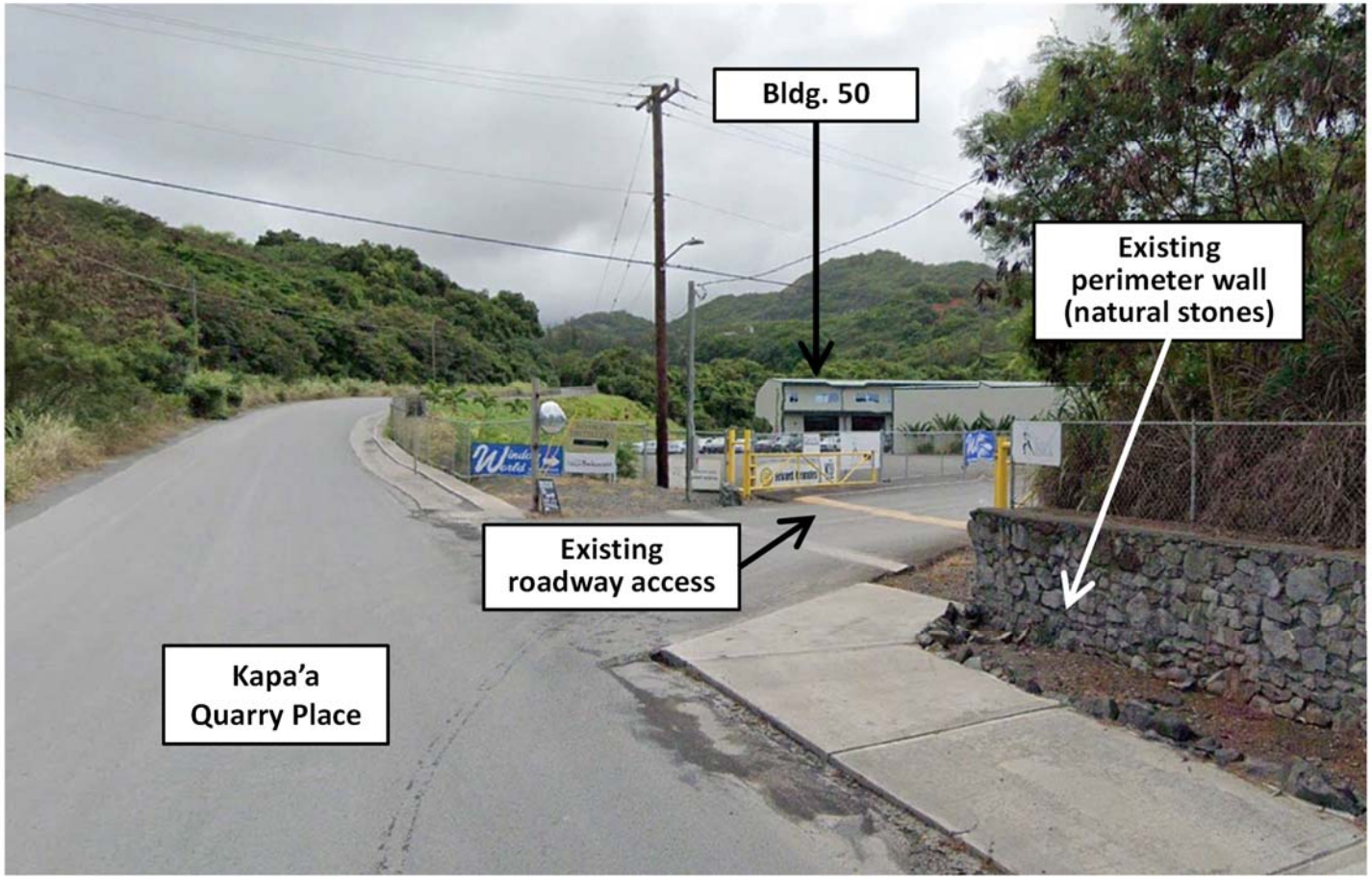


Figure 6.6.3.14: View L - From the South-West bound Kapa'a Quarry Place towards the Project site

View M: From the South-West bound Kapa'a Quarry Place towards the Project site

Figure 6.6.3.15: View M: From the South-West bound Kapa'a Quarry Place towards the Project site

View N: From the South-West bound Kapa'a Quarry Place towards the Project site

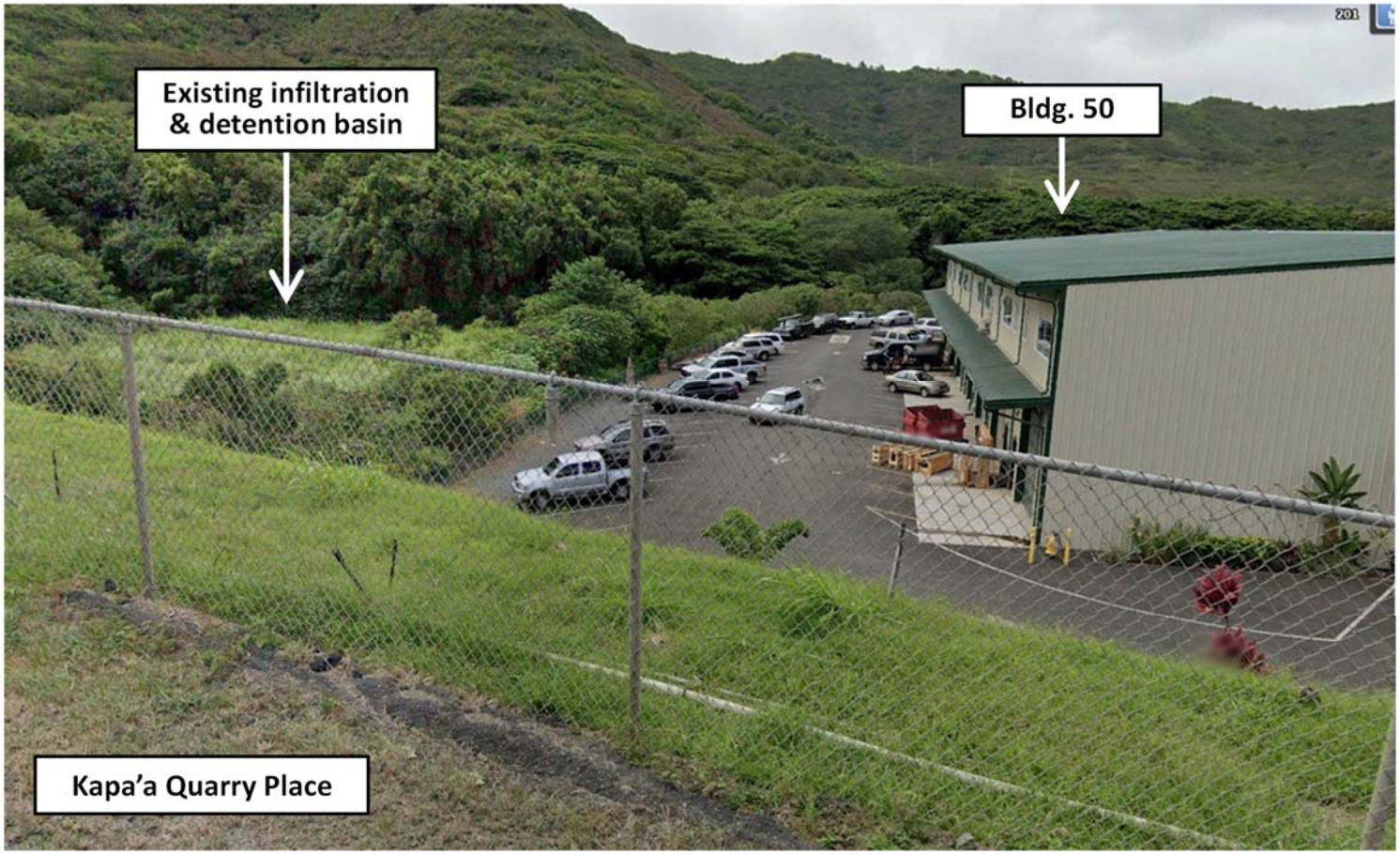


Figure 6.6.3.16: View N: From the South-West bound Kapa'a Quarry Place towards the Project site

6.6.4 Visual Impact Assessment of Adjacent View Planes Using Line Drawings of Lines of Sight

This section shows 6 representative cross sections through the site perimeter berms under the new development in the Lower site. The line drawings illustrate the expected lines of sights of an observer inside a car passing the Lower site on the Kapa'a Quarry Road. The line-of-sight assessment illustrates how the views should be affected by the New site perimeter berms and how effective the planned trees and shrubs on the top and exterior side of the site perimeter berm will likely be in shielding the new warehouses form exterior view. Generally, if the warehouse structure is below the line of sight, the warehouse would be visible to the observer.

For this analysis of line-of-sight illustrations three sample trees with different heights are used to indicate the effectiveness of obstructing lines of sight by these trees. The line of sight that passes above a particular type of a sample tree indicates the minimum height of visual obstructions that is required to completely hide warehouse structures from observers on the Kapa'a Quarry Road and the Lower portion of the Kapa'a Quarry Place. While the cross sections show trees as visual barriers, it is understood that shrubs are equally important to be planted in the perimeter berm to establish the desired dense vegetation cover. And while the vegetation will be effective to provide visual impact mitigation, a dense vegetation cover will also mitigate noise and fugitive impact mitigation, as well as provide good soil erosion prevention.

Conclusions: The 6 representative cross sections A through F indicate that visual impact mitigation is possible by adding trees of different on the New site perimeter berms. For three cross sections along the Kapa'a Quarry Road and one cross section on the Lower portions of the Kapa'a Quarry Place 10 feet high trees will obstruct line of sights on the warehouses in the Lower site closest to the roadways. For the most northern cross section 15-foot trees would be required for complete visual impact mitigation. For this cross section there are existing trees between the roadway and the new perimeter berm which already provide good visual impact mitigation.

Appendix G presents a visual impact assessment using cross-sections in more detail.

Figure	Description of visual impact cross sections and effectiveness to visual impact mitigation measures
6.6.4.1	Overview of the visual impact sections A through F of the perimeter berms around the Lower site
6.6.4.2	Visual impact section A: The cross section shows the lines of sight of an observer passing the New Lower site development on the East bound Kapa'a Quarry Place. The New site perimeter berm is low at this location, with the finish grade some 4 feet below the elevation of the Kapa'a Quarry Place roadway. As indicated in Figure 6.6.4.2, trees with a crown height of at least 15 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Trees with heights below 15' would only provide partial visual shielding .
6.6.4.3	Visual impact section B: The cross section shows the lines of sight of an observer passing the New Lower site development on the East bound Kapa'a Quarry Place. The New site perimeter berm has a height of 14 feet at this location, with the finish grade of the site at an

Figure	Description of visual impact cross sections and effectiveness to visual impact mitigation measures
	elevation of 42 feet. As indicated in Figure 6.6.4.3 trees with a crown height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible from a car passing the location on the road.
6.6.4.4	Visual impact section C: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. As indicated in Figure 6.6.4.4 , trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 25% of the warehouse structure would be visible by the observer.
6.6.4.5	Visual impact section D: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway with the former drainage ditch and a maintenance dirt road between the roadway and perimeter berm. As indicated in Figure 6.6.4.5, trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible by the observer.
6.6.4.6	Visual impact section E: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway with the former drainage ditch and a maintenance dirt road between the roadway and perimeter berm. As indicated in Figure 6.6.4.6, trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible by the observer.
6.6.4.7	Visual impact section E: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway than illustrated in Figure 6.6.4.6. The former drainage ditch and a maintenance dirt road is located between roadway and perimeter berm. As indicated in Figure 6.6.4.7, trees with a height of at least 15 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible from a car passing the location on the adjacent roadway. There are several tall trees along the roadway, as illustrated in Figure 6.6.4.7.These existing trees would offer significant visual impact mitigation and would shield the warehouse structure from views at this location.

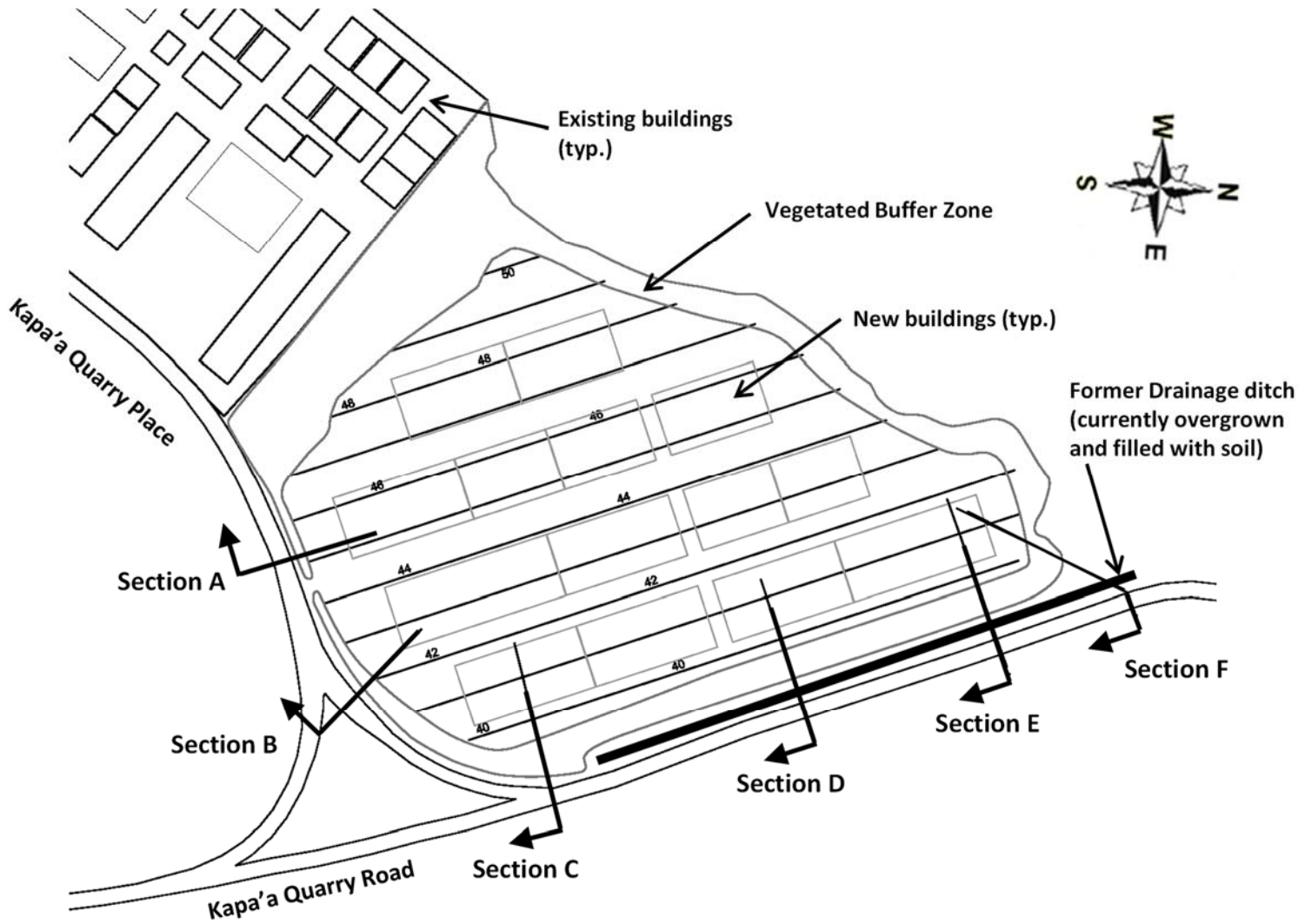


Figure 6.6.4.1: Overview of the visual impact cross sections A though F of the perimeter berms around the Lower site

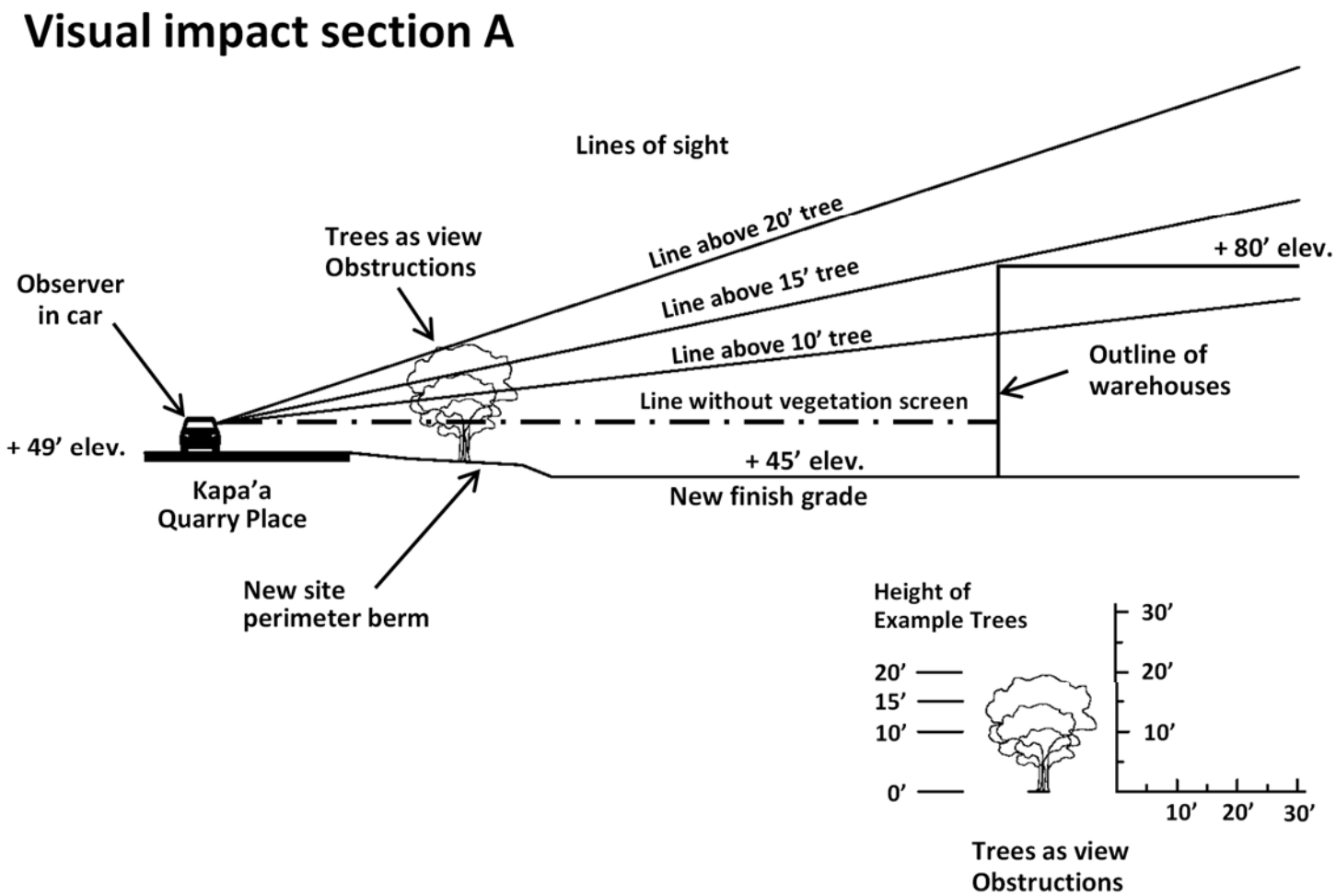


Figure 6.6.4.2: Visual impact cross section A

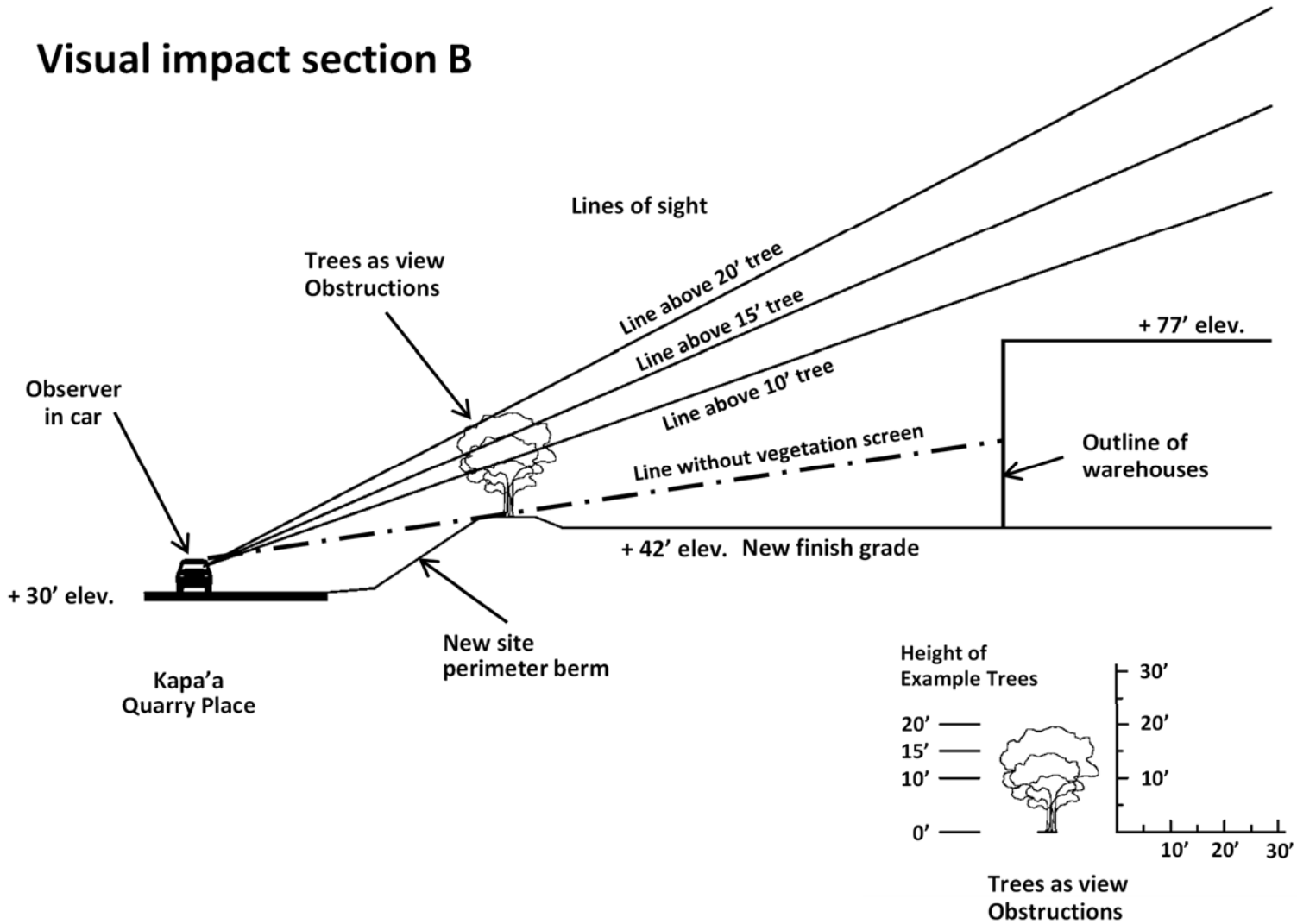


Figure 6.6.4.3: Visual impact cross section B

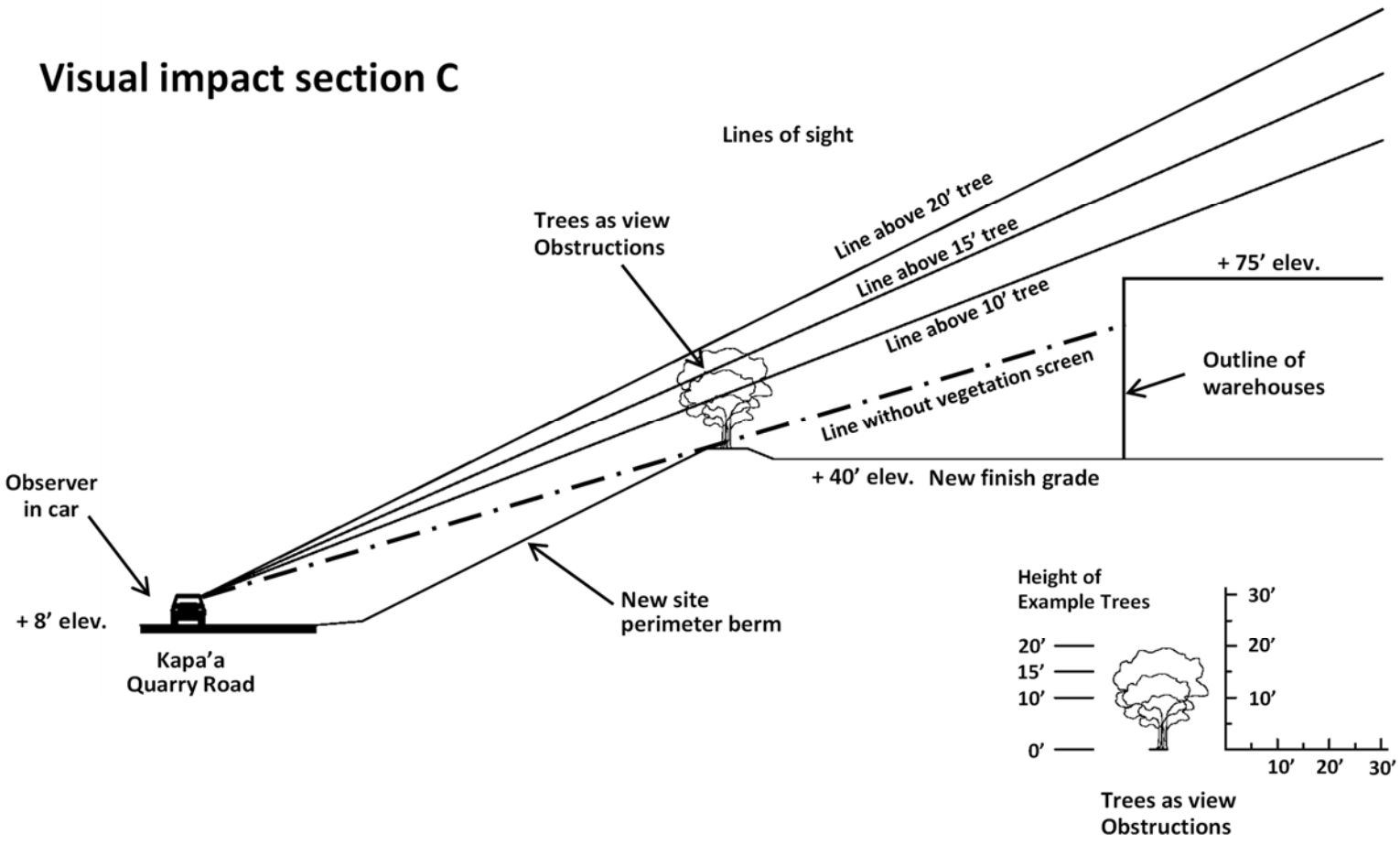


Figure 6.6.4.4: Visual impact cross section C

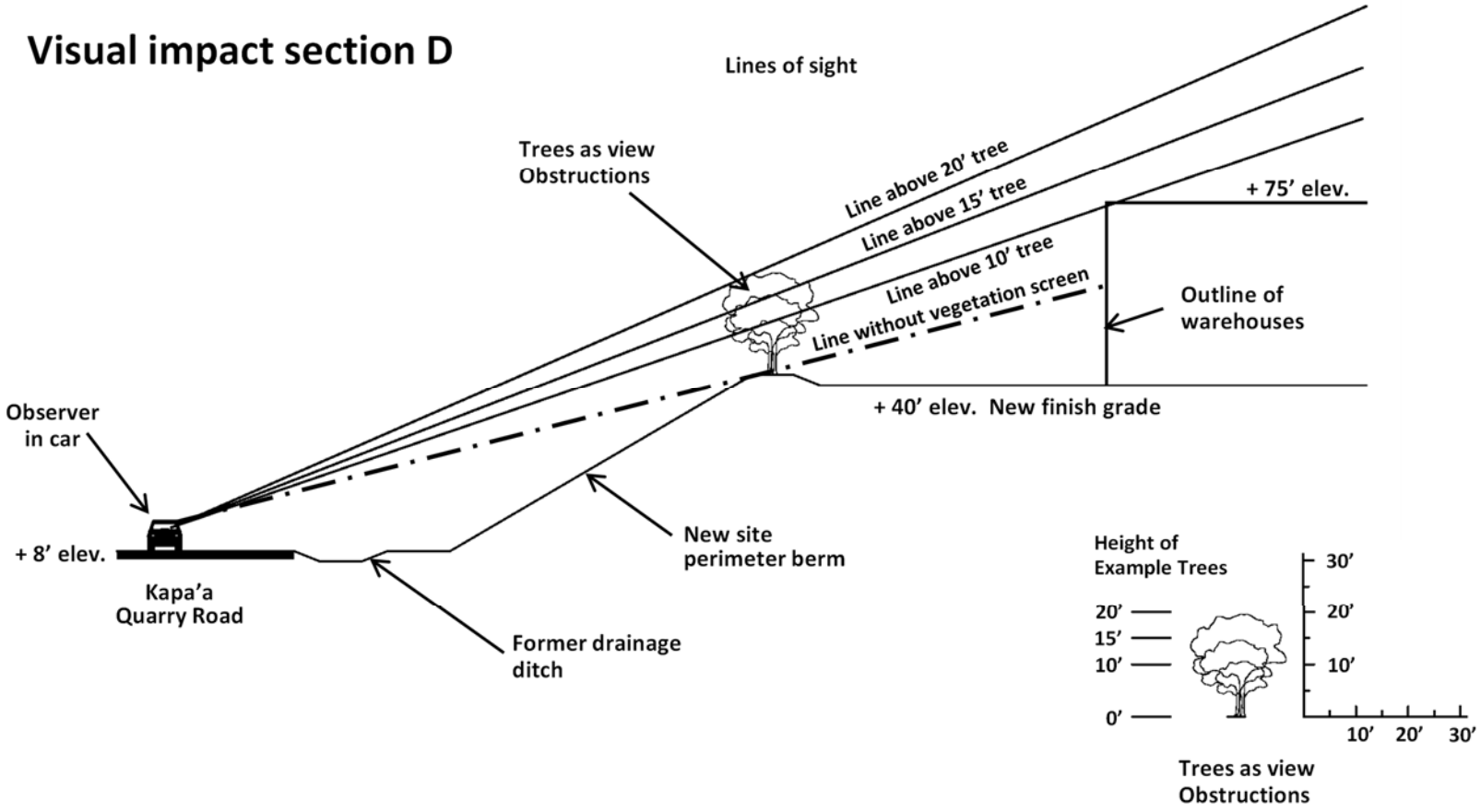


Figure 6.6.4.5: Visual impact cross section D

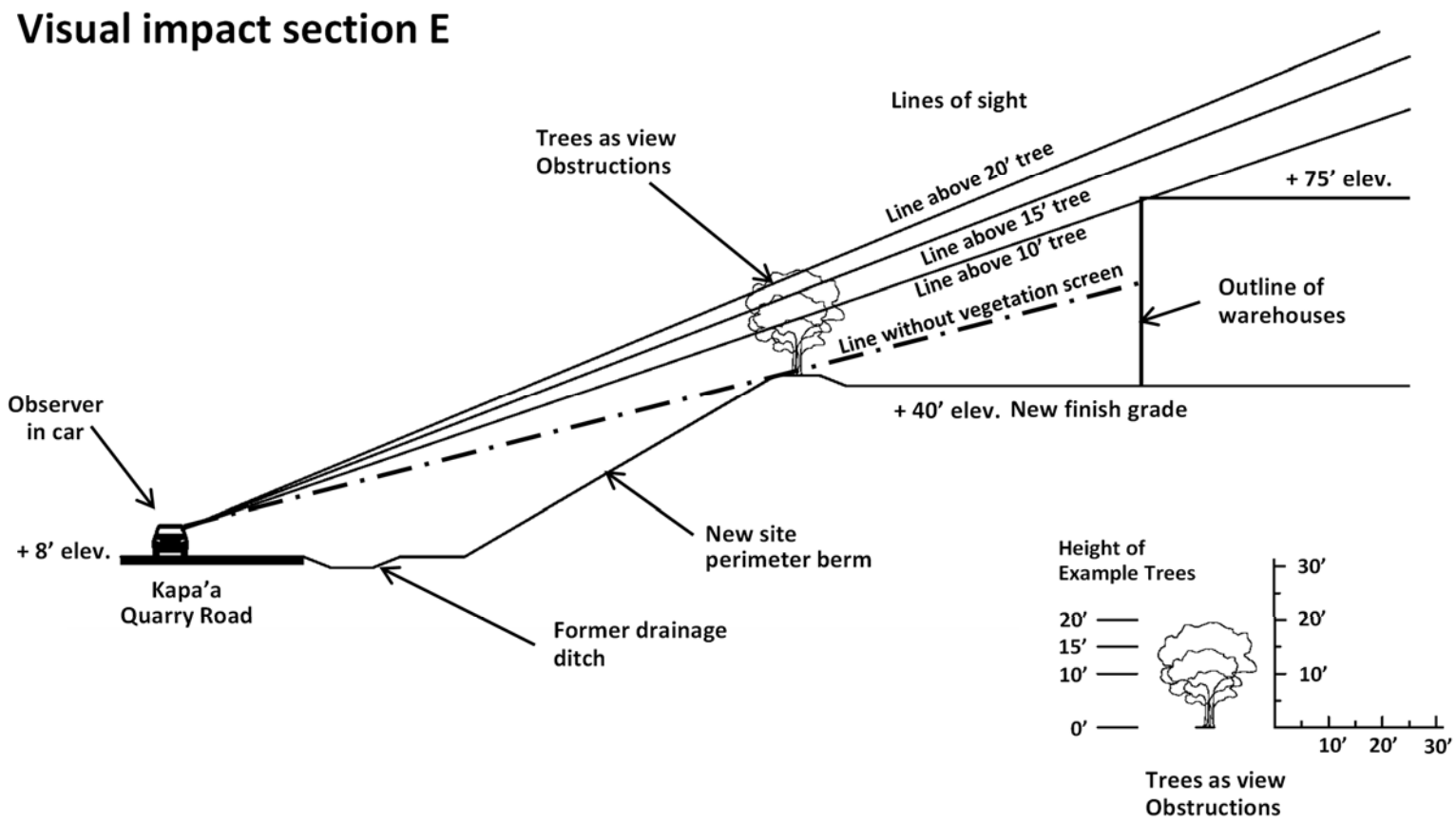


Figure 6.6.4.6: Visual impact cross section E

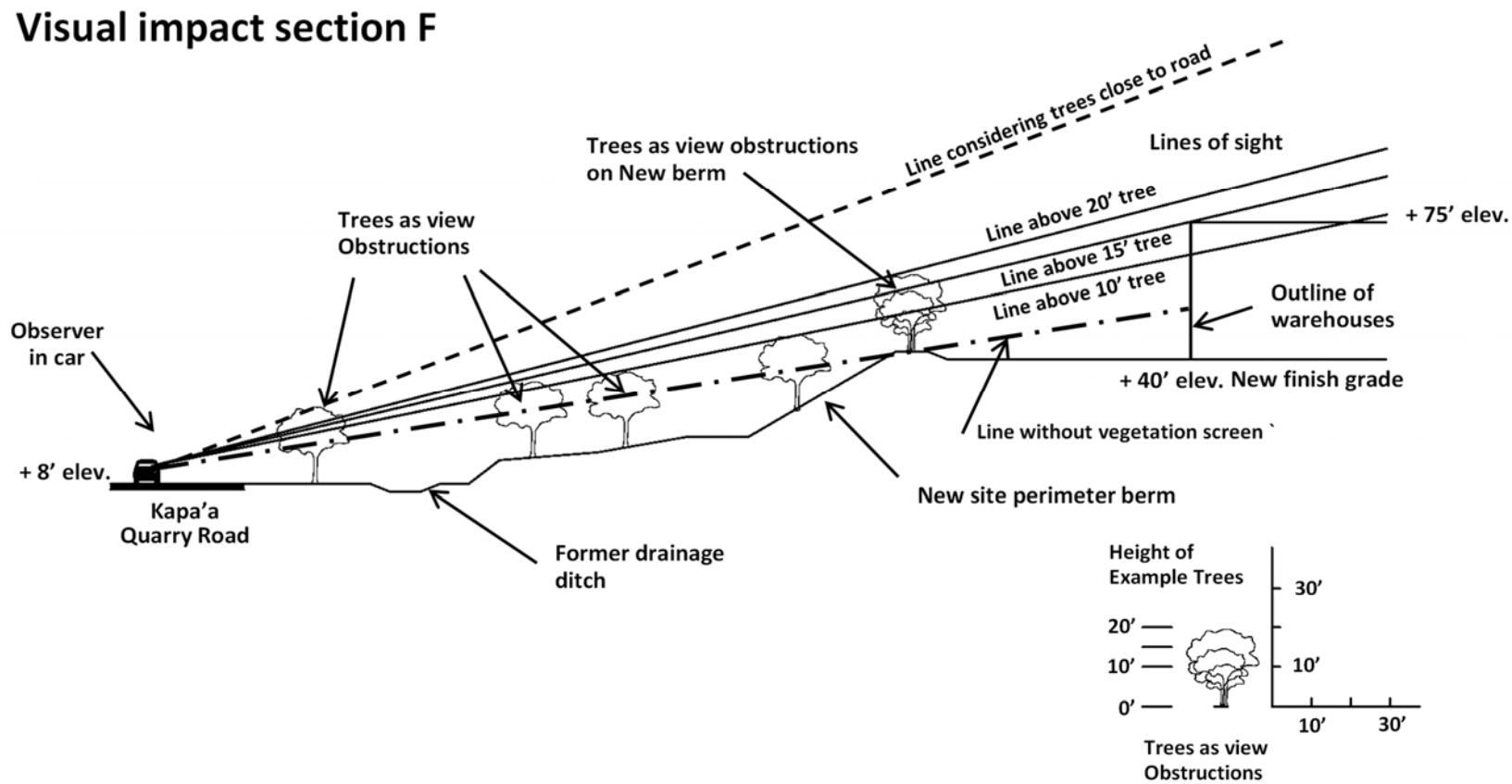


Figure 6.6.4.7: Visual impact cross section F

6.7 Vegetated Areas Inside the Project Site

This section describes the distribution of pervious to impervious areas inside the project site for the three stages in site development, (1) the 2011 FEIS, (2) the 2014 SMP and (3) the updated site development plan described under the 2021 SEIS.

6.7.1 Comparison Between the Three Stages of Site Development

Table 6.7.1.1 shows the distribution of pervious and impervious for the three site development stages. The impervious area listed in Table 6.7.1.1 includes all buildings and the sum of all pavements. The pervious area includes all vegetated area including landscaped areas within the site perimeter and the vegetated buffer zone and berms at the site perimeter. Figure 6.7.1.1 through 6.7.1.3 illustrate the locations and extents of the pervious and impervious areas for the three site development stages.

Table 6.7.1.1: Distribution of pervious and impervious for the three site development stages

		Project Site		Project Site	
No.	**Approved or presented under**	**Pervious** [acre]	**Impervious** [acre]	**Pervious** [% of total]	**Impervious** [% of total]
1	2011 FEIS	13.1	13.1	46%	54%
2	2014 SMP (2014/SMA-27)	9.7	15.3	39%	61%
3	2020 SEIS	6.4	18.6	26%	74%

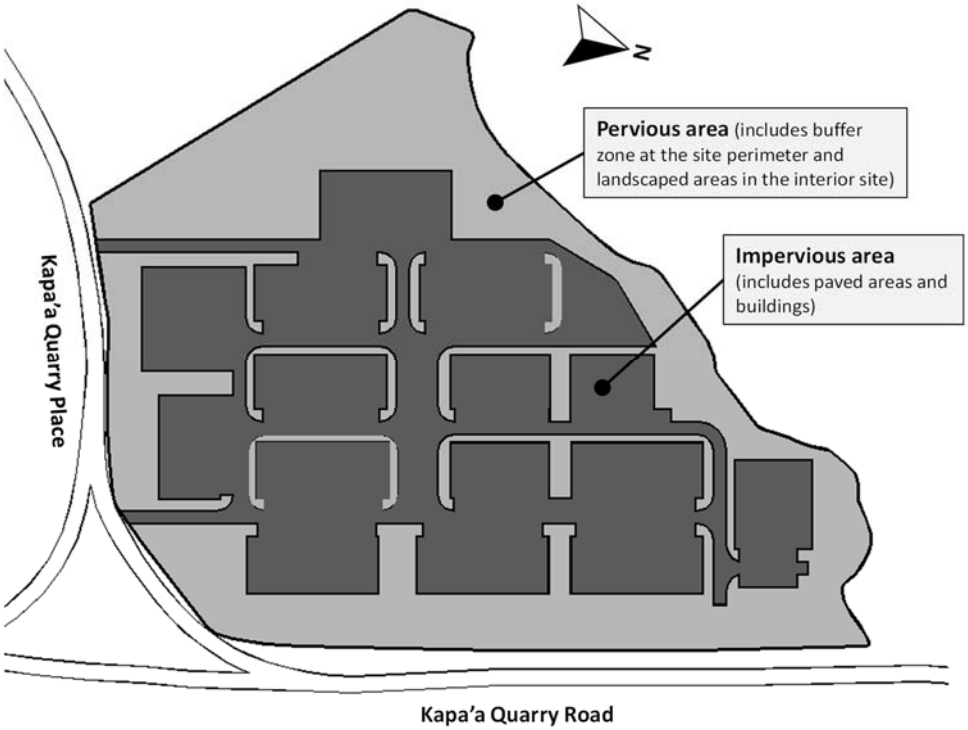


Figure 6.7.1.1: Distribution of pervious and impervious land under site Development stage of **2011 FEIS**

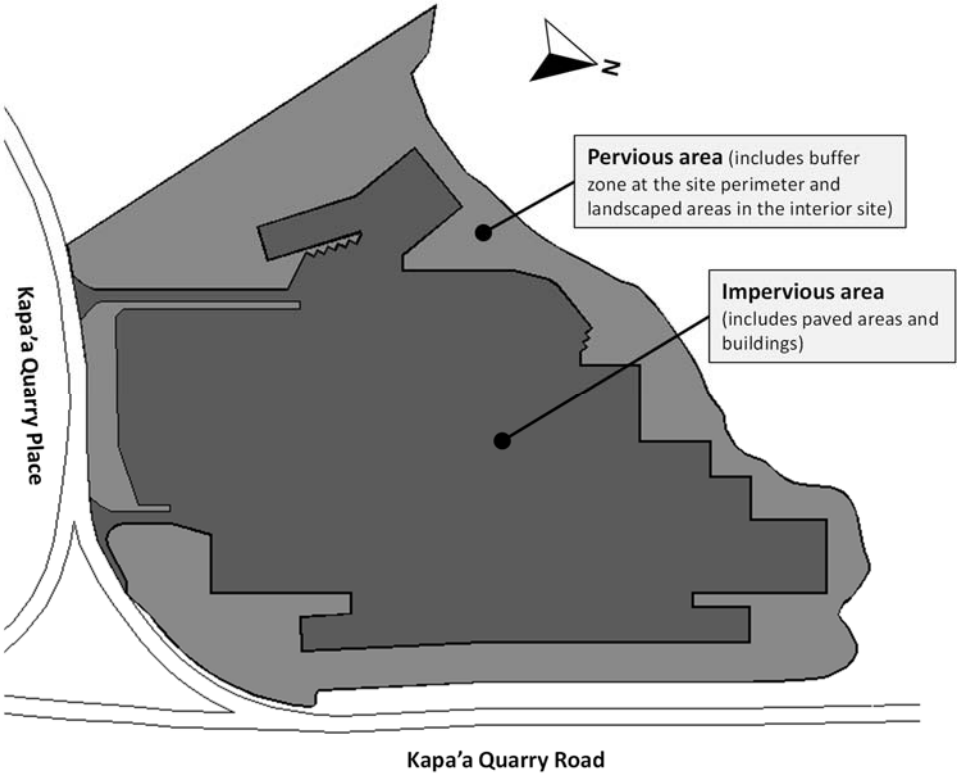


Figure 6.7.1.2: Distribution of pervious and impervious land under site development stage of **2014 SMP**

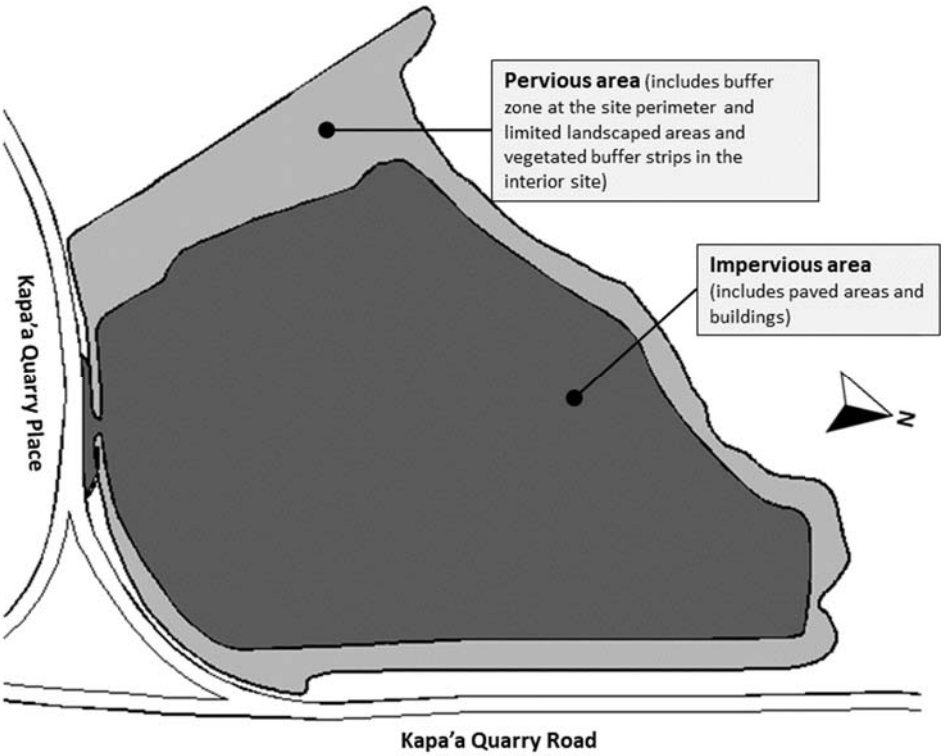


Figure 6.7.1.3: Distribution of pervious and impervious land under site development stage of **2021 SEIS**

Figure 6.7.1.4 illustrates the distribution of pervious and impervious land as percentages of the entire project site, for the three site development stages. Figure 6.7.1.4. shows that the impervious land areas increase from 2011, when the 2011 FEIS was approved through the present.

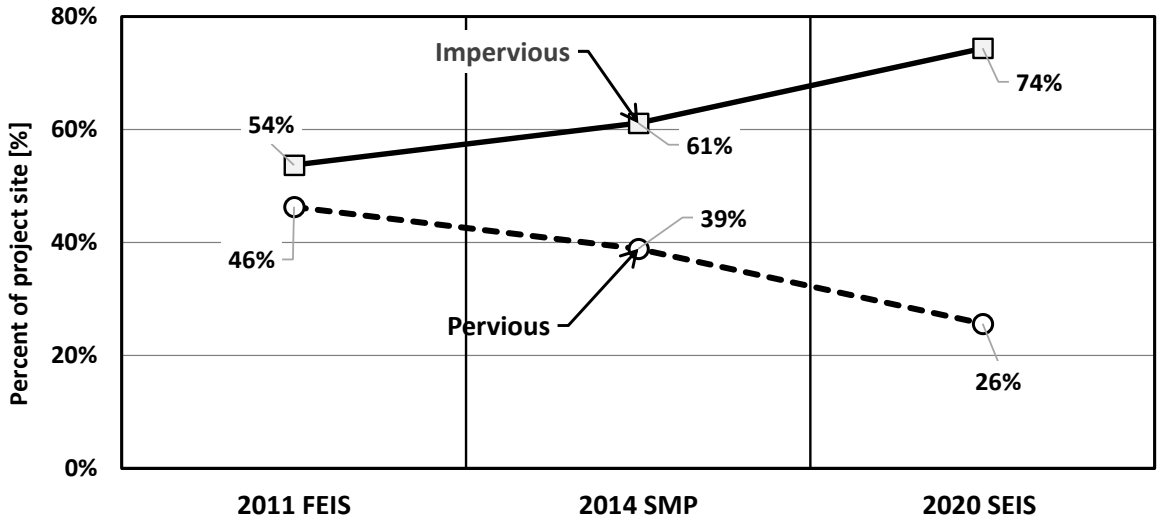


Figure 6.7.1.4: Comparison between impervious and impervious

6.7.2 Discussion about Impervious Versus Pervious Land Inside the Project Site

The conventional approach of developing a site in a sustainable way is to provide as much pervious land as possible. This approach provides for rainwater to infiltrate into the soil, which as a range of benefits. The infiltrated rainwater recharges the soil and underlying aquifers. Since less storm water runoff is created less runoff leaves the site and lower peak flow rates occur. Peak flows of runoff can create problems with streambed erosions and contribute to impacts to the aquatic resources.

The project site is, however, a former landfill, which in accordance with our research was not installed with an impermeable liner to hold back leachate from entering the groundwater. Leachate is created from infiltrated rainwater as it percolates through the landfill body and entrains potentially hazardous material. Leachate has a potentially significant adverse impact on the environment. By sealing the cover of the landfill, the amount of leachate is significantly reduced.

Therefore, since the project site is a former landfill and an impermeable seal below the landfill is missing, sealing the cover of the landfill is an essential impact mitigation strategy. In due course, establishing an impervious cover through pavement and buildings on a large portion of the project site , as being proposed, is a positive site development strategy.

<u>Implementing an impervious cover is also a condition imposed by the zone change</u> (City and County of Honolulu, Ordinance 13-35) , " … while avoiding infiltration into the existing landfill body … ", Condition 3.B of Ordinance 13-35, Stormwater Facilities. Therefore, increasing the impervious areas within the project site is a beneficial site development strategy.

6.8 Irrigation Approach Using Harvested Rainwater

This section describes the irrigation system using harvested rainwater which is part of the updated site development plan.

6.8.1 Changes from the Previously Approved Irrigation System Approach

Under the updated site development plan, irrigation areas and the process of irrigation will be changed relative to the previously accepted irrigation approach (SMP 2017/MOD-37)

The approved irrigation strategy was to collect rainwater to irrigate landscaped areas within the core areas of the site, inside the site perimeter berms. The perimeter berms, on the other hand, were not part of the irrigation plan.

Figure 6.8.1.1 shows an example of the previously approved strategy to irrigate vegetated areas within the site interior using harvested rainwater. Figure 6.8.1.1 shows area B of the previously approved irrigation system. The with the irrigated landscaped land which was located between the paved traffic area with buildings and the site perimeter berm. Rainwater was collected on a designated roof and flowed to a below ground storage tank for harvested rainwater. The harvested rainwater was then applied as irrigation water.

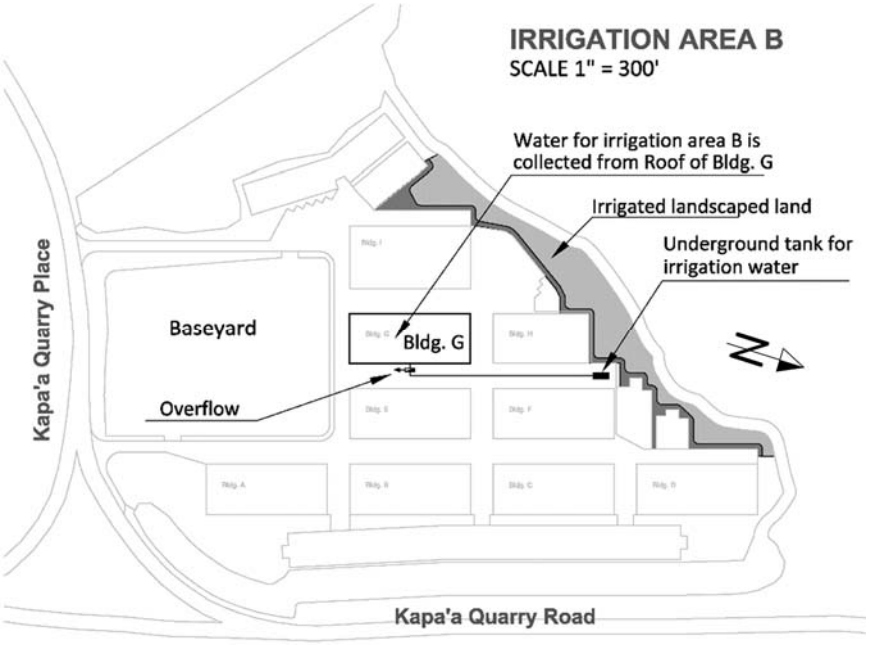


Figure 6.8.1.1: Example drawing of the previously approached irrigation approach for the site under the 2017 SP minor modification.

Source: Figure 2.4.3: Irrigation area B from the SMP Minot Modification (2017/MOD-37) Application Written Statement

Under the updated site development plan, larger landscaped areas within the site will not be used. Instead, smaller vegetated strips around buildings will be installed to provide attractive features.

Differently from the previously accepted irrigation strategies, the site perimeter berms will be irrigated to allow a dense vegetation cover made of by trees, shrubs, and ground cover. The dense vegetation will provide added protection against erosion of the berms, which is important since the berm heights and widths were increased relative to the accepted perimeter berms under the 2017 SMP minor modification permit. The dense vegetation on the perimeter berms will also provide the important functions of visual impact mitigation as well as noise and fugitive dust reduction.

Figure 6.8.1.2 illustrates the irrigation approach of the updated site development plan, using five irrigation areas at the site perimeter. Figure 6.8.1.2 shows the vegetated buffer strips.

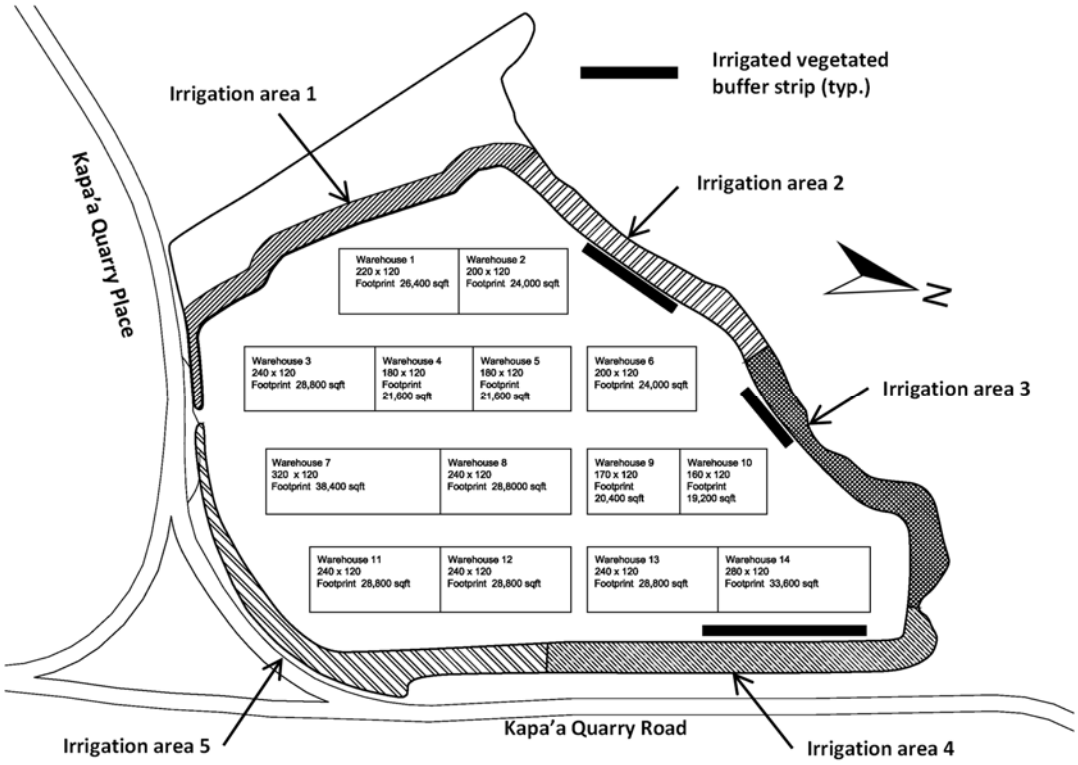


Figure 6.8.1.2: Updated irrigation approach using 5 irrigation areas at the site perimeter under the 2021 SEIS

6.8.2 Method of Calculating the Rainwater Storage Tank Sizes

The assessment of irrigation needs and therefore on the required volumes of rainwater harvesting storage tanks was done using the following assumptions:

1. Irrigation water will be applied to three types of vegetated areas, as follows:

    1.1 Portions of the vegetated berms: The type of vegetation on the site perimeter berms is a mix of larger and smaller trees, shrubs, and ground cover. The size is determined by their horizontally projected area. Limits of irrigated areas on the site perimeter berms are drawn approximately to divide the entire area of irrigated berms into five subareas 1 through 5.

1.2 Vegetated buffer strips: Turf grass is used for the three vegetated buffer strips, because of the high effectiveness of turf grass to filter our pollutants. Turf grass, however, has a relative high irrigation demand and therefore will require more irrigation water than other groundcover-plants.

1.3 Vegetated decorative strips around buildings: These vegetated strips around buildings are for aesthetics and will mostly have smaller trees and shrubs, and some groundcover for water retention.

2. Precipitation rate: The monthly rainfall rates for the site were obtained from the Rainfall Atlas of Hawaii website maintained by the Geography Department of the University of Hawaii.

3. Effective precipitation: The effective precipitation, referred to hereafter as the effective rainfall, is the portion of the precipitation that is stored in the root zone and can be used by the plants. The effective rainfall basically is the rainfall minus the deep percolation water and the runoff. Evaluating of effective rainfall involves several measures which are related to site specific soil and topography. The Food and Agriculture Organization of the UN (FAO) suggest that the effective rainfall is typically between 0.5 and 0.8. For this preliminary assessment of irrigation an average of 0.65 is used.

4. Reference Evapotranspiration Rate E_{T0} for the region: The monthly evapotranspiration rate E_{T0} for the project site were obtained from the Evapotranspiration pf Hawaii website maintained by the Geography Department of the University of Hawaii. These rates are measurements of the total amount of water needed to grow a reference plant in the given period, given in inches for this assessment.

5. Project-specific rate Evapotranspiration Rate E_{TL} : The monthly evapotranspiration rates for the irrigation areas were determined by multiplying E_{T0} by the landscape coefficient factor KL.

6. Landscape coefficient KL: The landscape coefficient K_L indicates the volume of water lost through evapotranspiration. The landscape coefficient varies with the plant species, microclimate, and planting density. The coefficient K_L is calculated by multiplying three terms:

   - The plant species factor accounts for variation in water needs of plants by different plant species.
   - The density factor accounts for the number of plants and the total leaf area of a landscape. Densely planted areas have more evapotranspiration than sparsely planted areas.
   - The microclimate factor accounts for local environmental conditions specific to the landscape, including temperature, wind, and humidity.

   For the present assessment, the three factors, plant, density, and microclimate, were obtained from tables provided by the LEED green building standard.

7. Irrigation efficiency (IT): This coefficient includes the type of irrigation system to be used. Sprinklers have a lower efficiency that drip irrigation.

The calculation of the expected irrigation needs, and the preferred sizes of harvested rainwater storage tanks included applying the assumptions 1 through 7 to the 5 irrigation areas within the Lower portion of the project site. Three different plant species were considered, trees, shrubs, and ground cover, which had different landscape factors. The net irrigation needs were expressed in inches and were applied to the irrigation area. The results were the monthly distribution of irrigation needs for the irrigation areas in cubic feet. As the final step to select the sizes of the storage tanks for rainwater harvesting percentages were applied to the maximum monthly value. These values expressed the portion of the irrigation needs that would be served by the harvested rainwater. For example, if the maximum monthly irrigation need were 1,000 cubic feet (cbft) and the percentage of irrigation provided was selected as 50%, the resulting size to the storage tank would be 500 cbft.

6.8.3 Layout of Five Irrigation Area

Figures 6.8.3.1 through 6.8.3.5 illustrate the location and extend of the five irrigation areas. Figure A through E furthermore indicate which building roof was harvesting rainwater for irrigation and where the approximate location of the underground rainwater storage tank would be.

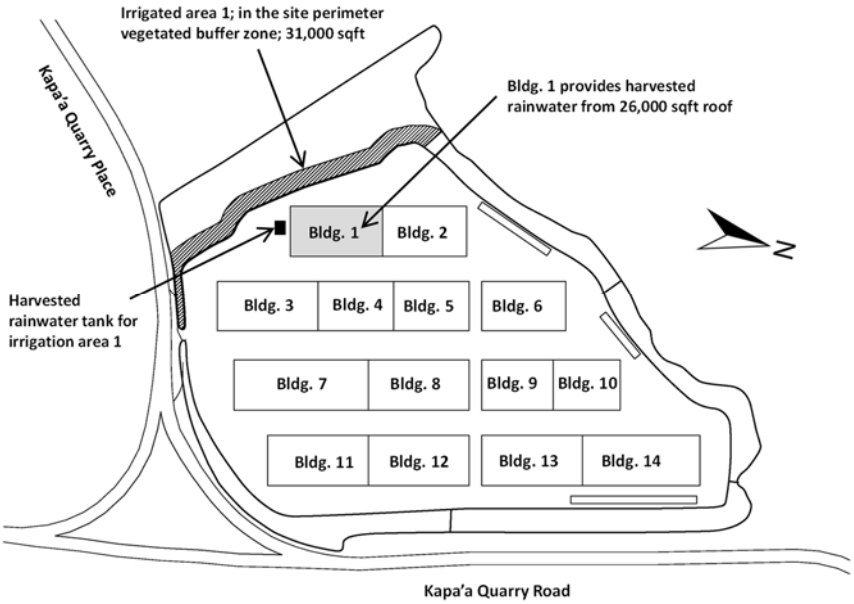


Figure 6.8.3.1: Location and extend of irrigation area 1

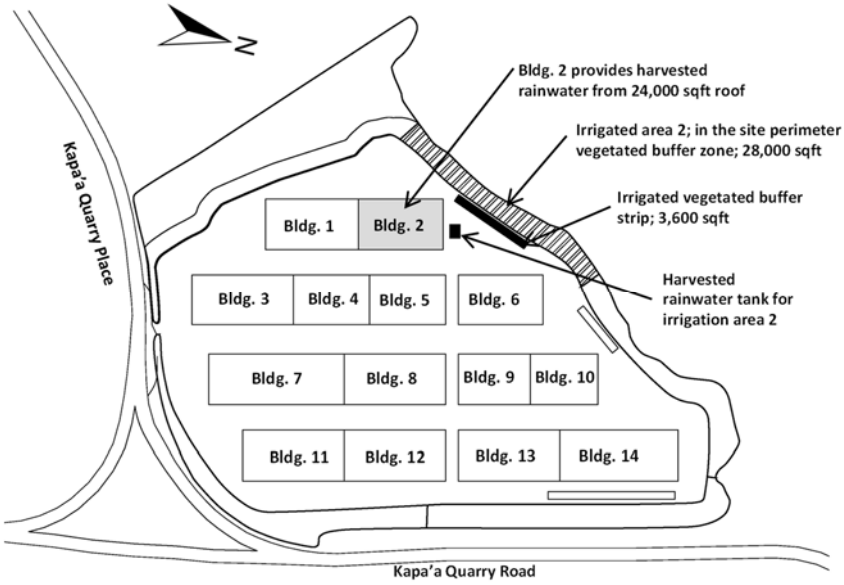


Figure 6.8.3.2: Location and extend of irrigation area 2

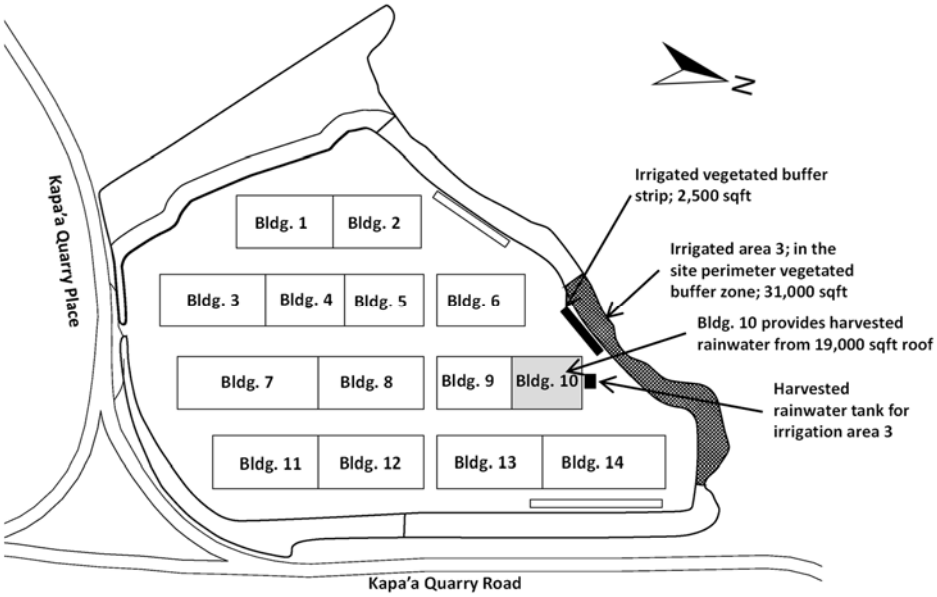


Figure 6.8.3.3: Location and extend of irrigation area 3

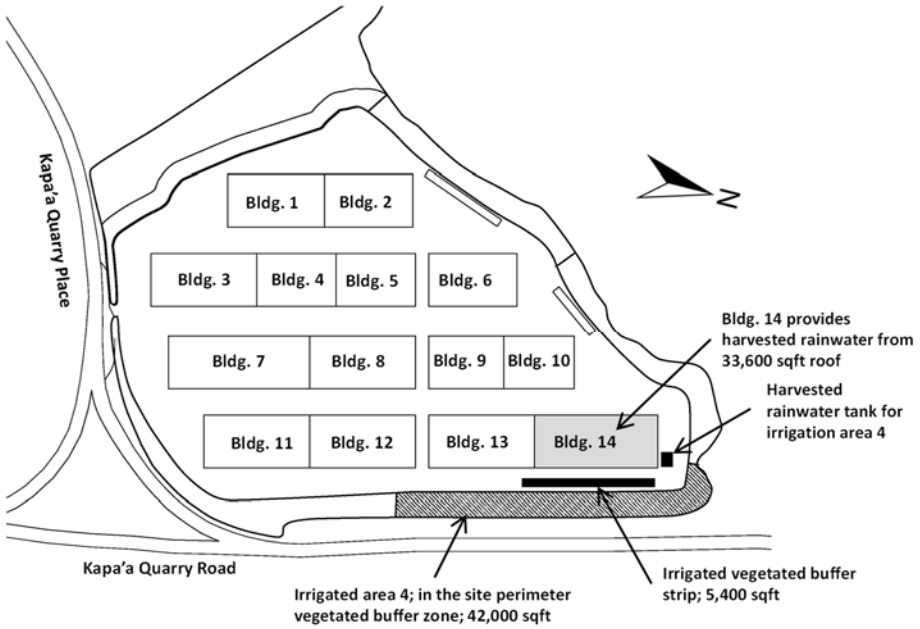


Figure 6.8.3.4: Location and extend of irrigation area 4

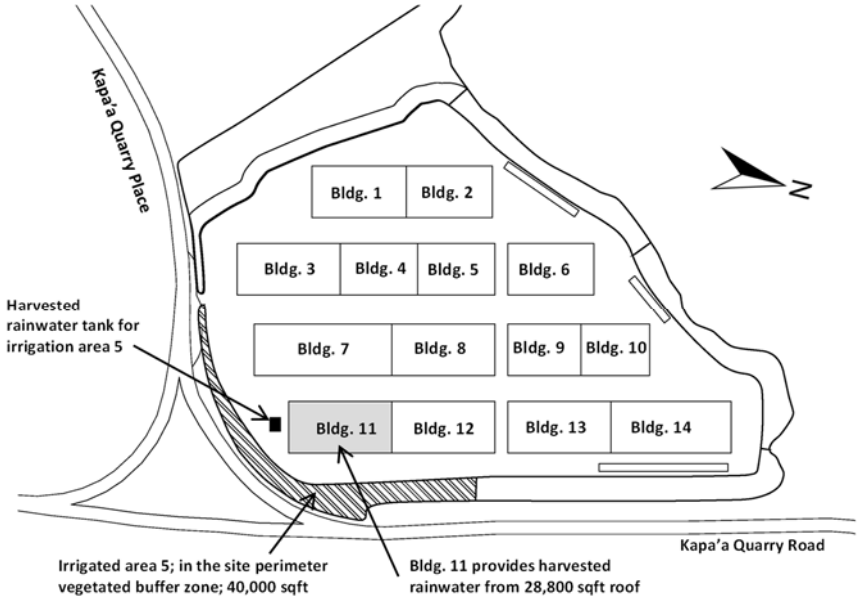


Figure 6.8.3.5: Location and extend of irrigation area 5

6.8.4 Results of the Irrigation calculations

Table 6.8.4.1 shows the results of the irrigation calculations.

Table 6.8.4.1: Results of the irrigation calculations

Irrigation areas	Areas to irrigate				Bldg. to collect rainwater		selected storage volume Note (1)
	Perimeter berm	effective are at perimeter	Vegetated Buffer strip	Plants around bldgs			
No.	sqft		sqft	sqft	Bldg. No.	Roof sqft.	cbf
Area 1	31,000	70%	0	1,400	1	26,000	1,300
Area 2	28,000	70%	3,600	2,400	2	24,000	2,200
Area 3	31,000	70%	2,500	1,700	10	19,200	2,000
Area 4	42,000	80%	5,400	1,400	14	33,600	3,300
Area 5	40,000	80%	0	1,900	11	28,800	2,000
							10,800

Note (1): Selected storage volume considers net irrigation needs for the subareas:

Type of irrigation area:	Percentage of irrigation needs served by the storage tank
Perimeter buffer	**50%**
Vegetated buffer strip	**70%**
Irrigated strip at bldgs.	**70%**

The selected storage volumes for harvested rainwater for the five irrigation areas consider different percentages of the net irrigation needs that will be provided, on average, for the respective irrigation areas. For the perimeter buffer berms, the percentage value is lower than for the vegetated buffer strips and the irrigated vegetated strips along the buildings. With smaller percentage values, the storage tanks for the harvested rainwater will be smaller since the probability that not all irrigation needs can be satisfied with harvested rainwater increases and likewise more potable water might be needed to substitute for harvested rainwater.

The irrigation needs would be reduced when native or adapted plants are used for the vegetated buffer zone on the perimeter berms. The quantitative effects of using native or adapted plants for the perimeter berms have not been included in the irrigation calculation, since the calculations used generic assumptions. But it can be expected that irrigation needs would be lower by using native or adapted plants. Figure 6.8.4.1 shows an example of the monthly distribution of net irrigation needs and the capacity of collecting rainwater to be stored. Figure 6.8.4.1 shows the example of irrigation area 4, which has the highest irrigation demand and the largest selected storage tank for the harvested rainwater. The size of the selected tank is 3,300 cbft, which is the aggregate volume for the three types of irrigated areas for the month of June, which has the maximum mean net irrigation needs of the design year.

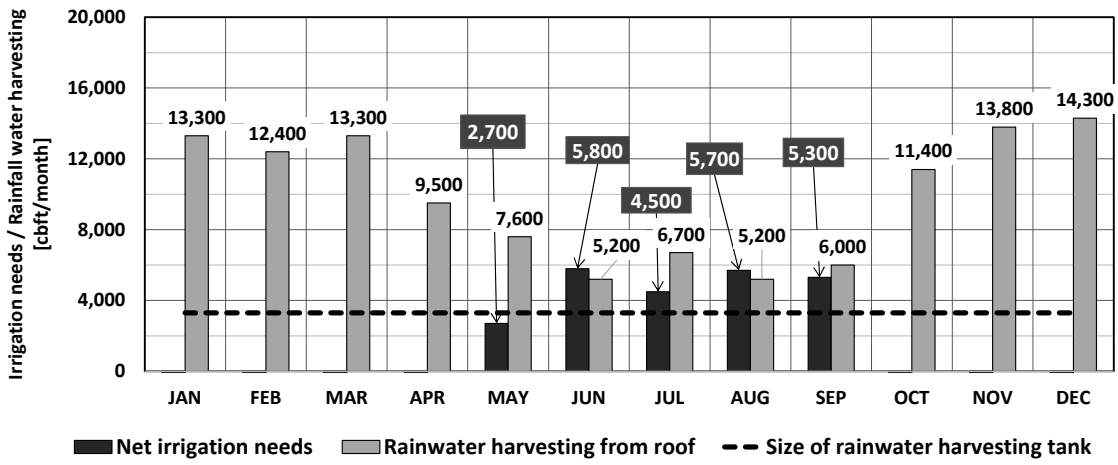


Figure 6.8.4.1: Monthly distribution of net irrigation needs and the capacity of collecting rainwater to be stored

6.8.5 Irrigation System

The preliminary design of the irrigation system is shown in Figure 6.8.5.1. Rainwater from the rooftop will be conveyed to the below-ground rainwater storage tank. If the tank is filled to capacity the tank overflows and the overflowing water is discharged to the site storm water collection system.

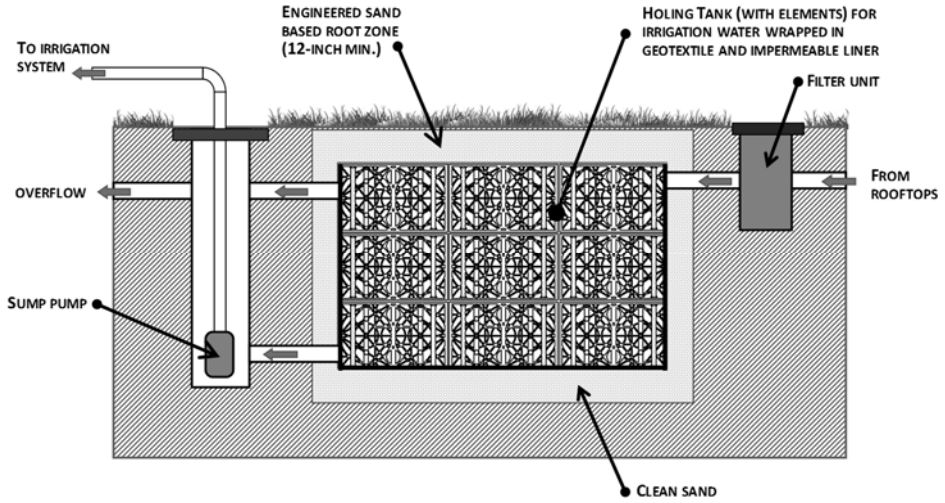


Figure 6.8.5.1: Below-ground rainwater storage tank with external irrigation pump

(source Figure 2.3.1 of the 2017/MOD-37 SMP minor modification report)

6.8.6 Comparison to Previous Irrigation Design Concepts

Table 6.8.6.1 shows a comparison of different irrigation system which have been proposed for the Lower portion of the Kapa'a Light Industrial Park. Table 6.8.6.1 indicates previous reports and concept designs

for the irrigation system for the Lower portion of the project site and the proposed total storage volume for the harvested rainwater.

Table 6.8.6.1: Comparison of different irrigation system for the Lower site

No.	Report title – or description of concept designs for irrigation system	Proposed total storage volume for Lower site
1	2011 FEIS – Final Environmental Impact Statement	Not specified – Irrigation storage was not quantified
2	2014 Written Statement and Project Description for SMP application; application was approved as 2014/SMA-27 permit	17,000 cbft
3	2017 Written Statement and Project Description for second SMP Minor Modification application; application was approved as 2017/MOD-37 permit	10,000 cbft
4	2021 This Supplemental EIS – The updated site development plan presented in this SEIS	10,800 cbft

6.9 Changes of the Roadway access to the Lower project site

This section describes the proposed modifications of the roadway access to the project site. The main difference between the approved roadway access configuration and the roadway access under the updated site development plan is the change from two road entrances to one entrance.

6.9.1 Description of the Previously Approved Roadway Access

The accepted roadway access design was developed to respond to one condition of the zone change ordinance. This requirement required the Applicants to work with the City & County Traffic Department on an agreement about road frontage improvements. For the Lower portion of the site this agreement included the construction of two roadway entrances. The agreement further requires the owner to construct an 8-foot sidewalk along the frontage of the site.

Figure 6.9.1.1 shows the proposed road access to for the Lower portion of the Kapa'a Light Industrial Park. Figure 6.9.1.1 illustrates the location and configuration of the two previously approved roadway entrances and intersections at the Southern site perimeter of the Lower site. The traffic agreement called for dedicated left turns into the Lower site for the East-bound traffic on the Kapa'a Quarry Place. The approved post-construction roadway accesses were planned at approximately the same locations as the two presently unpaved roadway accesses to the Lower site. The Figure shows the roadway accesses designs No. 1 and 2 which are superimposed on a background image of the existing Kapa'a Quarry Road and portions of the Lower site.

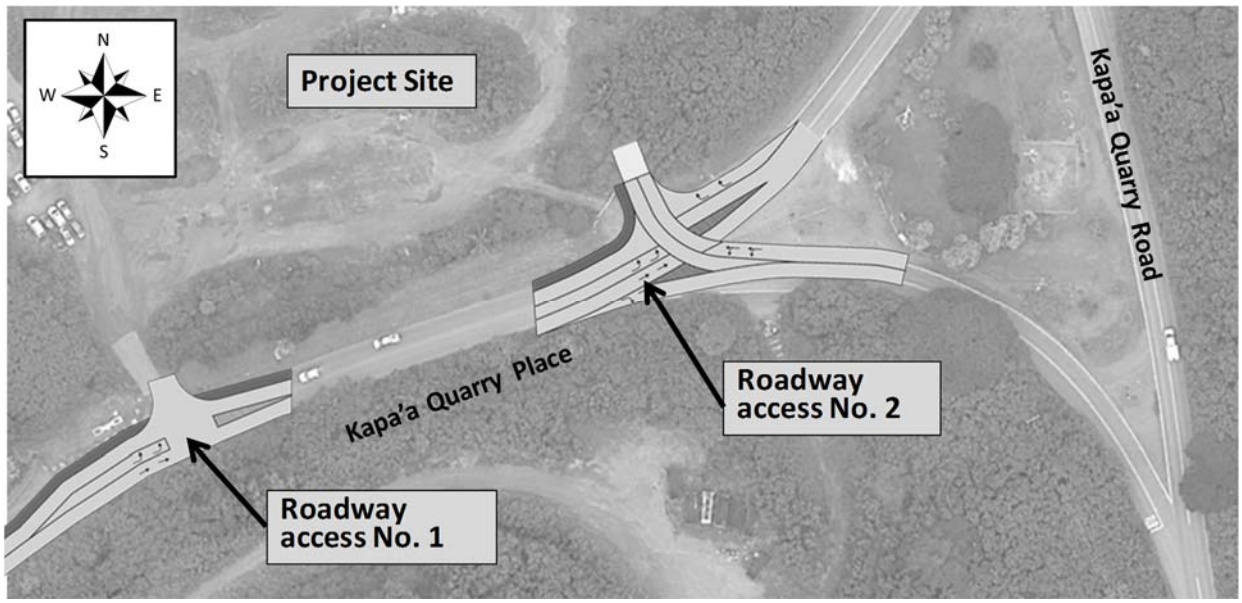


Figure 6.9.1.1: Two previously approved post-construction roadway accesses to the site (source Figure 9.2.1 of SMP the Minor Modification written statement 2017/MOD-37)

Under the approved plans the two road entrances and intersections were planned as follows:

Roadway access No. 1 was planned as a simple T-intersection. The intersection had a dedicated left turn lane for the East-bound traffic. The dedicated left turn avoided traffic interference for East-bound traffic on Kapa'a Quarry Place entering the site. The West-bound and the East-bound traffic had through-lanes.

Roadway access No. 2 was planned as a four-leg irregular cross intersection. The intersection had a dedicated left turn lane for the East-bound traffic on Kapa'a Quarry Place. The dedicated left turn avoids traffic interference for East-bound traffic entering the site. The West-bound and the East-bound traffic have through-lanes. The West-bound traffic had a deceleration lane. The North-West bound traffic had a combined through- and left-turn lane. The South-East bound traffic leaving the site had a dedicated through lane.

Figure 6.9.1.3 through 6.9.1.5 show three views of the existing traffic pattern adjacent to the existing unpaved and unimproved road entrance that is nearest to the Kapa'a Quarry Road. The existing road access is located near the Y-intersection that joins the two Lower portions of the Kapa'a Quarry Place roadway. Figure 6.9.1.2 shows the locations of the depicted views A through C.

Under the approved roadway design, access was planned to use the location of the existing road access for the post-construction road access. The visual inspection of the views A through C illustrates that the

traffic situation at the planned road access to the site has sight distance challenges and a complex traffic pattern. These traffic concerns have prompted the redesign of the roadway access to the site.

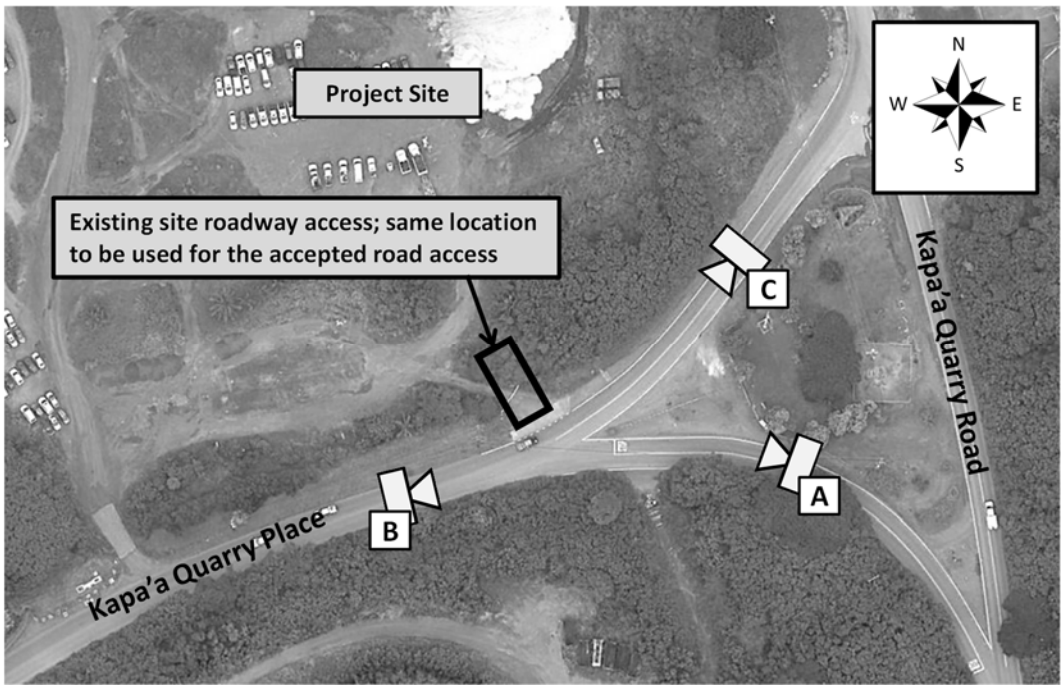


Figure 6.9.1.2: Locations of the view planes A through C at the existing unimproved roadway access

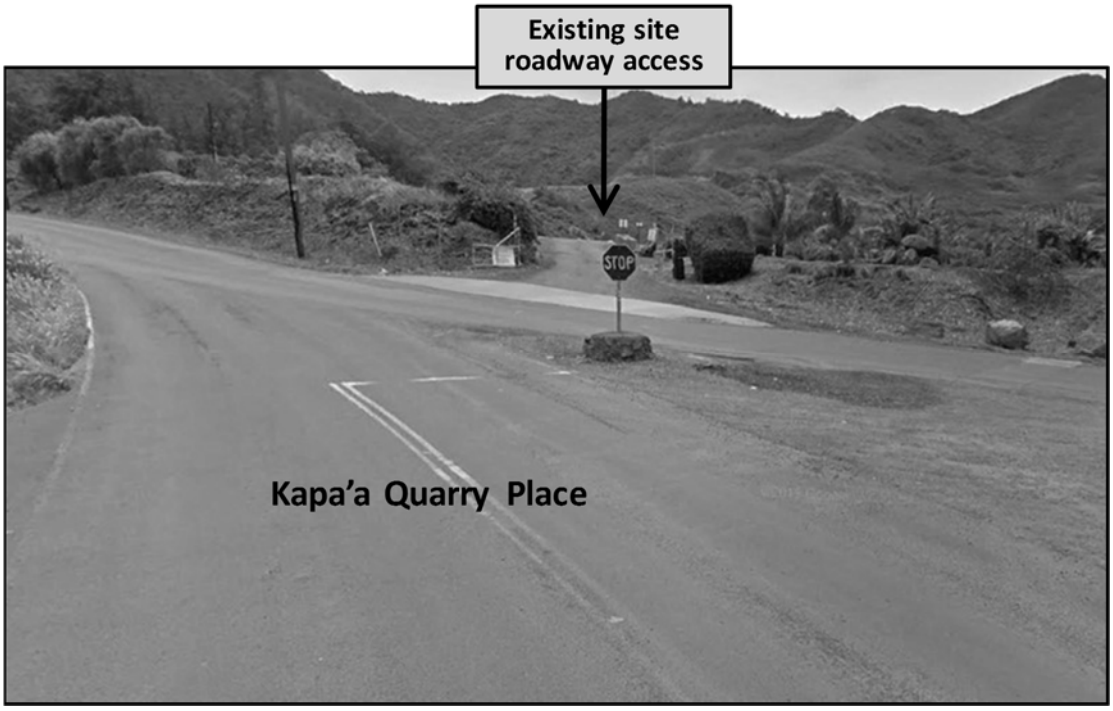


Figure 6.9.1.3: **View plane A**: traffic direction is **North-West** bound

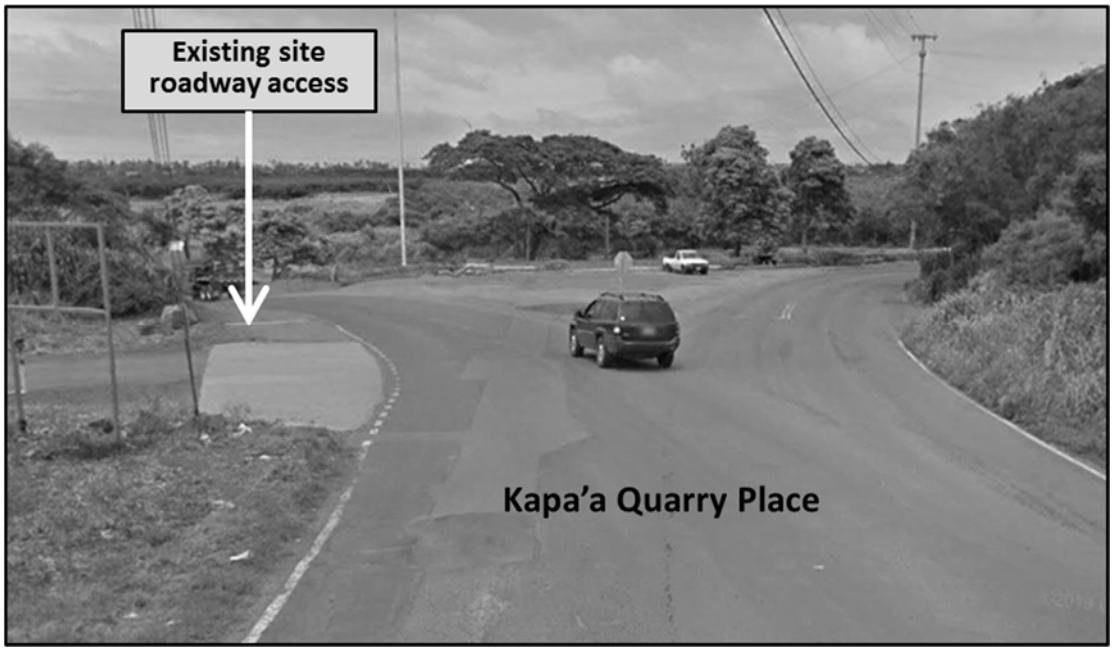


Figure 6.9.1.4: **View plane B**: traffic direction is **East** bound

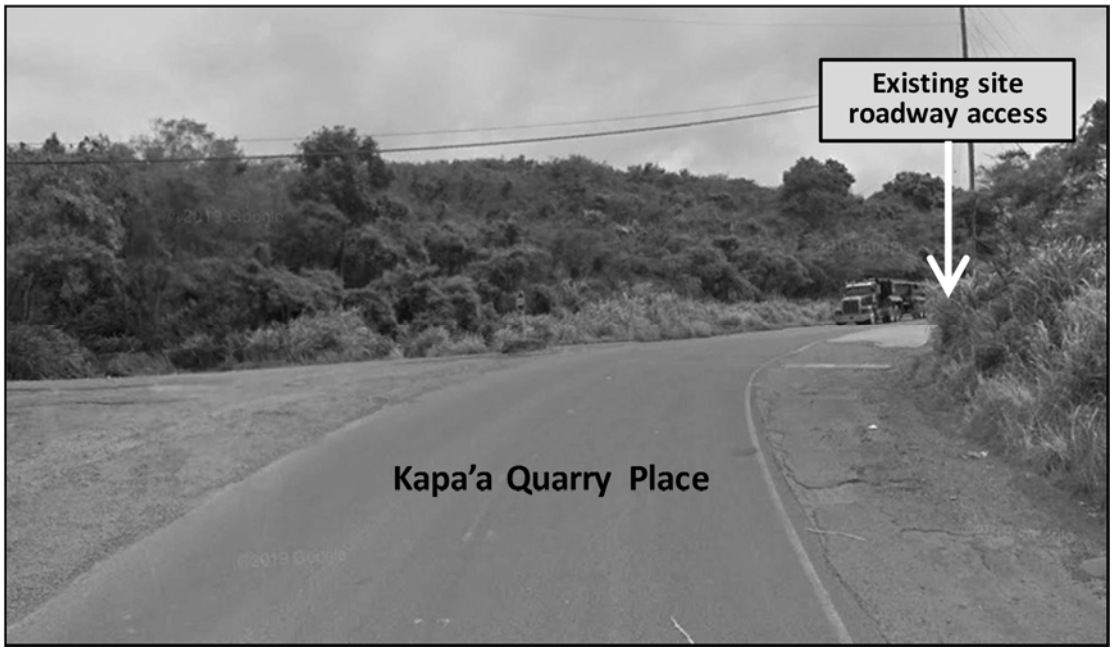


Figure 6.9.1.5: **View plane C**: traffic direction is **South-West** bound

6.9.2 Proposed Modified Roadway Access to the Lower Site

The proposed roadway access under the updated site development plan would be a single road entrance to the Lower site. The single roadway entrance would be located some 450 feet uphill and to the West from the approved roadway access No. 2. (refer to Figure 6.9.1.1). Figures 6.9.2.1 and 6.9.2.2 illustrate the location of the proposed roadway access. Figure 6.9.2.3 shows a detail of the proposed roadway access to the site.

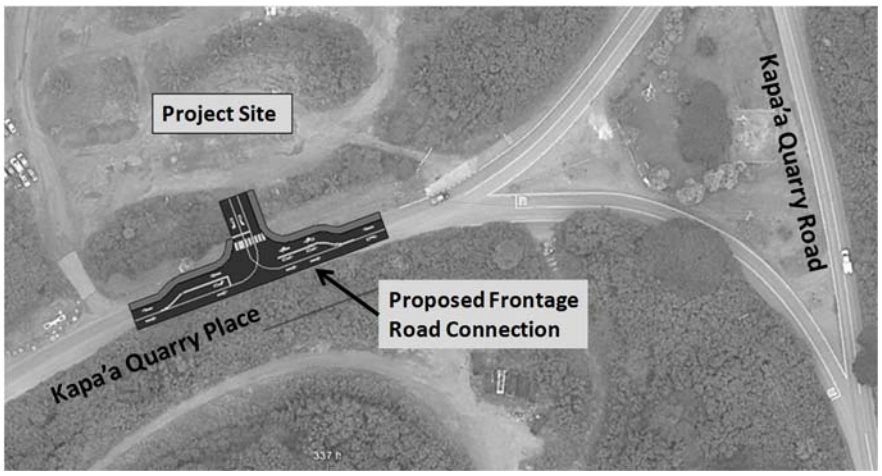


Figure 6.9.2.1: Location of the modified roadway access under the updated site development plan

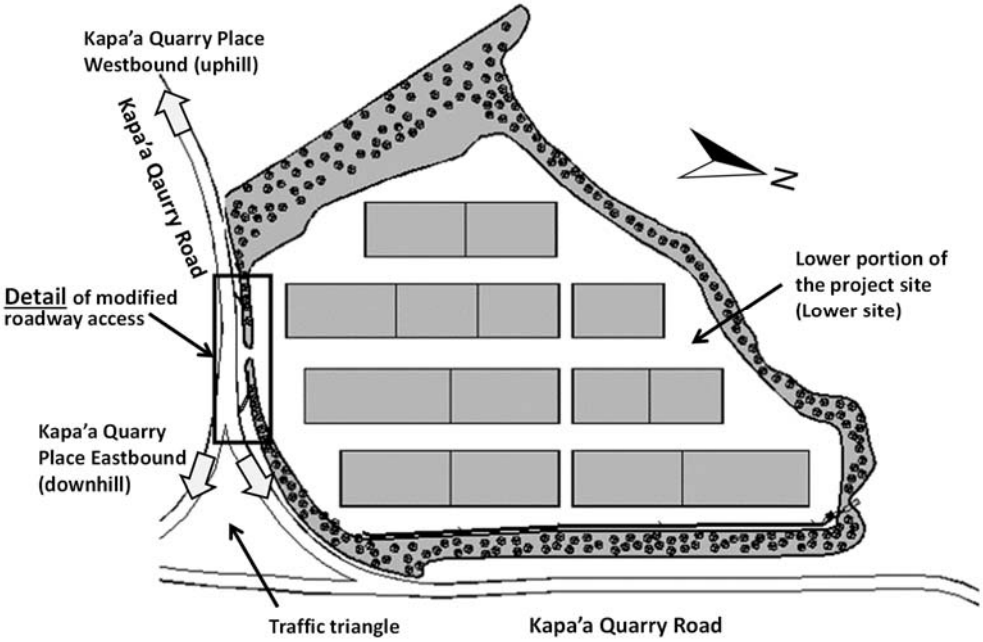


Figure 6.9.2.2: Location of the modified roadway access under the updated site development plan

Figure 6.9.2.3 shows the proposed configuration of the new intersection and roadway access to the Lower site with more of the surrounding area. Figure 6.9.2.3 indicates the location of the existing unpaved and unimproved roadway accesses to the Lower site.

In initial review, the Traffic Review Branch (TRB) accepted the concept of the single roadway access to the Lower site to substitute for the previous two roadway accesses. The final configuration of the intersection will be determined by the results of the Traffic Impact Analysis Report (TIAR) and ongoing communication with the TRB and the State Department of Transportation.

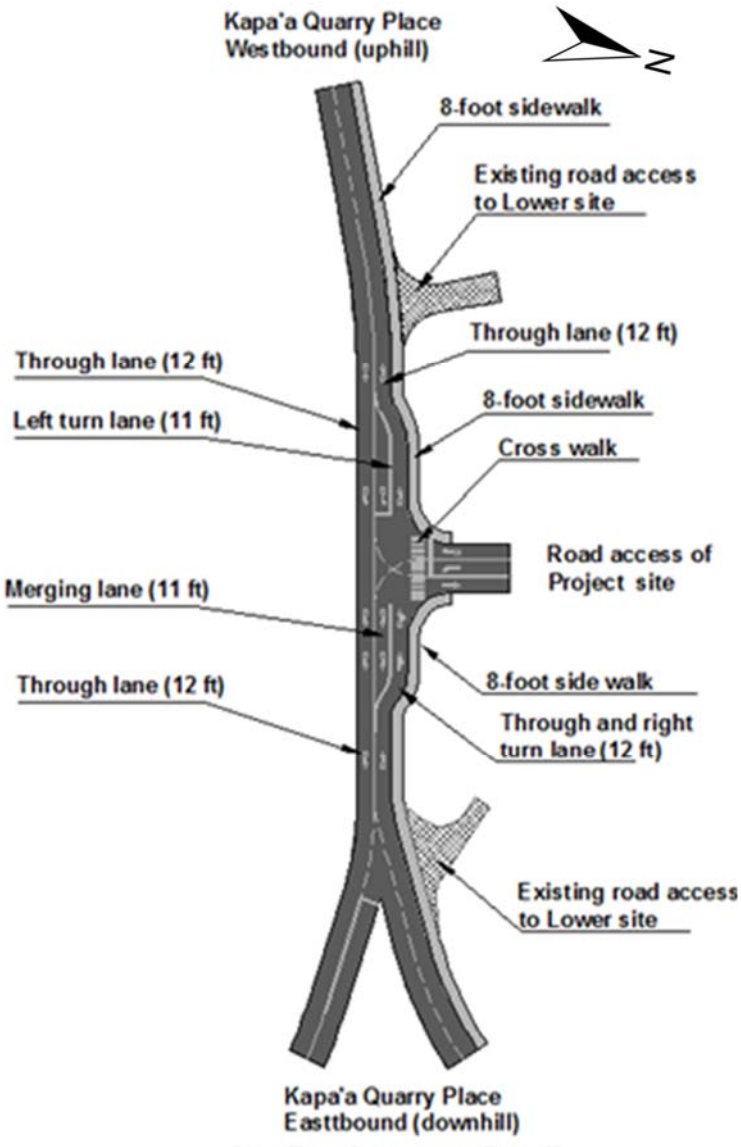


Figure 6.9.2.3: Detail of the **proposed** roadway access to the project site under the updated site development plan

Eastbound traffic has a dedicated left-turn lane and a through lane.

Westbound traffic has a combined right-turn and a through lane.

Traffic leaving the project site making a left turn has a dedicated left-turn lane and an acceleration lane to merge with the through lane for the East-bound traffic.

An **8-foot-wide sidewalk is shown,** which will be installed along the roadway is a requirement of DPP.

Upon initial review by TRB the configuration of the single roadway entrance configuration , depicted in Figure 6.9.2.3 will have to be adjusted to conform with the findings of the New TIAR.

Figure 6.9.2.4 illustrates the existing and planned traffic regulations on the Kapa'a Quarry Place, which are conveyed by existing and planned signs traffic. A 25-mph speed limit is in effect, which is posted by several traffic signs. An existing stop sign signals the merging eastbound traffic from the South on the Lower reaches of the Kapa'a Quarry place to yield to traffic on the Northern leg of the Kapa'a Quarry Place.

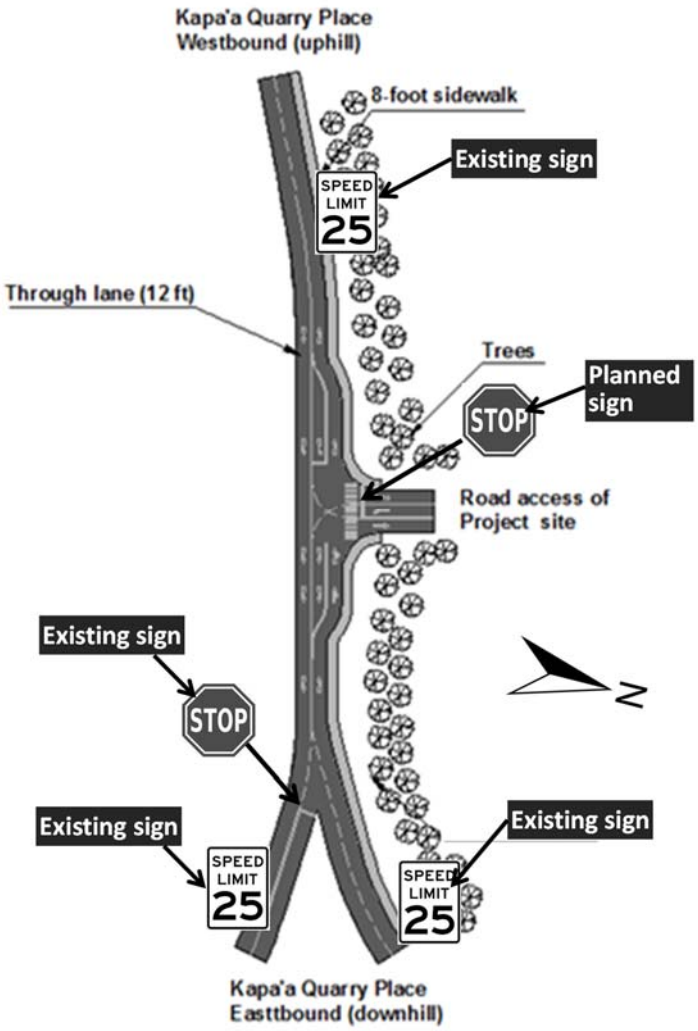


Figure 6.9.2.4: Existing and planned traffic regulation of the modified roadway access

Figure 6.9.2.4 illustrates the approximate locations of the existing and planned traffic signs.

The figure shows the approximate location of trees planted at the Southern of the Lower site perimeter for visual impact mitigation. While the trees are effective to block views of the warehouses inside the site, trees can be obstacles for traffic relevant views.

Therefore, the trees will be planted outside the clear sight triangles of the sight distance assessments.

Sight distance assessment for intersection with stop sign control.

Figures 6.9.2.5 and 6.9.2.6 show the sight distance assessments for the modified roadway access to the Lower site. The sight distance assessment was done for the traffic leaving the site. The vehicles leaving the site stop at the stop sign posted and must have sufficient sight distance to permit safe departure. For this assessment, the vehicles either make a left or a right turn maneuver.

The right turn maneuver requires first clearing the traffic coming from the vehicle's left and then entering the traffic coming from the vehicle's right. The required sight distance for this left turn is determined by the amount of time it takes the stopped vehicle making the left turn while clearing the traffic and reaching average running speed, without affecting the speed of the approaching vehicle. The right turn maneuver must have sufficient sight distance to permit safe entrance onto the intersecting roadway and then accelerate to the posted speed limit.

The assessment confirms that:

- For the left turn maneuver, the available sight distance is larger than the recommended sight distance of 280 feet for the speed limit of 25 mph. Therefore, the left turn sight distance is adequate. (Figure 6.9.2.5)
- For the right turn maneuver, the available sight distance is larger than the recommended sight distance of 240 feet for the speed limit of 25 mph. Therefore, the right turn sight distance is adequate. (Figure 6.9.2.6).

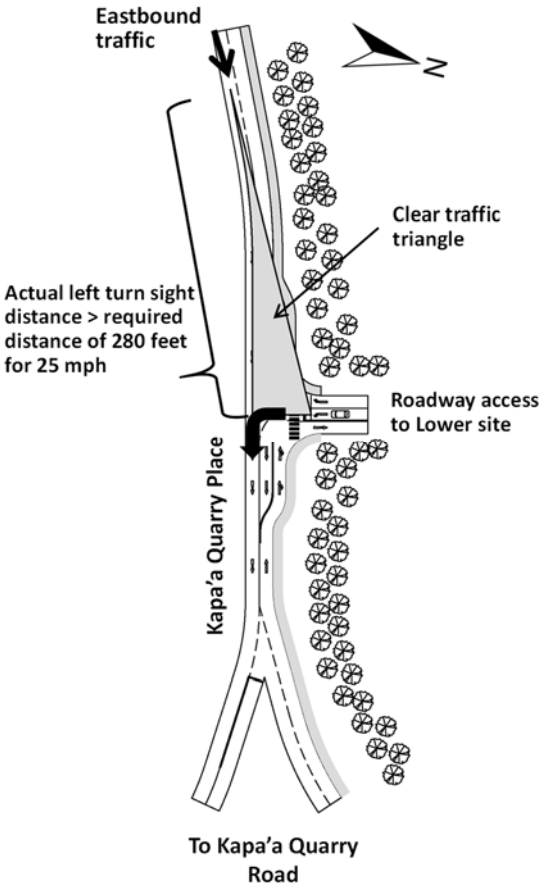


Figure 6.9.2.5: Sight distance assessment for **left turn** maneuver with Stop Sign Control

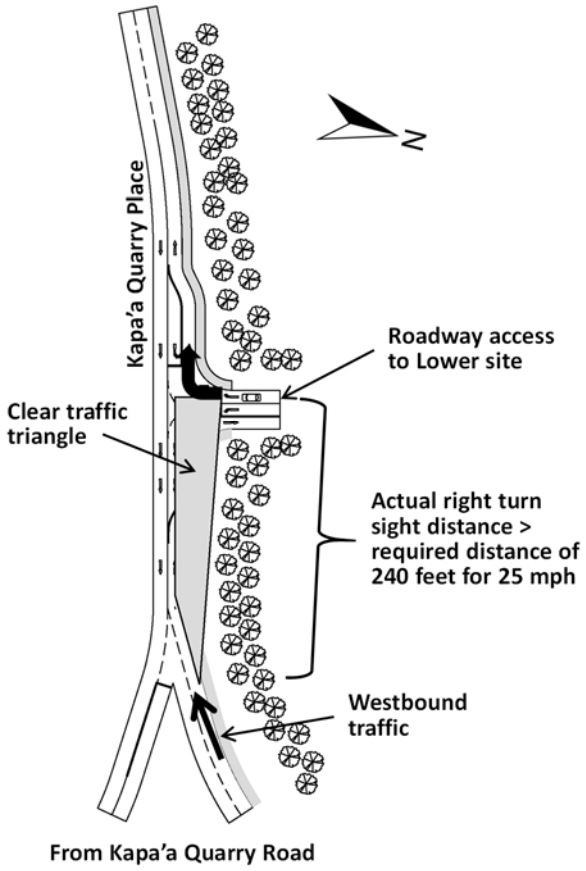


Figure 6.9.2.6: Sight distance assessment for **right turn** maneuver with Stop Sign Control

6.10 Modification of the Onsite Wastewater Treatment

This section describes the proposed modification of the onsite wastewater treatment and management system. The "approved onsite wastewater treatment system" refers to the conditions accepted in the "Special Management Area Use Permit No. 2014/SMA-27".

6.10.1 Approved Onsite Wastewater System

Under the approved onsite wastewater system, a Septic Tank Effluent Pumping (STEP) system was used. The STEP system is comprised of interconnected conventional septic tanks where the effluent of these conventional septic tanks is pumped to a centralized wastewater treatment facility rather than being discharge to conventional leach fields directly downstream of individual septic tanks.

Figure 6.10.1.1 shows the basic process diagram of the proposed STEP system. The wastewater treatment occurs in two process steps. The first treatment process step in the STEP system is a conventional septic tank, thus is like that of a conventional septic system. What is different in the STEP system is that conventional soil absorption fields (e.g., leach fields) which are located directly downstream of the septic tank are omitted. Instead, the septic tank effluent is pumped to a centralized treatment and disposal facility. The centralized treatment facility provides the second treatment process step.

The approved STEP system would utilize a recirculating sand filter as the centralized treatment. The treated effluent from the recirculated sand filter flows to either infiltration drain fields or, alternatively to irrigation, if irrigation is accepted as an additional treatment step.

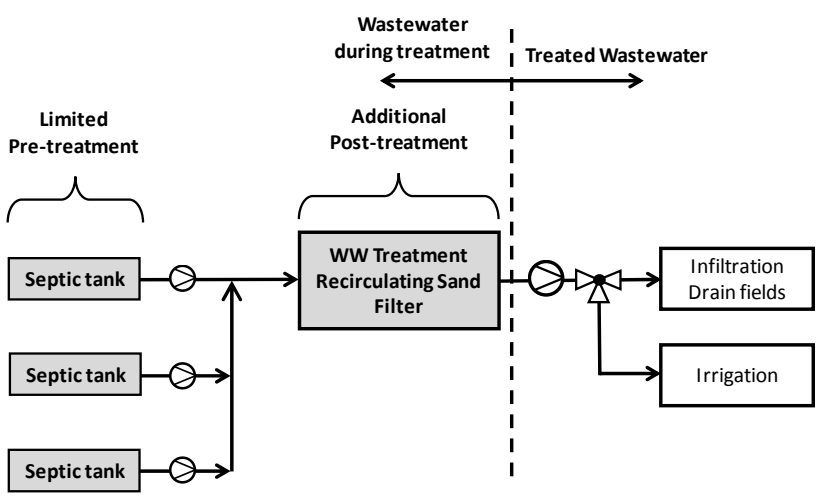


Figure 6.10.1.1 : Basic process diagram of a STEP system.

Figure 6.10.1.2 illustrates the STEP system layout under the accepted design approach. There were several septic tanks within the site. Multiple warehouse buildings were connected to different septic tanks. The central treatment system was a recirculating sand filter.

Figure 6.10.1.3 illustrates a basic working model of the proposed recirculating sand filter. The effluent from several septic tanks is pumped to the source tank of the recirculating sand filter units. Since the effluent that enters the system is only partially treated and without active aeration, the source tank is anaerobic. The water is pumped from the source tank to the top of the sand filter, where it is sprayed on the sand surface and percolates through the sand. The underdrain below the sand layer catches the flow and guides it back to the source tank from where it is recirculated. With the source tank being anaerobic denitrification process occurs. The treated water which is periodically withdrawn from the system is either infiltrated in a conventional leach field or used for drip irrigation, if possible, under the local jurisdiction. In accordance with the EPA typical residual pollutant level of the effluent from a recirculating sand filter is around BOD_5 10 to 20 mg/L. Higher BOD_5 levels indicate higher residual pollutant level in the treated effluent water.

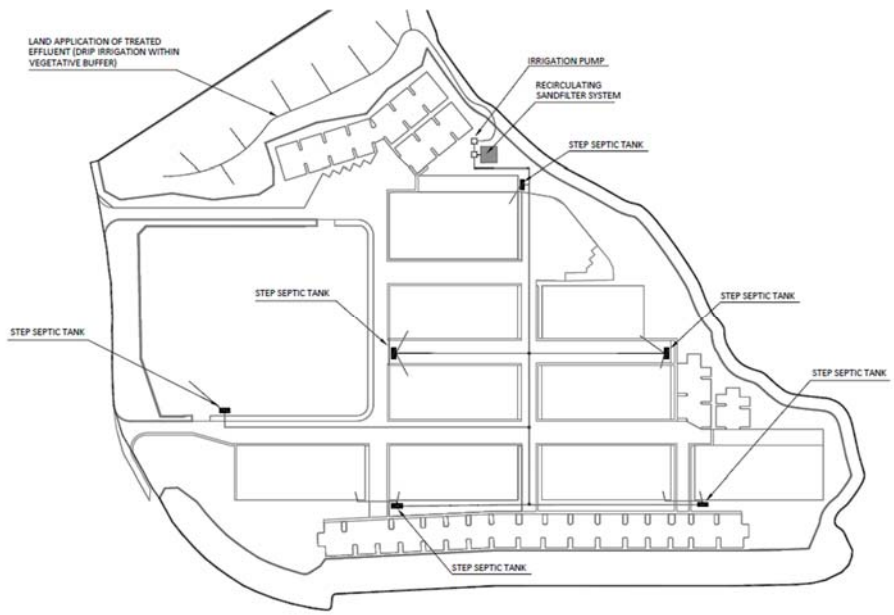


Figure 6.10.1.2: STEP system layout under the accepted design approach

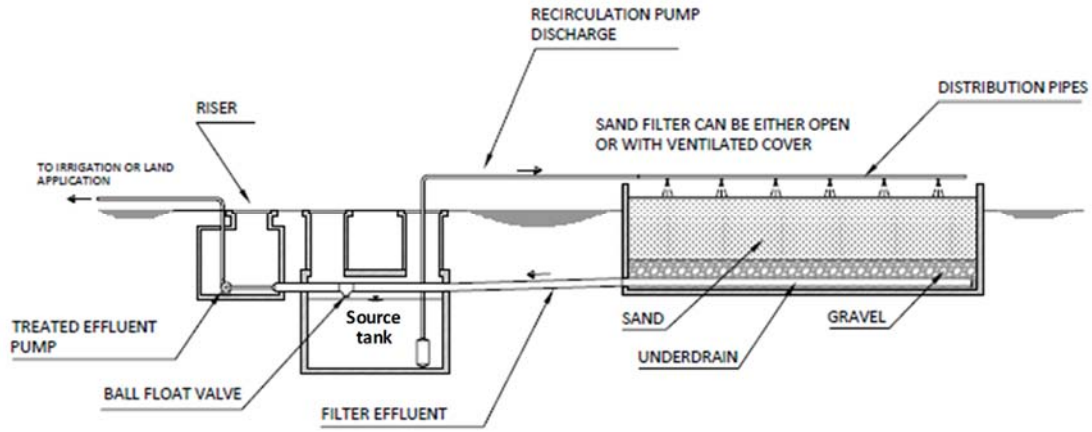


Figure 6.10.1.3: Illustration of the recirculating sand filter working model

6.10.2 Proposed Onsite Wastewater System

Several comments received on the DSEIS addressed the wastewater onsite treatment pilot project which is presently carried out in the Upper site in cooperation with and under supervision of the State Department of Health (DoH). The pilot project examines the Membrane Bioreactor (MBR) technology used for the KLIP in a specific project setting. The main objective of the pilot project is to verify that the treated effluent from the MBR system can be safely disposed of in infiltration fields which are smaller than the prescribed field size in HAR 11-62. The viability of using infiltration fields that are significantly smaller than soil absorption fields used for conventional septic systems has been proven in numerous applications on the US mainland.

The efficacy of using smaller infiltration fields for the MTD effluent is rationalized by the superior pollution reduction performance of MBR technologies, which produce a type of effluent which is significantly lower in residual pollutants than conventional septic system. Under conventional onsite wastewater treatment approaches, the overall treatment process efficiency incorporates treatment in unsaturated soil below the drain field. This treatment efficiency is added to the treatment in the process vessel. Since the treatment efficiency in the MBR system already surpasses that of entire multiple stage conventional onsite wastewater treatment systems, smaller disposal fields for the effluent are required. These smaller disposal fields for the MBR are designed for the hydraulic capacity of infiltrating water, similar to storm water infiltration.

Success of the pilot project will be to verify that smaller infiltration fields are sufficient to perform satisfactorily with the treated effluent from the MBR process units.

The proposed onsite wastewater system under the updated site development plan would use a treatment system that is certified under the New National Sanitary Foundation (NSF) standard 350. The NSF 350 standard allows certified system to use the treatment effluent for limited indoor and unlimited outdoor use. Recycling treated wastewater assumes a significant benefit of reducing valuable potable water for non-potable uses, such as irrigation or external cleaning of pavement, and other applications.

The NSF 350 compliant technology that would be used for the proposed onsite wastewater system is a Membrane Bioreactor (MBR) treatment unit. The typical residual effluent pollution level of the proposed system is equal or below BOD_5 5 mg/l, which is significantly Lower than the accepted effluent quality of BOD_5 from the recirculating sand filter.

Figure 6.10.2.1 illustrates the working process of the MBR treatment technology. The entire treatment process occurs inside the process vessel. The geometry of the MBR process vessel resembles a conventional septic system, but the tank volume is about 30% larger. The MBR process vessel contains a membrane unit with integrated effluent pump. As Figure 6.10.2.1 indicates, the effluent of the MBR system is treated water and can be directly pumped to infiltration trenches or to irrigation, when irrigation is applicable. It can basically be assumed that the effluent from the MBR system is equal in quality to treated stormwater runoff, but the difference is that disinfection of the treated wastewater must occur if there could potentially direct contact to humans, such as using sprinklers for irrigation.

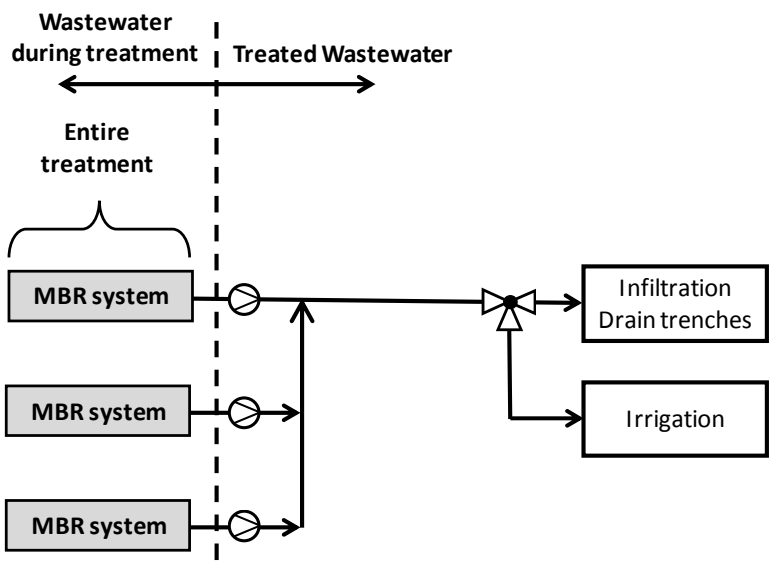


Figure 6.10.2.1: Basic process diagram of the MBR system at the site

One of the significant advantages is the reduction of soil absorption fields relative to conventional septic systems.

The reduction of soil absorption fields is since all treatment occurs in the MBR process vessel and that additional aerobic treatment such as in unsaturated and conventional soil absorption fields

Figure 6.10.2.2 shows a preliminary site map with six MBR systems distributed within the Lower site. Each MBR system would serve multiple buildings.

The effluent of each MBR system would be pumped batchwise to a central infiltration field or be used for irrigation, if applicable. Figure 6.10.2.3 shows a depiction of typical three compartment process vessel of a MBR system. The depicted MBR process vessel has three compartments, a pretreatment compartment (A), an anaerobic compartment for denitrification (B) and an aerobic aeration compartment (C). After aeration and recirculation within the anaerobic and aerobic compartments the treated water is pumped across a membrane and leaves the process vessel as an effluent with exceptionally low residual pollutant impurities.

The MBR technology for the proposed onsite wastewater treatment is presently tested by the owner at the project site to confirm performance under Hawaii condition. The testing at the project site is under a **pilot test program, which is endorsed by the Hawaii State Department of Health (DoH).**

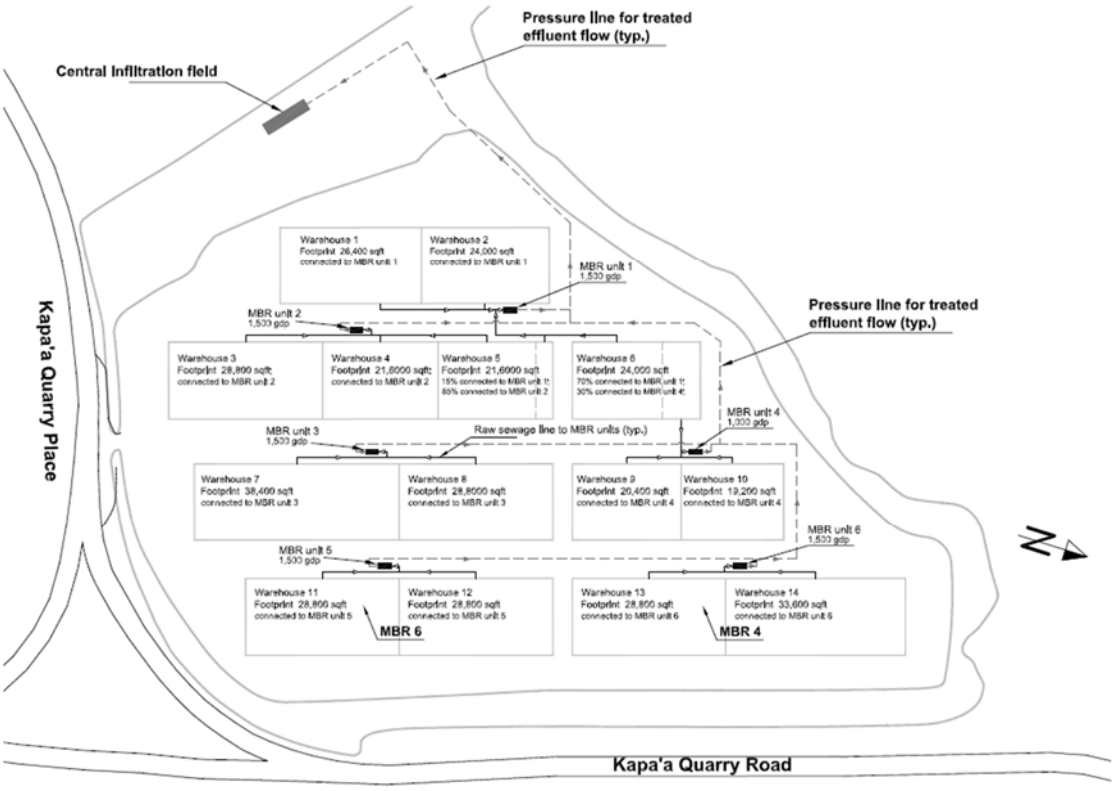


Figure 6.10.2.2: MBR system layout under the proposed design approach

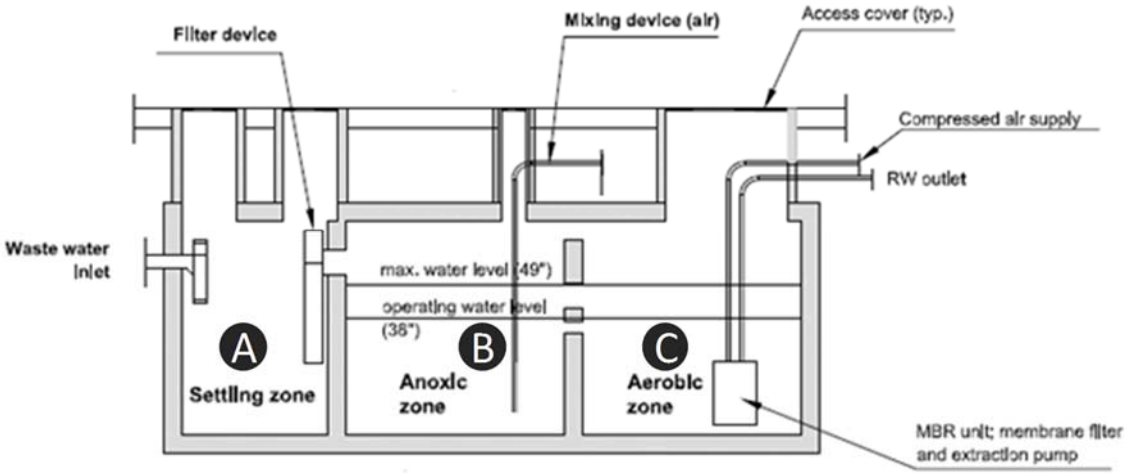


Figure 6.10.2.3: Illustration of the MBR technology used for the proposed onsite wastewater treatment

Conclusions:

The proposed onsite wastewater system uses a Membrane Bioreactor (MBR) treatment technology which is more advanced and more effective in pollutant removal than the wastewater treatment technology used for the accepted onsite wastewater system.

The treated effluent from the MBR system can be compared to treated stormwater runoff and has a low residual impurity level.

At the present time, the proposed MBR technology is being tested under a pilot project at the project site to verify favorable treatment results from previous mainland installations. The focus of the pilot project is the performance of the After successful completion of the pilot project the MBR technology would be used for all future onsite wastewater treatment installations.

Under the proposed wastewater management system, the treated water from the MBR systems would be pumped to a centralized infiltration field. The sizes of the infiltration field for the MBR effluent is significantly smaller than conventional soil absorption fields.

6.11 Assessing Impacts of Relocation a Powerline in the Lower Site (New Section)

This Section 6.11 is added to the DSEIS document.

This Section 6.11 describes the need to change the alignment of power lines that currently pass through the Lower site, several options for how this realignment could be accomplished, and the relevant impacts and associated mitigations which such a change in alignment would cause to the environment and the community.

6.10.1 Existing Alignment of the Power Line

The existing alignment of the 4 kV power line which supplies the project site with electricity (Kapa'a 4kV power line) passes through the Lower site is shown in Figure 6.11.1.1. The Kapa'a 4kV power line connects to an existing power line at the pole that is indicated as "A". From pole A, the Kapa'a 4kV power line crosses the Lower site to a point where it intersects the Eastern site perimeter. From this point the Kapa'a 4kV power line runs to the pole B. The Kapa'a 4kV power line continues from pole B to run Westwards along the Kapa'a Quarry Place towards the existing warehouse development in TMK 4-2-15:013 and 014 (upper portion of).

The approximately 1,400-foot section of the Kapa'a 4kV power line which needs to be rerouted runs between pole A and pole B. The existing Kapa'a 4kV power line will stay in operation until a new alignment will be installed that bypasses the section from A to B. The new alignment of the Kapa'a 4kV power line will run outside the buffer zone, and thus outside the site perimeter berms.

Figures 6.11.1.3 through 6.11.1.6 show close views of the existing Kapa'a 4kV power line. Figure 6.10.1.2 indicates the locations and directions of the viewpoints.

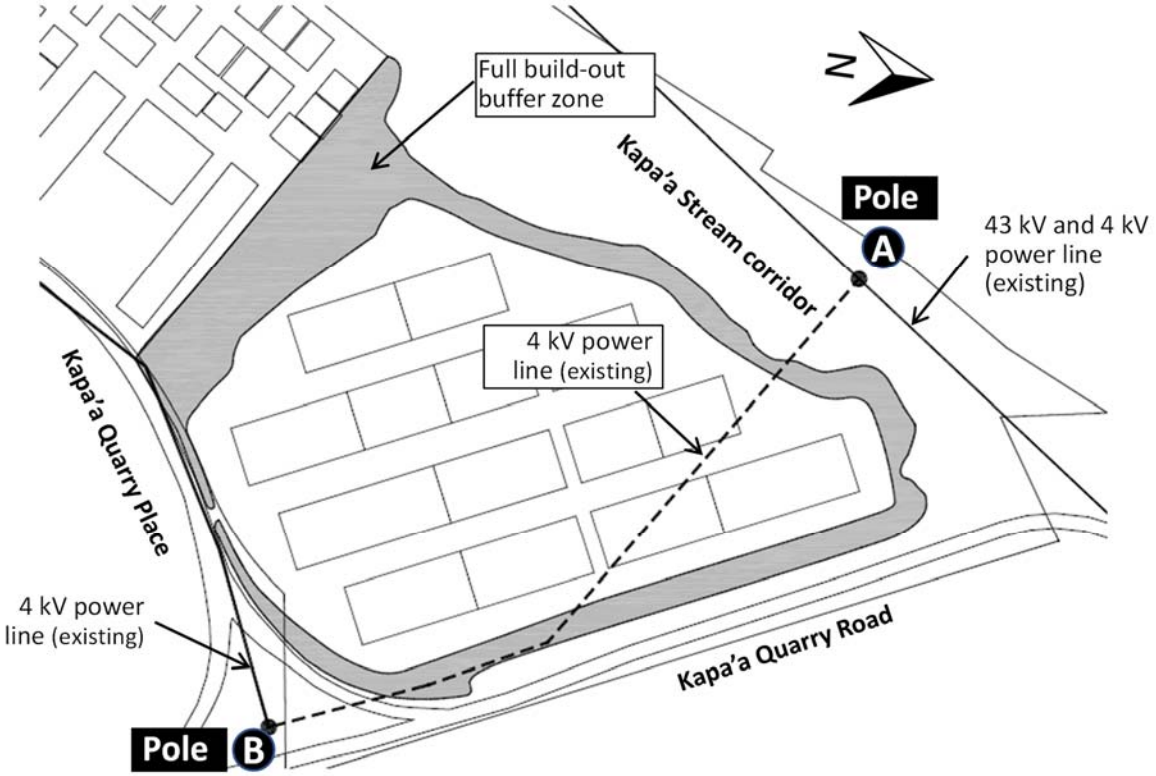


Figure 6.11.1.1: Existing Kapa'a 4kV power line (this Figure has been added to the DSEIS; refer to Appendix L)

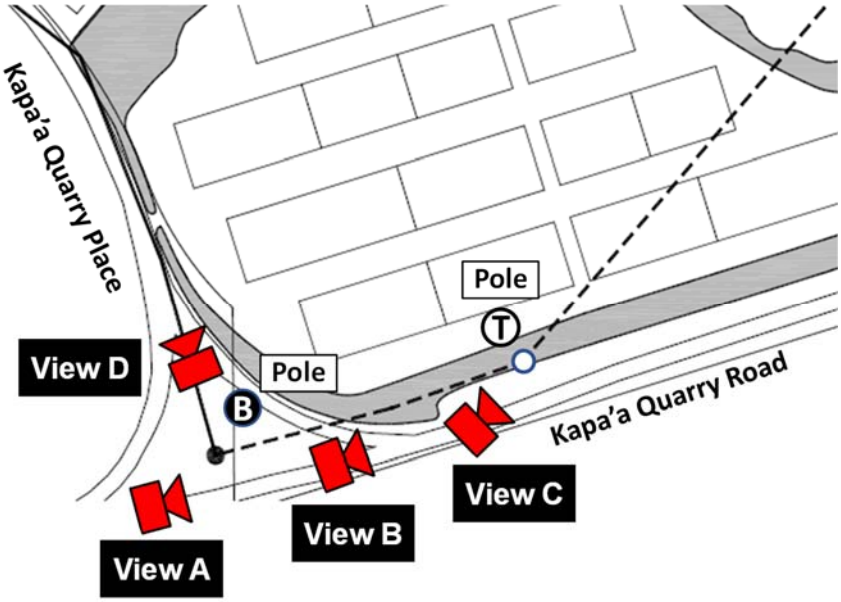


Figure 6.11.1.2: Views of the existing Kapa'a 4kV power line

The indicated camera positions A through D show the locations and direction of the viewpoints shown in Figure 6.10.1.3 through 6.10.1.6

(this figure was added to the DSEIS; refer to Appendix L)

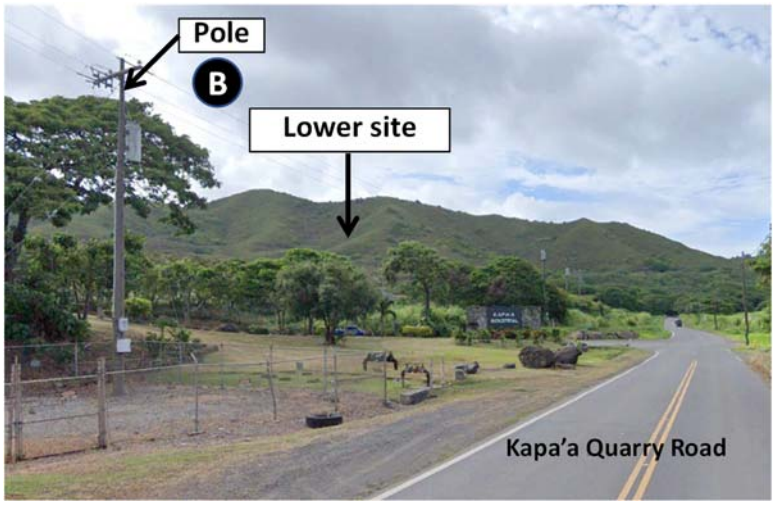


Figure 6.11.1.3: View A of the existing Kapa'a 4kV power line

The view is to the North along the Kapa'a Quarry Road. The Pole B is readily accessible.

(this figure was added to the DSEIS; refer to Appendix L)

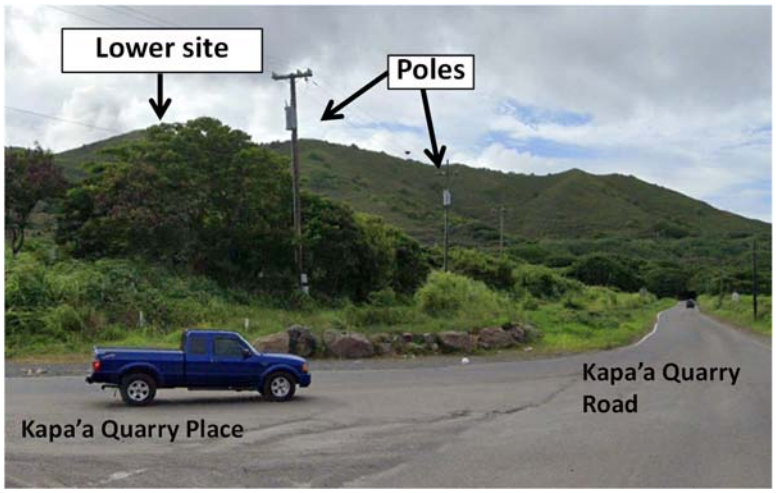


Figure 6.11.1.4: View B of the existing Kapa'a 4kV power line

There are two intermediate poles between the Pole "B" and "T".

(this figure was added to the DSEIS; refer to Appendix L)

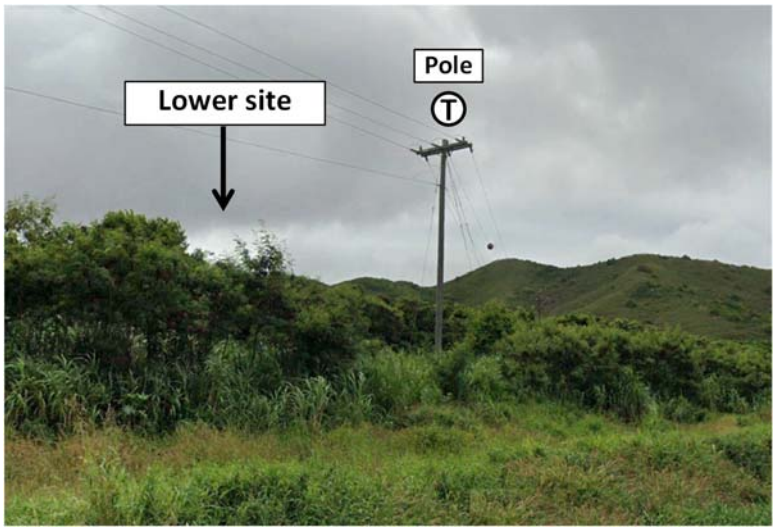


Figure 6.11.1.5: View C of the existing Kapa'a 4kV power line

The Pole T is the point where the alignment of the 4 kV power changes direction from parallel to the Kapa'a Quarry Road to passing over the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

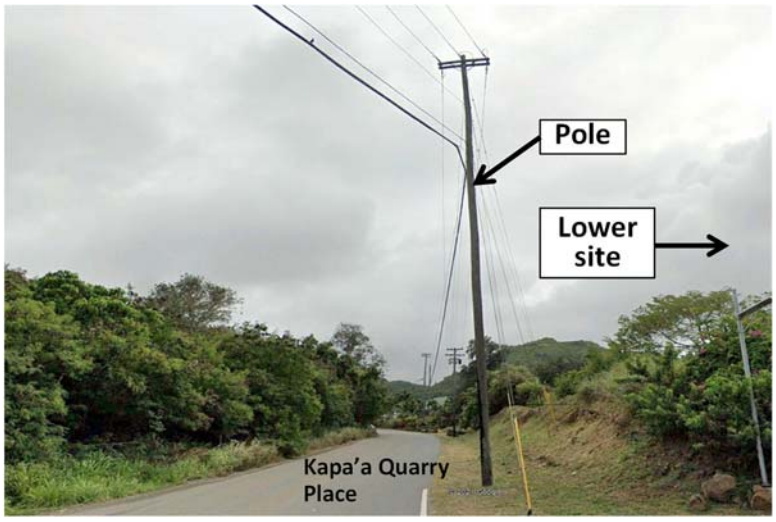


Figure 6.11.1.6: View D of the existing Kapa'a 4kV power line

The portion of the 4 kV power line to the West of Pole B will basically remain the same. The pole indicated in the foreground will have to be moved by approximately 50 feet to make space for the new road entrance to the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

6.10.2 Several Alternative Alignments Considered

Figure 6.11.2.1 shows three alternative alignments which are considered. In addition, the No Action alternative is shown as the current 4kV Kapa'a power line alignment.

No-Action Alternative: Under the No-action alternative the power supply to the Kapa'a Light Industrial Park, the 4 kV Kapa'a power line, would remain the same. The section of the 4 kV Kapa'a power line which passes through the Lower site would remain in places. Under the No-action alternative, the Lower site could not be developed. Therefore, the No-action alternative is not considered as a viable option.

Alternative A: Under Alternative A the 4 kV Kapa'a power line would connect to the Pole A of the existing 4 kV power line outside the Lower site. This means that the Alternative A of the 4 kW Kapa'a power line would connect to the same Pole A as the existing 4 kV Kapa'a power line. From Pole A, the power line would cross the Kapa'a Stream corridor and run in the East direction to change in direction to the South, along the Eastern boundary of the Lower site toward Pole B.

Alternative B: Under Alternative B the 4 kV Kapa'a power line would connect to the Pole C of the existing 4 kV power line outside the Lower site. This means that the Alternative B of the 4 kW Kapa'a power line would connect to a different pole as the existing 4 kV Kapa'a power line. From Pole C, the power line would cross the lower reaches of the Kapa'a Stream corridor and run to the South, along the Eastern boundary of the Lower site toward Pole B.

Alternative C: Under Alternative C the 4 kV Kapa'a power line would connect to the Pole C of the existing 4 kV power line outside the Lower site. This means that the Alternative C of the 4 kW Kapa'a power line would connect to a different pole as the existing 4 kV Kapa'a power line. From Pole C, the power line would cross the Kapa'a Quarry Road and run to the South, along the Eastern side of the Kapa'a Quarry Road toward Pole B.

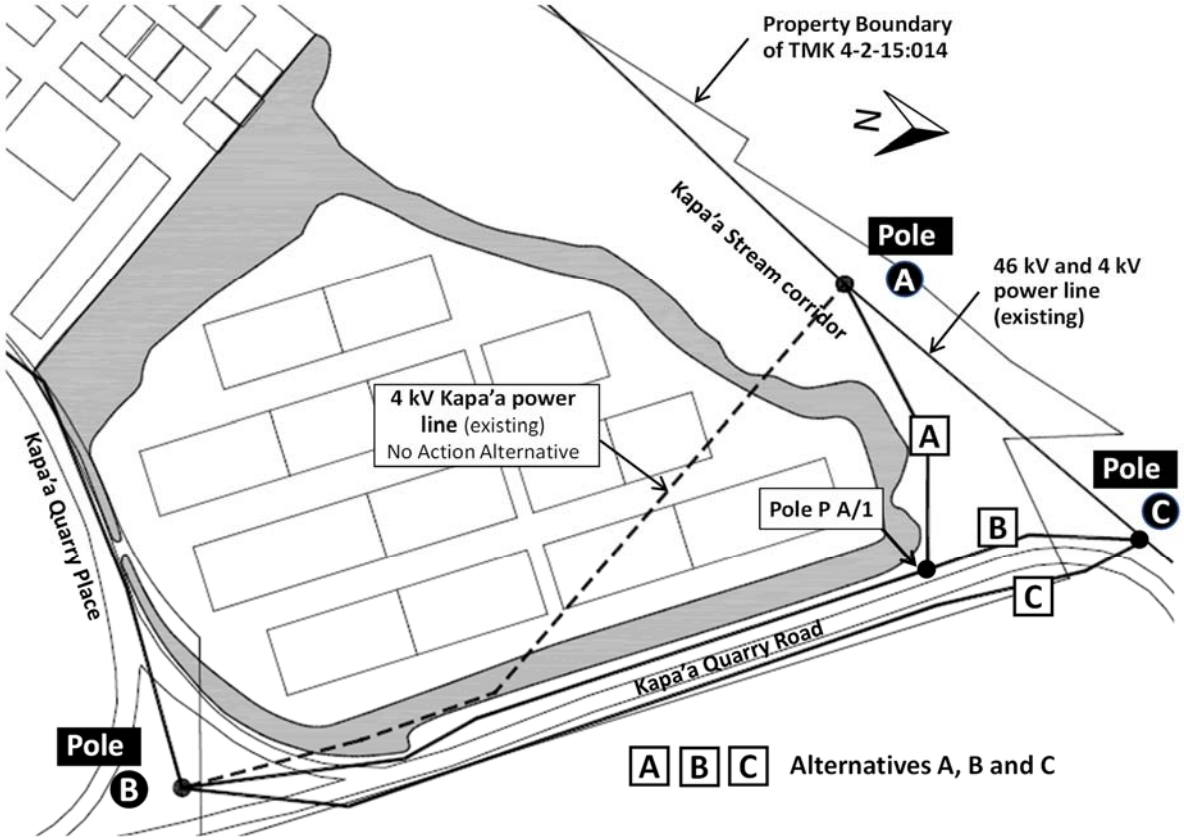


Figure 6.11.2.1: Alternative alignments A, B and C of the 4 kV Kapa'a power line to Pole B; (this figure was added to the DSEIS; refer to Appendix L)

6.10.3 Assessment of Impacts

Appendix L presents a comprehensive impact assessment. A summary of the main findings include:

The existing section of the 4 kV power line that supplies the KLIP and the Kapa'a Transfer Station with electricity that passes through the Lower site must be removed from the Lower site and substituted with a new section of the power line that is outside of the Lower site.

Appendix L refers to choosing one of the options for proposed relocation of the 4 kV Kapa'a power lines as the "proposed action". Appendix L describes the expected impact of each of the several options for the proposed relocation of the 4 kV Kapa'a power lines, including:

- Air Quality
- Geology and Soils
- Aquatic Resources
- Botanic Resources
- Wildlife Resources
- Historical and Cultural Resources

- Visual and Aesthetic Resources
- Traffic Impacts

In Appendix L, a detailed environmental impact and mitigation review of the proposed 4 kV Kapa'a power line relocation was performed for alternatives B and C. The findings include:

- Air Quality: There would be no long-term adverse impacts to air quality under both alternatives. have Temporary impacts to air quality from construction as well as cumulative impacts would be negligible.
- Geology and Soils: No significant long-term impacts are expected, and impacts would be temporary during construction.
- Aquatic Resources: Under Alternative C, possible minor impacts could exist with aquatic resources in the Makai drainage ditch during installation of poles. Under Alternative B, the likelihood of such impacts would be smaller. Under both alternatives, the Proposed Action would have short-term impacts and no long-term impacts would be expected.
- Botanic Resources: Under both alternatives, the effects on botanical resources would be short-term during installation of the poles and the conductors. The Proposed action is not expected to cause significant long-term effect on botanic resources. Some trees would require long-term maintenance to keep branches away from the power lines.
- Wildlife Resources: Effects on wildlife during construction are expected to be small and only last a short time. Avoidance would contribute to lower direct impacts. Long-term effect could cause impacts to birds colliding with electric lines, which would be more pronounced under Alternative C. Some mitigation measures could be used to lower the incidence of bird collision through suitable line marking and placing the conductor in a horizontal position thereby lowering the lateral impact area.
- Historical and Cultural Resources: Under both alternatives, historical and cultural resources would technically not be affected. It must be mentioned, though, that Alternative C is closer to the delineated boundaries of the Kawainui Marsh, a state treasure..
- Visual and Aesthetic Resources: Under both alternatives, there will be some level of visual impact, with the long-term impacts more pronounced. The short-distance visual impacts caused by the Alternative C would be more noticeable than under Alternative B due to the different distances of the poles from the roadway. Long-distance visual impacts will be comparable, since under both alternatives the poles will blend into the background of the new vegetated site perimeter berms. Visual impact-mitigation measures will be available to lower possible negative visual experiences.
- Traffic Impacts: Under Alternative C, there would be short term and long-term impacts on the traffic flow and safety on the Kapa'a Quarry Road. The short-term impacts would be traffic impacts due to closure of one traffic lane. Long-term effects would be impacts on traffic safety due to installing poles close to the roadway. The short-term impacts would be mitigated by traffic controls and the long-term impacts would be mitigated by keeping the poles a far away from the edge of the roadway as is possible considering the limited width of the Makai shoulder. Under Alternative B, only some short-term traffic impacts would occur and no long-term impacts. These short-term impacts are considered unavoidable and minimal.

CHAPTER 7 - CUMULATIVE & UNAVOIDABLE IMPACTS, SHORT-TERM USES TO LONG-TERM PRODUCTION , UNRESOLVED ISSUES

Chapter Six of the 2011 FEIS described cumulative and unavoidable impacts, short-term uses to long-term production and unresolved issues. This SEIS document updates these issues and describes developments of the Proposed Action to resolve them.

7.1 Relationship between Short-term Uses and Long-term Productivity

Section 6.1 of the 2011 FEIS described that site development and construction of buildings on the proposed site would require short-term uses of land and other resources. The description included how short-term uses of the Proposed Action would affect the long-term productivity of the natural and human resources.

The terms "short-term" refers to temporary impacts during construction and site development of the proposed project and "long-term" refers to the impacts of the proposed project during its operational life. The relationship between short-term uses and long-term productivity would not be appreciably different between the two SEIS alternatives.

7.1.1 Short-term and Related Impacts

Section 6.6.1 of the 2011 FEIS described that the site development and construction of buildings of the proposed light industrial park would result in short-term construction-related impacts. Such impacts would be caused by interference with traffic on the affected roads and intersections, increased air emissions through the generation of limited dust and the use of construction equipment, increase in ambient noise levels by the increased traffic and construction activities, disturbance of wildlife as well as increased stormwater runoff. These impacts would be temporary and would occur only during construction and site development work of the proposed park. These impacts were not expected to alter the long-term productivity of the natural environment. Impacts during the construction are also described in Chapter 4 of this Final ~~Draft~~ SEIS.

The planned site development approach of the Proposed Action can be divided into two different categories or phases of short-term impacts:

> Phase 1 - impacts from work associated with site preparation: These impacts would include grading, construction of roadways, parking areas and other traffic areas, installation of utilities, landscaping, and construction of vegetated perimeter berms of the project site. Since most of the soil disturbance would occur during Phase 1, most of the related impacts would happen during this phase. The relocation of the 4 kV Kapa'a power line would occur in this phase, since the existing poles have to be removed from the site to allow operation of heavy grading equipment and the fill to build up to the full build-out elevation.

Phase 2 - impacts from the construction of individual warehouses and ancillary structures: These impacts would include construction of the building shell, the development of the area in immediate vicinity of buildings and the build-out of the interior of the warehouse to fit the tenant's needs. While the construction of individual warehouses would require about 3-4 months each, warehouses are installed one after the other, with periods of no construction activities between. The 2011 FEIS estimated the time for all buildings to be added to the proposed development of about approximately 15 to 17 years. The actual duration would be subject to the rate at which industrial space is absorbed in the region. With an estimated 15 to 17 years, the 2011 FEIS predicted completion date would be around 2028 the latest. Since the time of the FEIS approval, the project has been phasing in according with community demand. As a result, the completion date may be beyond 2028.

7.1.2 Long-term Productivity Benefits to the Local Economy

Section 6.1.2. of the 2011 FEIS described long-term benefits of the proposed action.

The Proposed Action would increase long-term productivity of the Koolau Poko region by strengthening the economic infrastructure and assist in diversifying the local economy. The 2017 Koolau Poko Sustainable Communities Plan acknowledges the need for small light industrial spaces in the Kapa'a Quarry area. Based on the planned future site development data of the 2011 FEIS the proposed project would create about 600 additional new full-term positions to the region. Based on the market study referenced in the 2011 approximately 60% - 70% of the new positions in the proposed light industrial would be filled by residents of the region. The 2011 FEIS estimated County and State taxes was $1.9 million and $8.8 million, respectively.

An important objective for a more sustainable Hawaii is the reduction of miles travelled to save petroleum, and thus carbon that accelerates climate change. Locating the place of employment, commerce, and recreation closer to the residents is one measure that is regarded as effective to lower traffic volume on an island wide level. The proposed project would provide industrial space to businesses, especially smaller local businesses, so they can grow while relocating to more cost-effective places of doing business within the region.

Any discussion about long-term productivity would need to consider the important goal for Hawaii of implementing more sustainability, including building sustainably. Important foundations of a sustainable Hawaii include the diversification of the local economy, increasing local production of food and goods, conserving energy, and water as well and imports of petroleum.

The low-impact development of the Proposed Action would serve as an important example that industrial development can occur in an environmentally friendly way, and in a manner that is supportive and respectful to the community and its cultural values.

7.1.3. Relationship between Short-term Uses and Long-term Productivity of the Environment

Section 6.1.5 of the 2011 FEIS described the relationship of short-term uses and long-term productivity of the environment for several areas of significance.

Land Use: Under the SEIS Preferred Alternative, construction of the proposed project would convert land from pervious to impervious area. The 26 acres of land that will be converted to impervious land is entirely located on former and not redeveloped landfill area, so no presently open space with vegetation, agricultural land or land with mature trees will be lost. Furthermore, no aquatic resources or wetland areas would be converted to impervious and non-vegetated land. Part of the sustainable design approach of the Proposed Action would be the conversion of approximately six acres of the proposed site to restored habitat at the perimeters of the project site.

In the restored habitat, the current invasive plant species would be removed and replaced by native or adaptive plants. The net result of the long-term productivity of the environment would be positive since the quality of the restored habitat at the site perimeter would be increased from the present conditions.

Water Resources: Construction of the Proposed Action would result in short-term disturbances to surface water and ground water resources. There would be no disturbances to floodplains, designated wetland areas and water bodies. There would be no long-term loss of functions, such as erosion and flood control, water-quality protection, aquatic habitat, recreational uses and aesthetic appearance of adjacent wetland areas and water bodies. No major construction activities would be inside or adjacent to water bodies and the only construction activity planned near water bodies would involve the installation of several outfalls for treated stormwater discharges to the Kapa'a Stream corridor.

This limited construction could involve minor modification of the stream banks or boundaries of wetland areas, and any fill to be deposited into stream beds or wetland areas will be only incidental. The size of the areas near water bodies that might be affected by construction would be small in relation to the overall area of adjacent wetland area and water bodies and would therefore not affect long-term productivity of the area.

Under the SEIS Preferred Alternative, the proposed stormwater treatment and management system would result in a long-term improvement of the runoff to the receiving waters - with resulting improvements of current impacts on water quality, stream bed erosion and subsequent sedimentation in the downstream marsh. This would improve the long-term productivity of the water bodies directly affected by the proposed project.

Biological Resources: The construction of the Proposed Action would result in some short-term and long-term impacts to some vegetation and wildlife resources. During construction, some vegetated areas at the perimeter of the site (mostly those containing invasive plant species) would be removed and replaced with a wider buffer zone on the new site perimeter berms. The berms would be panted with native and adaptive species. Efforts would be made to leave mature trees at the perimeter of the site and not remove them. Measures would be taken that these trees would not be damaged during construction.

The time to replenish the size of vegetation that would be removed at the site perimeter is estimated at about 3 to 5 years; therefore, no long-term loss of habitat would occur. There is

currently a population of non-native wildlife on the not yet developed portions of the site, such as feral cats and domesticated birds, which make a home primarily within the existing unimproved site perimeter. During construction, this wildlife population would likely avoid the location, but it is expected that the domesticated bird population would soon return and find a more extensive habitat in the restored habitat at the site perimeter. The Applicants' plan to control the feral and non-native wildlife populations with predator management programs that would be designed and implemented following guidelines of the U.S. Fish and Wildlife Service (USFWS).

The project site is adjacent to the Kawainui Marsh, which is home to several federally listed water birds. The proposed site itself, especially the land that would be used as the development footprint for new warehouses, is presently not identified as habitat for endangered species. The design approach would implement measures to avoid attraction of endangered water birds to the developed land. Such measures, which have been proposed by the USFWS, would include site design approaches avoiding open water surface ponds within the proposed project site. Implementing such measures would avoid attracting endangered wildlife to the project site where they could be subjected to increased predator threats.

Concluding, the long-term productivity for biological resources would not be adversely affected by the proposed action.

Traffic related impacts: During construction there would be traffic due to trucks transporting construction material or equipment to and from the project site as well as from construction personnel driving to and from the site. Grading within the Upper portion of the site would be minimal since this part of the site is already formed as a near even plateau. Grading in the Lower site would be significant, due to an increase of finish grade elevation of the site by an average of 11 feet.

After full build-out, the Proposed Action would result in increases of traffic on the adjacent roadways and affected intersections. A TIAR that was used for the 2011 FEIS estimated that for the immediate future the increase in traffic to remain under the level of service (LOS) threshold that would imply significant traffic impacts on the adjacent Kapa'a Quarry Road. The increased traffic volume would cause some long-term impacts regarding traffic-generated air quality and noise impacts, as well as increased incidences of accidents and wildlife collisions.

Furthermore, in its current condition, the Kapa'a Quarry Road could cause some problems relative to road safety. The increased traffic volume generated by the Proposed Action might increase the magnitude of these road safety problems if not mitigated. Long-term loss of productivity of the environment caused by increased traffic would include avoidance of wildlife resulting in loss of habitat. Chapter 4 of this SEIS document suggested some traffic impact mitigation measures, which included measures to control the speed on the quarry road and raising the awareness of drivers to drive responsibly to avoid accidents and incidences of wildlife killed by traffic.

Air quality and noise: During construction there would be impacts on the air quality, such as fugitive dust and engine exhaust, caused by soil disturbance and construction equipment. There also might be potential impacts from accidental leaks or spills from hazardous substances, such as fuel.

Measures will be implemented to minimize impacts of any leaks or spills by using appropriate mitigation measures.

Emission from harmful paints and solvents would be minimized by selecting only those paints and other construction material that are low in volatile organic compounds (VOC), in accordance with the sustainable design approach and the LEED certification goals. After construction there would be increased air quality impacts resulting from the increase in traffic, as delineated in Chapter Four.

During construction, there would be short-term noise generated by construction equipment and activities as well as by construction related traffic. The level of noise generated during Phase 1, Site Development, (e.g., from heavy equipment), would be higher than noise during Phase 2, Construction, when individual warehouses would be built on the prepared site. Therefore, the most noticeable short-term level noise would occur during a period of approximately three to four months for each warehouse. Short-term noise during construction of the individual warehouses would be exclusively generated during the construction of the building shell, which would take about two months per warehouse structure.

The build-out of the interior of warehouses, which follows the construction of the building shell, would result in marginal increases of short-term noise levels. Long-term noise during operations could be mitigated through several measures that include orienting large warehouse doors away from the marsh, installing noise barriers to shield adjacent areas that are most sensitive, housing noisy equipment indoors or under noise attenuating containments, and avoiding unnecessary idling of heavy trucks.

Concluding, the long-term beneficial effects of the proposed project would outweigh potentially significant yet short-term noise impacts resulting primarily during initial construction and site preparation. Appropriate mitigation measures could significantly Lower related negative impacts. Since there would be more site development, including grading, and more warehouse space to construct, related impacts would be higher under the SEIS Preferred Alternative than under the SEIS No-Action Alternative.

7.2 Irreversible and Irretrievable Commitment of Resources

Section 6.2 of the 2011 FEIS described irreversible and irretrievable commitment of resources for the proposed action.

An irreversible commitment of resources indicates a loss of future options, such as consumption of a non-renewable resource or of a resource which is only renewable over a long time. On the other hand, an irretrievable commitment of resource indicates functions of a resource that cannot be exercised for the duration of the project. For the sake of brevity, it is assumed that irreversible and irretrievable commitments of resources would not significantly differ between the SEIS alternatives. In cases where there are significant differences between the two action alternatives, the SEIS Preferred Alternative is described directly.

The development of the Proposed Action would result in commitments of resources. Some resources committed could be recovered in a relatively short period of time, while in other cases, resources would be both irreversibly and irretrievably committed by virtue of being consumed or by the long of period that resources would be committed to the proposed action. Resources expended for the development of the proposed project would be offset by the creation of needed facilities and the resulting benefits to the region. Benefits of the Proposed Action would augment the economic viability of the Koolau Poko region and would provide urgently needed industrial space for light industrial activities.

Land use: The conversion of pervious to impervious land could be considered irreversible commitment. Measures would be implemented to reverse some of the adverse impacts by implementing rainwater harvesting and use of collected rainwater for irrigation. The portion of the project site that would be converted from pervious to impervious land is not of environmentally high value. The land that will be used to construct the proposed project was created by landfill and no previously undeveloped open space, agricultural land or wildlife habitat would be used. The proposed industrial park would be developed in accordance with sustainable project development. The project team would implement building approaches that would be consistent with the intent and objectives of sustainable site development.

Biological resources: Biological resources lost during the development are expected to be minimal and not irreversibly lost. Rather, the biological resources would be irretrievable for the duration that it takes for the vegetation to regenerate. The types of wildlife found at the project site before site development would leave the project site during site development and construction of warehouse buildings and would mostly return afterwards. It is expected that the vegetation reintroduced at the site perimeter would require approximately five years to reach the comparable size and structure of the current average vegetation at the site perimeter. The restoration of currently sparsely vegetated land at the site perimeter would augment biological resources and diversity at the site.

Surface water and groundwater resources: Changes in site drainage and harvesting of rainwater for subsequent use in irrigation could be considered as irretrievable commitment of water resources. To offset this, capturing rainwater used for irrigation would result in a reduction of storm water runoff because of evapotranspiration.

Energy and materials: Construction and operation of the proposed project would result in irreversible commitments of energy and materials. The Proposed Action would require energy in form of electricity and transportation fuel, mainly diesel fuel. Since, on average, approximately 80% of electricity on Oahu is generated by fossil fuel, most of the electricity used during construction and operation would be considered irreversibly committed. Under the SEIS alternatives, a significant amount of renewable energy would be generated onsite; therefore, this portion of energy used would be considered irretrievably committed. The construction of the proposed project would require an irreversible commitment of various construction materials, such as aggregate, concrete, steel, wood, and other building materials. Some of building material might be recyclable or represent rapidly renewable material, but these materials would still be considered irreversibly committed.

Construction waste: The disposal of construction and demolition debris in landfill can be considered as irreversible commitment of landfill area. As part of the low impact development approach and LEED certification goals, a portion of the construction and demolition debris would be reused or recycled. Therefore, the scope of irreversible use of landfill would be reduced.

Transportation Fuel: The construction and operations phases of the proposed project would result in irreversible commitment of fossil fuels such as diesel fuel and gasoline for the transport of goods and for transporting people to and from the proposed site. The proposed project would also reduce the number of miles travelled by avoiding long commutes and trips between windward and leeward Oahu by employees and customers of businesses that relocate to the project site. Therefore, the irreversible commitment of transportation fuel and greenhouse gas emissions associated would be reduced to some extent on an island wide level.

Visual Impact: The construction of the Proposed Action would cause irreversible and irretrievable changes in near and distant views from view planes around the Kawainui marsh, Kailua town, H3-Freeway, and roads adjacent to the project site. The proposed visual impact mitigation, such as the vegetative buffer zones around the site perimeter along the Kapa'a Quarry Road would significantly reduce the intensity of the visual impact from view planes on the adjacent roads and around the Kawainui Marsh. The reduction of visual impacts would be to such an extent that the proposed project would essentially be camouflaged behind a screen of thick vegetation and earth berms. The proposed visual impacts mitigation measures could not, however, completely mitigate the visual impact from portions of the adjacent H3-Freeway.

7.3 Significant and Unavoidable Impacts

Section 6.3 of the 2011 FEIS described aspects of significant and unavoidable impacts from the proposed action. These significant and unavoidable impacts would be effects on natural resources and humans by the proposed action. The significant impacts would be mitigated using the most effective measures that could be considered practical. Most of the significant adverse impacts could be reduced to a less-than-significant levels, but some unavoidable impacts would remain even after using mitigation measures.

The following describes significant impacts and to what extent these could be mitigated. Some impacts would have consequences that are identified as unavoidable, to some extent, even with mitigation measures. Most of the unavoidable adverse impacts would not vary substantially between the two SEIS action alternatives, though the SEIS Preferred Alternative would offer a more comprehensive and effective range of mitigation measures.

Different types of significant adverse impacts and unavoidable consequences are summarized in the following:

Soils: During construction, a fraction of the topsoil that would be graded, stockpiled, and replaced would be mixed, buried, or lost from the site because of wind and water erosion, which could result in a significant impact if not mitigated properly. It is the responsibility of the contractor to implement and maintain comprehensive erosion control strategies to properly mitigate the impact to less-than-

significant levels. While the grading and stockpiling of soil would result in impacts, the final soil condition would improve and reduce longer-term impacts.

Before development, the surface soil condition at the project site consisted of graded layers of coarse gravel. There was a limited vegetation cover within the area of the Lower portion of the site that would be used for site development and the construction of warehouses. This current vegetation cover is not a permanent and continuous cover and therefore is not an effective soil stabilization method. The vegetation cover consists of invasive plant species that grow on parts of the site which are not used for outdoor storage or stockpiling of inert material. With the stated mitigation measures impacts on soil would be reduced to less-than-significant levels.

Traffic: Construction and operation of the proposed light industrial park would cause increased traffic volume and would therefore affect traffic volume on two adjacent roadways and at three intersections that are directly affected. Based on a traffic impact analysis report (TIAR) conducted for the 2011 environmental review, the level-of-service (LOS) on the adjacent Kapa'a Quarry Road and the Kapa'a Quarry Place roadways as well as at three affected intersections would remain at a less-than-significant level through the mid-point of development schedule for the proposed project, even without mitigation measures. With the projected growths in background traffic and traffic volume generated by the proposed project, at the time of full build-out, the LOS would, however, fall below a threshold value and would result in adverse traffic impacts, if no mitigation measures were taken. Properly designed mitigation measures would be implemented at a time after the mid-point of the development to reduce the impacts to less-than-significant levels. Heavy-truck traffic would require extensive mitigation measures to reduce impacts below significant levels.

To have more up-to-date information for the selection of future traffic impact mitigation measures Applicants have agreed to carry out a follow-up TIAR. As stated earlier, the DoT had requested in the 2011 FEIS that the current TIAR be revised later in the project.

Air Quality: Construction of the Proposed Action could cause significant impacts to air quality. During the construction, especially the site development of the Lower portion of the site, soil disturbance and vehicle traffic on unpaved roads would produce short-term fugitive dust emissions. Construction equipment would emit tailpipe emissions, including particulate matter from equipment and vehicles with diesel engines. The general contractor would be required to reduce emissions through good operational practices, which would include, but would not be limited to:

- watering or chemical stabilization of unpaved roads and disturbed soil areas,
- avoiding soil track out on adjacent roadways through a dedicated tire wash installation and other additional means,
- posting speed limits, discourage equipment idling, establish speed limits, using well maintained equipment and
- scheduling construction activities to reduce multiple emission sources occurring simultaneously.

With the stated mitigation measures, the air emissions generated during construction would be effectively limited in time and intensity to less-than-significant levels.

During the operations phase of the proposed light industrial park, impacts to the regional air quality would be caused primarily by traffic at the proposed project and on adjacent roadways. Mitigation measures would be implemented to reduce such impacts to less-than-significant levels. Some minimal air emissions caused by operations at the project site could result in adverse impacts, which should be properly mitigated. The type of industrial activities under land use category Limited Industrial (I-1), would exclude any business activity that will generate significant sources of air emissions through the release of harmful air borne agents.

Noise: During construction, there would be an increase in ambient noise. This would be a short-term adverse impact because of the temporary nature of the construction phase. During normal operations of the light industrial park, standard levels of noise impact from heavy truck and vehicle traffic would create noise impacts. Traffic noise would adversely impact unpopulated areas at the Western perimeter of the Kawainui marsh.

Residential areas would not be affected since increased traffic, especially heavy truck traffic, would not traverse residential areas. Noise could affect wildlife, which might increasingly avoid the area close to areas with high noise. The increase in traffic generated by the operation would be gradual, however, and be linked with the rate at which new buildings are constructed. Noise associated with the operation of the light industrial park levels would therefore increase gradually which would limit the degree of wildlife avoidance from the area. Habituation to noise typically occurs when wildlife gets accustomed to noise.

Native Vegetation/Wildlife habitats at the project site: Clearing existing vegetated land at the perimeter of the site would result in short-term changes in the composition and structure of the vegetation and therefore could result in adverse impacts. The development plans include restored habitat at the site perimeter, which would replace the existing earth berms and its invasive vegetation.

It is an unavoidable impact that the protective function of the existing earth berms and vegetation thereon would be lost for the duration of 3 to 5 years until the native and adaptive plant species of the restored habitat at the site perimeter could offer the same extent of visual impact mitigation. After the 3 to 5-year period, the restored habitat would offer better habitat and visual impact mitigation than under the existing conditions. While the vegetative buffer zone at the perimeter of the site is regenerating, some domesticated birds at the site would be disrupted to a certain extent and the existing population of birds at the site would be reduced. After the restored habitat can provide the required basic habitat conditions for domesticated birds, the population would be expected to return and thrive more than at the present, because a planned control program would remove a part of the feral predators (i.e., feral cats, rats, etc.).

Impacts to endangered species: At the present time, the proposed site is not a habitat for endangered water birds which use the adjacent Kawainui Marsh as habitat. Under earlier site development strategies, there was a risk that endangered water birds could be attracted to open water ponds within the proposed project, and, as a result, could face increased predator risks. Consequently, the

Proposed Action has changed the configuration of detention ponds to underground detention vaults. Upon communication with the U.S. Fish and Wildlife Service, these mitigations will reduce the impacts to endangered species to less-than-significant levels.

Light pollution: Light pollution is defined as a significant adverse impact associated with light from the site shining into adjacent areas or up into the sky. Light pollution can adversely affect wildlife by reducing their ability to navigate and move effectively, reduction in habitat through avoidance and, indirectly, reduction in food supply (insects). Light pollution can adversely affect humans by glare and sky-glow, which can cause adverse impacts on traffic and night sky access.

As part of the sustainable design approach, the proposed project would implement measures to control interior and exterior lighting to achieve effective light pollution mitigation, especially within the Lower portion off the site that is adjacent to the Kawainui Marsh and wetland areas in the Kapa'a Stream corridor. The exterior lighting would adopt the most stringent standard "Dark", which is recommended, for example, in national parks, and exterior light density would only be used for safety and comfort with negligible amounts of light trespassing the site boundary. With the appropriate mitigation, light pollution impacts can be reduced to less-than-significant.

Land Use – Conversion to impervious land: At full build-out, about 46 acres of former landfill area would be utilized to develop the proposed action. Under the SEIS Preferred Alternative, approximately 19 acres of the Lower site would be converted from pervious to impervious land, through construction of impervious roadways and building rooftops. The rest of the approximately six acres within the development footprint would remain pervious and vegetated landscaped area. While mitigation would reduce impacts, the conversion from pervious to impervious land would be an unavoidable impact.

Although sealing the surface of the former landfill with impermeable surface layers and restricting the infiltration of surface water into the landfill would cause unavoidable impacts, the results of this action would be positive.

Sealing the cover of redeveloped landfills significantly reduces the generation of harmful leachate in the landfill body, thus reduces impacts to the aquatic resources.

Land Use – Conversion to industrial land uses: Portions of one of the two contiguous land parcels on which the Proposed Action would be built, TMKs 4-2-15:013 and 014, were rezoned after the 2011 FEIS was approved. Rezoning of these approximately 30 acres was from General Preservation (P-2) and Limited Industrial (I-1) land use. The land area that was rezoned was approximately 38% of the combined area of the two land parcels. The conversion of preservation land to industrially zoned land was an unavoidable impact to implement the industrial park.

Water Quality Impacts from stormwater runoff: Significant adverse and short-term impacts to water quality could occur during site development, especially within the Lower portion of the proposed site, because of the extent of soil disturbance. Turbidity and sedimentation could be temporarily

increased during the period when the Lower site is graded, internal roadways are built, and limited utility trenching occurs.

Effective best management practices (BMPs) would significantly minimize the extent of impacts on the adjacent water bodies and wetland areas. The impacts from stormwater runoff on the water quality during normal operation of the project would be minimal . After site preparation, a comprehensive storm water treatment system would be implemented that reduced high runoff rates and related adverse impacts, such as a reduction of streambed erosion and subsequent sedimentation. Effective treatment units would remove at least 80% to 90% of the suspended solids and virtually all floatables and entrained oil and grease.

While even the best treatment system cannot eliminate all impacts from residual peak runoff rates and pollutants contained in the storm water discharge, the removal rates of the proposed drainage system would drastically improve the existing runoff conditions relative to the pre-construction conditions. With implementing the proposed mitigations under the SEIS Preferred Alternative, adverse quantity and quality of storm water impacts would be reduced to less-than-significant levels.

Water impacts from onsite wastewater treatment: Significant adverse impacts from on-site wastewater treatment could occur when untreated wastewater or wastewater effluent with none or only partial treatment would reach surface water or groundwater water or otherwise affects natural or human resources. The project site is not connected to the municipal sewer system and therefore on-site wastewater treatment is required to accomplish the degree of treatment that is necessary to reduce significant impacts to less-than-significant levels.

For both SEIS alternatives, there would be two types of on-site wastewater treatment systems at the proposed site: (1) conventional septic systems and (2) advanced wastewater treatment. A conventional septic system comprises one septic tank and one leach field, to treat wastewater. This system of treatment is effective for the Upper portion of the project site because of its relatively large horizontal and vertical distance between point-of-injection and the receiving water bodies and the thick layers of unsaturated soil. These large vertical and horizontal distances reduce impacts. In the Upper site there are presently eight conventional septic systems, which are connected to warehouse buildings.

Since the Lower portion of the project site is closer to environmentally sensitive areas and would result in situations where the point-of-injection would be close to water bodies or saturated soil layers, an advanced wastewater technology has been selected that has higher removal rates than conventional septic systems. Therefore, the on-site wastewater treatment for the Lower portion of the site would use more effective wastewater treatment than conventional septic systems, including aeration, filtering, and adsorption processes. These mitigation measures would reduce wastewater related impacts to less-than-significant.

Furthermore, the EPA has released guidelines which suggest the expected (average) treatment efficiency of the selected advanced onsite wastewater systems to be higher than conventional

central wastewater plants. Therefore, on regional level, impacts of advanced on-site wastewater systems would be lower than wastewater treatment in a central wastewater treatment plant.

Water and Energy use: Construction and operation of the proposed project would result in use and consumption of energy and water. Trenching for below ground utility installation could result in significant impacts through fugitive dust and some quantity of stormwater runoff containing elevated TSS. But the proposed mitigation measures would significantly reduce any such impacts to less-than-significant levels.

Upon completion of the proposed project and under the low impact site development approach of the SEIS Preferred Alternative, energy and water consumption would be reduced relative to conventional warehouse designs.

The Applicants have installed a significant capacity of onsite renewable energy generation in the Upper portion off the project site. This presently supplies a considerable part of the project's electricity needs, thus decreasing the supply of energy needed from the island-wide electricity grid. Because of permitting issues, it is not known how much more renewable energies the Applicants can add to the warehouse development in the future. But the Applicants would be willing to invest more in onsite renewable energy production.

The proposed project would implement significant water saving in comparison to conventional warehouses. Therefore, the water consumption at the proposed site would decrease relative to other warehouse developments which do not use sustainable development strategies with water conservation measures. The amount of increased water use that would result from the additional floor space developed under the Proposed Action would therefore be less than conventional warehouse designs would require.

Waste, by-products, and hazardous materials: Unintentional or accidental release of waste, by-products and hazardous materials could cause significant adverse impacts. With a comprehensive plan to avoid dangerous spills and without the need to store and handle significant volumes of such agents on the construction site, the associated impacts could be reduced to less-than-significant. Similarly, the generation of solid waste, such as construction and demolition waste, plastics, cardboard, paper, metal, wood, and other inorganic solid waste, could cause significant adverse impacts at the site if not properly mitigated. The planned mitigation measures would manage solid waste in such a manner that impacts will be reduced to less-than-significant levels.

A construction waste management program would part of the sustainable design approach of the Proposed Action. Construction and demolition debris that cannot be either reused or recycled would be diverted to permitted solid waste facilities on Oahu. The use of landfill area and volume for the deposit of waste represents an island-wide impact that cannot be avoided. The traffic impacts from removing waste from the site could be mitigated through scheduling the resulting heavy truck traffic in times of off-peak hours to less-than-significant levels.

A comprehensive recycling and waste management program would be implemented during operation of the light industrial park. This would lower the risk of uncontrolled disposal of solid waste at the site. Special care would be exercised by the park operator that no litter and waste was discarded on the adjacent land, especially in the adjacent Kapa'a Stream corridor or the adjacent Kawainui Marsh. Furthermore, during operation, any hazardous material and byproduct as well as solid waste which cannot be recycled would be collected and properly disposed of at active and permitted facilities.

The uncontrolled discharge of stormwater associated with industrial activities could be a significant adverse impact. The Applicants have obtained NPDES No Exposure certifications for the existing warehouses. The no exposure certifications certify that the facilities covered under the certification have implemented strict source control rules for storm water pollution prevention. For the new developments under both SEIS alternatives, new no exposure certifications would be obtained. This would implement good source control and significantly Lower adverse impacts.

Visual Impact: The development of the light industrial park would cause aesthetic impacts, especially early in the project when the site would be exposed to observers until the vegetation in the vegetative buffer zones around the site perimeters was established and created a dense screen. This short-term visual impact would be an unavoidable impact that all developments face when new landscaping replaces older vegetation.

After reestablishing the vegetation at the site perimeter, the visual impact of the warehouse structures and roadways within the proposed site would be mitigated and only a small visual impact would remain from distant and possibly adjacent view planes. This would reduce impact to less-than-significant levels. A certain degree of visual impact from short sections of adjacent H-3 Freeway might remain unavoidable, even with the proposed extensive visual impact mitigation. A recent site visit, however, has revealed that vegetation along the H3-freeway sections that are adjacent to the project site have grown into a dense cover screen since the 2011 FEIS was approved.

<u>Appendix G describes visual impacts measures which have shown efficacy in addition to establishing a vegetation screen around the Lower site. These measures would include applying certain color schemes to the façades of the buildings in the Lower site. Experience with using color schemes for visual impact mitigation have shown that appropriate color helps blending building into the surrounding environment.</u>

Public Safety: Construction activities would result in some degree of unavoidable potential impact regarding public safety, due to transport of construction material to and from the proposed site. The level of risk could be lowered if construction related traffic was scheduled to arrive or depart the site during off-peak hours. Appropriate mitigation such as traffic controls during the movement of large loads on the road would help to Lower the risks.

Socioeconomics: The construction and operation of the proposed light industrial park would affect population, housing, employment, and public services in the Koolau Poko region. Since the main construction activities are associated with site preparation, which would occur during a relatively

short period of the entire project, it is unlikely that a significant number of construction workers would move to the region to reside there permanently. Once site preparation is complete, subsequent construction of the warehouses themselves would represent less construction activity and would be spread over a longer time frame. Therefore, impacts from construction workers moving into the region are expected to be minimal.

During operation of the light industrial park, it is anticipated that at least 600 full time employees would find work in the newly developed light industrial park in addition to the present employment level. It is expected that a small portion of these new employees would move to the region, thereby directly affecting housing and public services. There are two aspects that would limit the impacts from new employees moving into the region. First, the possible influx of new employees, some with families, would occur over a period of about 15 to 17 years. Thereby the local housing market and public services will have adequate time to adjust to new residents. Second, it is predicted that the population in the Koolau Poko region will decline slightly over that time frame due to relocations, deaths, etc.

Health and safety of work force: A potential for injuries or fatalities to construction workers and employees during operation of the proposed project are unavoidable occurrences. Even the best safety programs and best management practices would limit, yet not eliminate, potential injuries or fatalities. Consequently, an increase in traffic volume, either the increased traffic volume generated by the proposed project or the background traffic that is predicted to grow independently of the proposed project, would typically result in a higher number of traffic incidents.

7.4 Summary of Mitigation Measures to Lower Significant Adverse Impacts

Section 6.4 of the 2011 FEIS described mitigation measures that were suggested to reduce most impacts identified to less-than-significant levels. Table 7.4.1 describes these mitigation measures as well as impacts that cannot be mitigated below a less-than-significant level, even with mitigation measures, thus rendering these impacts "unavoidable".

The significant impacts are similar between the two SEIS alternatives. The SEIS Preferred Alternative would have a broader range and more effective mitigation measures than the SEIS No-action alternative. Table 7.4.1 only describes mitigation measures under the SEIS Preferred Alternative.

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
Soil A total of about 27 acres of soil area would be directly affected from the demolition and construction through grading, excavation, placement of fill, mixing, and	Prior to construction, a sediment and erosion control plan would be developed in accordance with local ordinances and the further goals of the sustainable design approach of the project.	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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soil augmentation. The resulting impacts would be loss of topsoil, fugitive dust, soil erosion, entrainment and runoff and sedimentation. Further impacts would include compaction of soil and resulting disturbance of soil structure, increasing risk of erosion.	The sediment and erosion control plan would include BMPs to control runoff erosion and sedimentation. BMPs could be generic and site-specific; examples of mitigation measures are protective devices to control drainage flow, erosion control matting, riprap, sedimentation traps and temporary and permanent reseeding. The proposed mitigation measures are discussed in more detail in Chapter 4 of this SEIS document.	
Traffic Impact before the midpoint of the project development is reached. The traffic volume on adjacent roads and intersections that are affected by the Proposed Action would increase, thereby. impacting the traffic conditions. The level of service (LOS), however, would stay better than D and E for affected roadway sections and intersections, respectively.	Based on the TIAR used in the 2011 FEIS process, no traffic impact mitigation measures would be required by midpoint of development to keep LOS above the critical threshold. This would signify a satisfactory condition. A revised TIAR will be developed after the final building density at the project site has been confirmed by the Accepting Agency.	**LTS** (without mitigation)
Traffic Impact at full build-out of the project The prediction of traffic volume at full build-out used in the 2011 FEIS review indicated that there would be significant impacts on (at least) three intersections that are affected by the project. Based on the TIAR used in the 2011 FEIS, the predicted LOS without mitigation would reach E and F, a significant impact.	Based on the TIAR used in the 2011 FEIS process, some traffic impact mitigation measures were required at full buildout development to keep LOS above the critical threshold to avoid an unsatisfactory condition. A revised TIAR will be developed after the final building density at the project site has been confirmed by the Accepting Agency.	**LTS**
Traffic impact from the relocated 4 kV power line:	The poles would be located as far away from the roadway, depending on the	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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Depending on the alternative alignment of the relocated 4 kV power line chosen, there could be impact from new poles on the traffic because of the proximity of the poles to the roadway.	available shoulder alongside the Kapa'a Quarry Road.	
Air quality impacts during construction Possible significant impacts to air quality would be possible during construction if these impacts were not mitigated. Specifically, fugitive dust and emission from tail pipe emissions would need mitigation.	Mitigation measures would follow good operational practices. With these mitigation measures in place, the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Air quality impacts during operation Possible significant impacts to air quality could occur during operation, if not effectively mitigated. Specifically, emission from tail pipe emissions and the use of products containing VOCs should be mitigated.	Mitigation efforts would be directed to Lower tail pipe emissions, especially from heavy trucks and other diesel fuel powered equipment that can discharge quantities of particulate matter. With these mitigation measures in place, the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Noise during construction Possible significant impacts due to noise can occur during construction, if not mitigated. There are two phases in the construction that create different types of noise, the site preparation work and the construction of individual warehouses.	Mitigation efforts during site preparation would be mainly to reduce noise from heavy machinery and trucks. With these mitigation measures in place the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Noise during operations Possible significant noise impacts could occur during operation, if not mitigated.	Mitigation efforts during operation would include measures to attenuate noise levels from traffic and noise from machinery used in the business operations of companies in the park. With these mitigation measures in place,	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
	LTS=Less than significant ; UAI = unavoidable impact	
	the impacts would be reduced to less-than-significant levels. Mitigation measures are described in Chapter 4 of this SEIS document.	
Native Vegetation/Wildlife Habitats at the project site: short-term impacts The existing vegetation at the site perimeter would be cleared to make space for the restored habitat at the site perimeter. This would result in an unavoidable short-term impact reducing wildlife habitat.	Since the significant impact is a result of clearing vegetation at the site perimeter, which is necessary to install the higher and wider earth berms and vegetative buffer zones, this clearing cannot be avoided. The existing vegetation at the site perimeter consists mostly of invasive plant species. The new vegetated buffer zones would replace the old and existing vegetation of invasive plants with native and adapted plant species. These plants would offer a higher quality of vegetation cover and wildlife habitat than the existing, mostly invasive vegetation on the project site.	**UAI**
Impacts to endangered species Significant Impacts could arise when endangered water birds were attracted to open water ponds in the proposed park. The adjacent Kawainui marsh is home to four federally listed water birds and any impact must be mitigated. <u>The addition of new power lines in proximity of Kawainui Marsh could create a risk of birds striking the power cables.</u>	Mitigation measures would be implemented to avoid attraction of water birds. The most effective mitigation would be to place the storm water detention and rainwater catchment volumes underground. These mitigation measures would be implemented under both SEIS alternatives. With these mitigation measures in place, the impacts will be reduced to less-than-significant levels. <u>Impact mitigation measures against bird collisions against power line would be to place colored visual marker balls on the lines.</u>	**LTS**
Light pollution	The light pollution mitigation strategy of the proposed project is part of and is	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
Light pollution could adversely affect natural and human resources and could represent a significant adverse impact on the environment and community. The proposed site is adjacent to the important Kawainui Marsh. This location requires effective impact mitigation measures.	delineated in the sustainable design approach. A comprehensive light pollution mitigation strategy was submitted to and approved by the Accepting Agency. (SDC, 2016) The mitigation measures would include lowering the lighting density and light trespassing for interior and exterior light sources. With these mitigation measures in place the impacts would be reduced to less-than-significant levels. Mitigation measures are described in Chapter 4 of this SEIS document.	
Land Use – conversion to impervious land The conversion of approximately 27 acres from pervious land to impervious land, through construction of impervious roadways and building rooftops, would be a significant impact. This impact is an unavoidable impact, which is lessened by low impact development storm water strategy of the project.	The conversion of land use from pervious to impervious land cannot be completely mitigated. The conversion of land to imperviousness is an explicit act to change the perviousness of a significant area. Therefore, it is an unavoidable impact. However, since the project site is a former landfill, sealing the surface and reducing water infiltration into the landfill body and therefore reducing the amount of leachate can have positive environmental benefits.	**UAI**
Water Quality impacts from stormwater runoff during construction Significant impacts from storm water runoff could occur during construction through soil exposure, increased risk of soil erosion, entrainment, and transport to water bodies. The presence of important and environmentally sensitive aquatic habitats	Mitigation measures would include best management practices (BMPs) which reduce erosion, entrainment of soil in water drainage from the site, and subsequent release of entrained soil to the water bodies. With these mitigation measures in place, the impacts would be reduced to less-than-significant levels.	LTS

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
downstream of the proposed site emphasizes the importance of mitigating these significant impacts.		
Water Quality impacts from stormwater runoff during operation Significant impacts from stormwater runoff can occur during operation of the industrial park. Changing pervious to impervious land increases the runoff flow rates and result in streambed erosion and subsequent sedimentation. Soil, debris, and hazardous material could be entrained in the runoff and enter the natural environment. The presence of important and environmentally sensitive aquatic habitats downstream of the proposed site emphasizes the importance to mitigate these significant impacts.	The Proposed Action would have a comprehensive system to manage storm water impacts. High runoff rates would be reduced by temporarily detaining the stormwater on the site and releasing the water at a Lower flow rate after the storm event. Part of the stormwater would be collected and used together with harvested rainwater from rooftops for irrigation. Pollutants in the stormwater would be removed to a high degree through an integrated treatment system. Soil erosion would be reduced through stabilization of the soil and extensive vegetation cover. With these mitigation measures in place, the impacts would be reduced to less-than-significant levels.	**LTS**
Water impacts from onsite wastewater treatment Significant adverse impacts could occur if wastewater is released to the environment without receiving a satisfactory degree of treatment to remove organic matter, nutrients, harmful bacteria, and other harmful agents. The project site is not connected to the municipal sewage system and therefore an effective on-site treatment system must be installed to mitigate any significant impacts. The water bodies and aquatic habitats that are adjacent to the site are susceptible to discharge of polluted water and require a	The Proposed Action would have a comprehensive system of wastewater treatment that treated wastewater to a satisfactory level so that it can be released to the environment without resulting in significant impacts: • The Upper portion of the site has horizontal and vertical distances to the receiving waters which are favorable for the installation of a series of conventional septic systems. The Applicants are in the process of replacing the septic systems in the Upper site through advanced wastewater treatment systems. All	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
	LTS=Less than significant ; UAI = unavoidable impact	
thorough and comprehensive treatment of wastewater generated on the site.	new warehouses build in the Upper site would use advanced wastewater treatment in lieu of conventional septic systems. • The Lower portion of the project site is immediately adjacent to sensitive water bodies and wetland areas. This and other site conditions require the use of more advanced treatment processes than conventional septic systems. Consequently, wastewater systems would use aerobic, filtration and adsorption processes, therefore significantly increasing the removal rates of organic matter, nutrients, suspended matter, and bacteria. The effluent of the advanced wastewater treatment would be used for below-ground irrigation and infiltration in a leach field. The mitigation measures would reduce the significant impacts to less-than-significant levels.	
Increased electricity and water use The addition of a significant amount of floor space would affect energy and water demand and cause local and regional impacts. Effective energy and water saving measures would be used to mitigate the impacts.	The addition of approximately 500,000 additional sqft of leasable floor space would result in an increase in energy and potable water demand at the project site. The low impact development approach for the proposed project would implement effective measures to save electricity and water. The proposed project would implement energy savings technologies to Lower the electricity demand by approximately 30%	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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	below the level of conventional warehouses. The Applicants have started to install a sizable capacity of on-site renewable energy (photovoltaic panels) on existing warehouses to provide a portion of the demand. The Proposed Action would decrease the water demand in the buildings by at least 30% using water saving fixtures. The proposed project would significantly reduce potable water for irrigation using recycled wastewater or harvested rainwater for irrigation. As a result, the project could reduce the impacts resulting from higher demand to less-than-significant levels.	
Solid waste and hazardous material during construction Significant impacts could occur when solid waste and hazardous material are released into the environment. Effective disposal and control measures are required to mitigate any resulting impacts.	A comprehensive waste management program would be implemented during construction to significantly reduce construction and demolition debris through recycling and reuse. It would be an unavoidable impact that the remaining construction debris was transported to active landfills, thereby creating impact on the use of landfills. Any unintentional and accidental spills or release of hazardous material would be reduced by implementing best management procedures. Hazardous waste material would be collected and properly disposed of at active facilities that are permitted to receive such waste.	**UAI**
Waste, byproducts, and hazardous material during operation Significant impacts occur when solid waste, production byproducts and hazardous material are released into the environment.	Recyclable material will be collected by means of a recycling system. The rest of the waste and production byproducts waste will be disposed of in active landfills. Hazardous waste material would	**UAI**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
Effective disposal and control measures are required to mitigate any resulting impacts.	be collected and properly disposed of at active facilities that are permitted to receive such waste. It is an unavoidable impact that landfill capacity would be used for waste disposal.	
Visual Impact during construction The presence of the Proposed Action would cause significant aesthetic impacts during construction, when the existing vegetation at the site perimeter of the Lower portion of the site is removed, thereby exposing the site to observers on the quarry road.	During construction, the Lower portion of the site would create more visual impacts than the Upper portion since the Upper portion is farther away from the Kapa'a Quarry Road and hidden behind an effective screen of high trees. At present the Lower portion of the proposed site is surrounded by a simple vegetated buffer zones along the site perimeter, which is adjacent to the Kapa'a Quarry Road and the Kapa'a Quarry Place. For the construction of the permanent and improved vegetated buffer at these locations, the existing invasive vegetation would be removed. This would expose the Lower portion of the site to direct views , especially to motorists who pass the site on the Kapa'a Quarry Road. Therefore, this short-term visual impact could be considered unavoidable.	**UAI**
Visual Impact during operation The presence of the proposed light industrial park could cause aesthetic impacts during operation. The addition of a significant number of warehouses would be noticeable from near and distant view plane and requires comprehensive mitigation.	Trees would be added to the existing screen of tall trees at the eastern boundary of the Upper portion of the site. This would reduce any remaining visual impact from near and distant views. A new vegetative buffer zone, with taller trees and higher earth berms than in the existing buffer zone, would be constructed around the Lower portion of	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
	the site. A comprehensive visual impact analysis in Chapter 6 of this SEIS document shows that visual impacts could be mitigated to less-than-significant levels for most of the near and distant view planes.	
Public safety during construction Construction related to the project would result in some impacts on public safety, which cannot be avoided.	Even with mitigating measures such as traffic controls and scheduling of transport to and from the site, some degree of impact would remain and is therefore unavoidable.	**UAI**
Health and safety of workforce Injuries and fatalities to construction workers and employees of companies in the completed park cannot be completely mitigated and could cause adverse impact.	The Applicants would use best safety programs and best management practices to limit any health and safety risks. However, the potential for injuries or fatalities can never be completely eliminated. Therefore, some degree of impact would remain and would therefore be unavoidable. The nature of the proposed light industrial park, however, does not include industries that might have a higher accident level.	**UAI**
Socio-economic Though unlikely, an influx of employees to the Koolau Poko region could cause significant impact to public services and housing in the region.	Only a small number of the estimated approximately 600 new employees would relocate to the Koolau Poko region and would therefore create only small additional demand on public services and housing as the project is phasing in over several years. Since the population in the Koolau Poko region is likely declining slightly over the next 15 years, the net result of the immigration and the declining population would reduce the impacts to less-than-significant levels.	**LTS**

7.5 Justification for Proceeding with the Project Despite Selected Unavoidable Impacts

Section 6.5 of the 2011 FEIS described the justification for proceeding with the project despite selected unavoidable impacts. Despite the unavoidable impacts disclosed above, the Proposed Action should be implemented because potentially adverse impacts would be localized, temporary and mitigated to less-than-significant levels. The type and scope of consequences of unavoidable impacts identified for this project are not of such significance that they would warrant interruption of the Proposed Action.

But some impacts could not be entirely mitigated. The visual impact mitigation, for example, would reduce the adverse visual impact for most of the near and distant views, but one remaining view on the proposed project from the H3-freeway could not be completely mitigated and remains unavoidable. The traffic impact would be another important impact that is important to the public, but which could only be mitigated to the extent possible. While most traffic impact from cars and light trucks could be readily mitigated, heavy truck traffic is a special case that would require extensive mitigation measures to reduce impacts below significant levels.

The proposed project would offset the level of impacts that remain after comprehensive mitigation measures with the following benefits:

- Economic and sustainability benefits would occur from construction and operation of modern, energy efficient and environmentally friendly facilities that reduce landfill-related leachate to environmentally sensitive areas.
- Continuation of well-planned build-out of needed small service businesses that match the needs of the market and local community.
- Opportunities for windward companies close to the place of residence of owners and employees, within the Koolau Poko region.
- A way to ensure light industrial facilities which are built on sustainable development principles, and responsible use of resources, assets that will be indispensable in a future sustainable Hawaii.
- Completion of redevelopment of a former landfill area to offer small service and light industrial space in the region, thereby providing an opportunity for older industrial zoned older facilities to relocate from land that can be use more beneficially for the community, such as single-family housing or commercial space that follows the Koolau Poko sustainable communities plan.

7.6 Cumulative Impacts

Section 6.6 of the 2011 FEIS described cumulative impacts related to the proposed action. In accordance with environmental guidelines and regulations, cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions ..." (40 CFR 1508).

The cumulative impact analysis for the Proposed Action evaluates the following aspects of the analysis:

- **Transportation infrastructure in the area:** The proposed project would increase traffic on adjacent roadways and intersection, resulting in impacts on the environment (air quality, noise effect of

wildlife, wildlife collision, etc.) and the community (potential reduction in level-of-service, increased congestion, increased incidences of accidents)

- **Water quality:** The proposed project would affect the water quality through activities during construction and operation; water quality would be affected through stormwater runoff, and positively impacted by onsite treatment of wastewater.
- **Visual impact:** The proposed project would add a significant number of structures and would affect the aesthetic condition at the site temporarily.

Geographic Region - where impacts have significant effect or consequences:

- Areas close to the proposed project site: The most direct impacts of the Proposed Action would be near the project site, which is in the Lower part of the Kapa'a Valley. Since the valley boundaries also delineate the watershed boundaries, related consequences include the entire Kapa'a watershed.
- Regional area: The regional area that is most significantly affected by cumulative impacts is the Kawainui Marsh and the Kailua town. Some types of impacts affect the environment and community on a larger geographic scope and might include island-wide consequences.

Time Horizon: Establishing the time frame in which impacts must be considered:

- **Past actions:** The appropriate time frame for past actions is about 15 years ago, when the rate of growth of new warehouses in the Upper portion of the project site started to accelerate. Other activities that precede these past actions are also considered.
- **Present actions:** Present actions describe pertinent impacts as they are active at the present.
- **Reasonably foreseeable future actions:** Future actions are those that can be assumed to happen within the next 10 years.

How this Proposed Action relates concerning Hawaii's future and natural and human resources:

- Hawaii's important move towards more sustainable resource consumption: The need for Hawaii to align its future visions and developments towards more sustainability has never been greater. While there have been numerous initiatives to move Hawaii towards sustainability over the past 30 years, some notable recent initiatives underline the urgency to commit to sustainable development principles. These two recent sustainability initiatives are the Hawaii Clean Energy Initiative and the Hawaii 2050 Sustainability Plan. The proposed project would contribute to achieving some goals of these important initiatives.
- By using low impact development strategies, the proposed project would contribute to the goals of the Hawaii 2050 Sustainability Plan, since the Proposed Action will ensure natural resources are used responsibly and respectfully. By operating the light industrial park in a sustainable fashion, the Proposed Action would be one prototype of making sustainability a part of our daily practice doing business in Hawaii.
- The Hawaii Clean Energy Program emphasizes the need to provide up to 70% of the predicted energy needs of Hawaii in the year 2030 with clean energy technologies, which means through renewable energies and energy conservation. Developments with significant long-term investments, such as the proposed project, should significantly reduce energy and water use,

increase the amount of electricity generated by renewable technologies, and reduce transportation fuel to the extent possible, by bringing the location of employment, commerce, and recreation closer to the consumer and resident.

- The Proposed Action would contribute to such goals by providing the residents of Koolau Poko with employment opportunities and services by companies that can find industrially zoned space within the region, reducing the carbon footprint and unnecessary commutes of employees, owners, and customers/clients.

Tables 7.6.1 through 7.6.3 present a description of significant cumulative impacts on the transportation infrastructure of the area, on water quality as well as on the aesthetic appearance. The discussion of cumulative impacts in Tables 7.6.1 through 7.6.3 correlates geographic scope and time frame for every significant cumulative impact

Cumulative impacts on the transportation infrastructure in the area: Adverse impacts of increased traffic volume could result in decrease of level-of-service, thus increases in congestions, incidences of traffic accidents, and wear and tear on the road infrastructure.

Associated impacts from traffic are adverse effects to air-quality, noise, wildlife, and runoff from roadways.

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
Transportation Infrastructure Description	Affected areas or environment: Kapa'a Quarry Road and Kapa'a Quarry Access Road, 3 intersections of the Kapa'a Quarry Road with (1) Kalanianaole Hwy. (2) Mokapu Blvd. (3) Kapa'a Quarry Place	Affected areas or environment: On a regional level the Kapa'a Quarry Road is used by windward residents to connect between Mokapu Blvd. and Kalanianaole Hwy. This traffic volume represents the background traffic that must be considered to assess the future traffic volume.
Past Actions	The local sources of traffic (within the Kapa'a valley) have been as follows: • The older warehouse development on the project site started approximately 30 years ago and has grown in a phased manner to its present size. These facilities generate heavy-truck and light vehicle traffic. • The quarry, further West in the Kapa'a Valley, under various past owners, has been mining rock and producing ready-mix concrete. These facilities generate mostly heavy-truck traffic. • The former landfill generated heavy-truck traffic volume until its closure in the 1980s. • The Kapa'a Refuse Transfer Station transfers waste from locally operating garbage collection to trucks for the	In the past, the background traffic has been increasing on the quarry road. • The route over the Kapa'a Quarry Road can avoid some congested roads in Kailua. • Developments that have directly affected the traffic on the Kapa'a Quarry Road in the past decade include the Le Jardin Campus at the south end of the Kapa'a Quarry Road and the construction of a small number of natural habitat developments and trails by community groups along the marsh side of the Kapa'a Quarry Road.

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
	transport of the waste to active leeward landfill and waste incineration facility; the facility generates heavy-truck, car, and light truck traffic. • The Kapa'a Refuse Transfer Station also serves the residents, who can drop quantities of domestic waste and recyclable waste; heavy-trucks and vehicles and light trucks. • The model airplane park, adjacent to the East of the project site is a popular recreational destination; This facilities generates only vehicle or light truck traffic.	
Present Actions	The local sources of traffic (within the Kapa'a valley) have been as follows: • The warehouse development on the project site has been growing and the facilities generate higher heavy-truck and vehicle traffic rates. • Traffic generated by the remaining land uses in the Kapa'a valley includes the quarry, refuse transfer station and model Airplane Park. These land uses have been relatively stable in the past couple of years.	The traffic situation within the affected regional areas has been growing slowly in concert with overall increasing traffic volumes on Oahu's roads. The traffic rate on the Kapa'a Quarry Road has been steady growing over the past couple of years.
Reasonably Foreseeable Future Actions	The reasonably foreseeable development of local sources of traffic (within the Kapa'a valley) have been as follows: • Based on present state of the site development the Proposed Action would add about 500,000 sqft. of warehouse footprint. This would generate an increase in	The following trends are expected to affect the volume of background on the quarry road and affected intersections: • It is expected that the background traffic on the Kapa'a Quarry Road will either grow slightly or stay constant. The Koolau Poko region is expected to have a slightly

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
	heavy truck and light vehicle traffic. The project would promote alternative modes of transportation to reduce the traffic volume. • Upon consultation with Ameron, there is no planned expansion or reduction in plant facilities and mining operations at the quarry; therefore, the traffic volume should remain stable in the foreseeable future. • Traffic generated by the Kapa'a Transfer Station is expected to remain constant for the foreseeable future. The volume and type of waste might be changing with the increase of recycling in the community, but this is not expected to change the traffic to and from the facility appreciably. • The traffic volume to the model airplane park is expected to remain constant for the foreseeable future since no known additions to the park are known at this time.	shrinking population of the next decades resulting in less traffic generated. • The increasing trend towards sustainability will somewhat reduce the individual traffic and foster alternative modes of transportation, thereby slightly Lowering traffic. • In the foreseeable future there would be the following developments along the quarry road: - Construction of the Kawainui Marsh Restoration project, a joint project of DLNR and U.S. Army Corp of Engineers started in 2011. Upon completion most of the visitors to the new park would approach the Kawainui Marsh Restoration project on the quarry road from the Kalanianaole Hwy. direction, therefore not impacting traffic volume on Northern part the Kapa'a Quarry Road, thus not close to the project site. - Possible, but not confirmed, is the development of a Hawaiian cultural and educational center in the southern section of the quarry road. This facility would generate some construction related heavy-truck traffic and vehicle traffic during operations.

Cumulative impacts on water quality: Adverse impacts to water quality would include effects from increased runoff volumes from impervious areas potentially resulting in streambed erosion and subsequent sedimentation, discharges of entrained solids and other pollutants contained in runoff to receiving water, discharges of treated wastewater that migrates to the receiving waters, and diversion of water from runoff into the receiving water thereby Lowering the water flow in streams and other water bodies.

Associated impacts from impaired water quality would cause adverse effects to aquatic resources due to an increase in organic loading, increase of eutrophication, increased toxicity from other water pollutants, reduction of aquatic habitat due to sedimentation, and reduction of functions of downstream wetland areas and water bodies for flood control and reduction in pollutants.

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Water Quality Description	Affected areas or environment: Areas include the Kapa'a Stream corridor and the drainage ditch along the Kapa'a Quarry Road directly adjacent of the project site.	Affected areas or environment: On a regional level water quality would be affected by contribution of several land uses upstream of the proposed site, and within the Kapa'a watershed. Water quality in the Kawainui Marsh is affected by the water quality in the Kapa'a Stream, which is the main drainage for the Kapa'a watershed and directly drains into the marsh.
Past Actions	The land on which the project site is located was once a wetland area that was connected to the Kawainui Marsh. Landfill developments some 60 years ago resulted in the creation of a landfill area of approximately 45 acres, consisting of mostly quarry overburden and tailings and some quantity of solid municipal waste. The landfill body is on top of indigenous soils and is not sealed by an artificial impermeable seal. A drainage ditch	The Kapa'a watershed has been significantly altered over the past decades. The watershed was once directly connected to the adjacent Kawainui Marsh until an elevated roadway was built across the Lower stretches of the watershed, thereby separating the direct drainage pathways of the watershed to the marsh. The main land use of the Kapa'a watershed remained agricultural and cattle ranching until the start of quarry and landfill

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	was constructed downstream of the site along a portion of the Kapa'a Quarry Road. This drainage ditch was supposed to function as a drainage conduit that conveys surface runoff and seepage to the Kapa'a Stream. Surface runoff and seepage from the Lower portion of the site landfill reached the Kapa'a Stream and the wetland area that formed in the lower stretches of the Kapa'a Stream corridor. After the warehouses were added and impermeable pavement was installed on parts of the Upper portion of the site, the quantity of surface runoff increased. Over the years, drainage inlets were installed that collected and conveyed runoff to the stream corridor. One small detention pond with an armored spillway was installed, which avoided scouring in the slopes at the perimeter of the Upper portion of the site. The drainage situation at the Lower portion of the site has not changed markedly over the years, and site drainage occurs through direct runoff and infiltration and subsequent seepage. Wastewater treatment has been carried out with onsite conventional septic systems.	operations. These intensive quarry and landfill activities as well as the construction of the H3-Freeway have adversely affected the Kapa'a watershed. The Kapa'a Stream has been significantly affected through changes of the stream bed to its present location and form and causing impacts due to high TSS and other water pollutants from increase runoff. The drainage system of the Kawainui Marsh was affected by the changed drainage from the watershed and the changed stream bed of Kapa'a Steam. The marsh received significant qualities of sediments that were eroded and entrained solids from the Kapa'a watershed. The Kapa'a valley has not been connected to the municipal sewer system, due to the limited quantity of wastewater produced and the fact that no gravity sewer system is available and feasible. Septic systems and cesspools have been used in the valley to treat wastewater onsite.
Present Actions	Drainage at the present site consists of: • In parcel TMK 4-2-15:014 (Upper portion of): The 4.4 acres of rezoned land has presently three new	The drainage situation in the watershed is characterized by the closure and redevelopment (some quantity of vegetation and resulting soil stabilization) of the landfill

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	warehouses with a combined footprint of approx. 60,000 sqft. These warehouses are surrounded by impervious pavement. The rest of the parcel is graded area. The runoff of land with warehouses uses LID storm water treatment and a flood basin at the Eastern boundary of the rezoned land. • In parcel TMK 4-2-15:013: Drainage from 15 acres of impermeable area occurs through several drainage catch basins and one detention pond to the Kapa'a Stream corridor. There are new warehouses built at the present time which would be drained though detention vaults, manufactured filtration devises and vegetated buffer strips. • In parcel TMK 4-2-15:014 (Lower portion): Drainage from about 19 acres of graded land occurs through runoff to the Kapa'a Stream corridor and through some infiltration into the landfill body. Some quantity of seepage flows to the drainage ditch along the quarry road. • At present there are eight conventional septic systems each with a septic tank and leach field, all within the Upper portion of the site. There are no active cesspools on the property. • Presently two advanced wastewater systems are installed in the Upper site as part of a pilot project that	areas and expansion the warehouse development at the proposed site. In its present condition the proposed project site contributes about 16% and 15% of the entire Kapa'a watershed as TSS baseload and TSS 2% event load, respectively. At present the water quality of the Kapa'a Stream is primarily affected from a high TSS content. This causes related consequences of higher turbidity also in the Kawainui Marsh. During periods of intensive storm events water levels in the stream increase and can cause the transport of sediments and other pollutants to the downstream wetland and marsh. There are a limited number of septic systems installed at the active land uses in the Kapa'a valley, which include the quarry, the transfer station, the model airplane park and the existing warehouse development. The existing septic systems are considered to result in less-than-significant cumulative impacts.

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	will proof the effectiveness of the advanced wastewater technology.	
Reasonably Foreseeable Future Actions	Under the SEIS Preferred Alternative the drainage systems will be expanded, and the quality and quantity of the stormwater runoff will be improved: In the 4.4-acre rezoned land within parcel TMK 4-2-15:014 (Upper portion): All drainage from the impervious areas (rooftops and roadways) will be collected and treated before being discharged to the Kapa'a Stream corridor. All drainage from the land will use LID storm water treatment. In parcel TMK 4-2-15:013: All drainage from the newly formed impervious areas (rooftops and roadways) will be collected and treated before being discharged to the Kapa'a Stream corridor. One existing detention pond and several drain inlets at the site perimeter will be used. A recently constructed storm water drainage system includes an underground detention vault and a manufactured treatment device (MTD). In parcel TMK 4-2-15:014 (Lower portion): All drainage from the newly formed impermeable areas (rooftops and roadways) would be collected and treated before being discharged through several detention vaults (below ground), several vegetated buffer strips and several MTDs.	In the foreseeable future, no changes in the land use are identified that would significantly alter the overall drainage condition of the watershed, except the new drainage system at the project site. The drainage system of the project site would improve the overall drainage condition in the watershed and would therefore improve the water quality in the Kapa'a Stream and the downstream marsh and wetland areas. Since the proposed site represents only a relatively small area of the entire watershed, cumulative impacts from the proposed project would be limited. An overall improvement of the water quality in the Kapa'a watershed will require a determined effort to improve the land that contributes most of the adverse impacts on the water quality, which are areas outside the project site. The Applicants are convinced that the comprehensive storm treatment and management approach, with its sustainable design elements, would represent a positive example for possible improvements in the watershed. In the foreseeable future no additional wastewater treatment systems are anticipated in the Kapa'a watershed, other

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	Rainwater from the 5 warehouse roofs would be collected and stored in below-ground cisterns for subsequent irrigation of the restored habitat at the site perimeter. Summary: The stormwater runoff quality would be improved through the installation of comprehensive treatment units that remove sediments, oil/grease, and floatable debris. Stormwater quantity would be improved by retaining stormwater in a system of rainwater harvesting and detention vaults. The volume of water seeping into the drainage ditch along the Kapa'a Quarry Road would be significantly reduced since less water would infiltrate into the impervious cover of the Lower site. The onsite wastewater systems would install several advanced treatment systems in the Upper and the Lower portions of the project site. Over time the existing conventional septic systems in the Upper site would be replaced by the advanced wastewater systems.	than those planned in conjunction with the proposed action. Therefore, with the planned onsite technologies outlined for the proposed site, cumulative impacts from the discharge of treated wastewater in the watershed will remain at less-than significant levels.

Cumulative impacts on the visual impacts: Effects on the aesthetics of the area around the proposed site, observed from near and distant view planes, are due to the presence of various industrial structure in the Kapa'a Valley. The Kapa'a Valley has an open space appearance, although at present, there are several industrial facilities in the valley. The impacts on aesthetics are not clearly quantifiable, because of their subjective nature to the observer.

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Visual Appearance Description	**Affected areas or environment:** View planes in the immediate vicinity are from the Kapa'a Quarry Road, Kapa'a Quarry place and the model airplane park.	**Affected areas or environment:** More distant view planes on the project site are from the H3- Freeway, the Mokapu Boulevard, The Kailua Road as well selected public places or parks around the Kawainui Marsh.
Past Actions	• Before the start of quarry and landfill operation in the Kapa'a Valley, approx. 60 years ago, the proposed site was a pasture and forested land and with continuous vegetation cover. • After the quarry and landfill operation commenced the views of the site changed to exposed soil and landfill. • Around the mid-1970s the landfill activities stopped at the project site. The Upper portion of the site remained an area of graded soil surface with intermittent vegetation. The Lower portion of the site was not in use and invasive vegetation covered the surface of the landfill. • Starting in the 1990, the existing warehouse development expanded in the Upper portion of the project site with vegetation present only at the site	During quarry and landfill operations, the distant views of the valley from Kailua and the adjacent roads were characterized by large portions of exposed rock and soil. The quarry operation at the top of the valley was visible including tall process equipment. The project site had views of exposed soil but the view on the proposed site was somewhat less pronounced in comparison with the exposed area on the flanks of the mountains and hills surrounding the Kapa'a valley. After the completion of the landfill operations the land was replanted at the exposed hills and at the Lower portion of the project site. The restored landfill areas started to blend into the surrounding vegetation of the valley. During the late 1990s and early 2000s, the industrial development in the Upper portion of the project site expanded slowly, while the site remained graded but

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Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	perimeter. At the eastern boundary of the Upper portion, a row of taller trees was added to shield the view on the Upper portion and create a wind break for the prevailing trade winds. The Lower portion of the site was used for green waste processing and was surrounded by a narrow screen of vegetation that shielded views.	without vegetation. During the same time, the Lower portion of the project site was used for green waste processing. This resulted in a varying extent of vegetation in the Lower portion. Vegetation was cleared on parts of the Lower portion of the site that were used for green-waste processing. The construction of the refuse transfer station added one landmark that could be observed from adjacent as well as distant view planes.
Present Actions	The appearance of the project site has not changed significantly over the past several years. Within the Upper portion of the site more warehouses are added to the development within a compact portion of the site, thereby not altering the characteristic view of this industrial development from the Kapa'a Quarry Place roadway. The warehouse structures and other installations of the Upper portion of the site are visible from the Kapa'a Quarry Place roadway and from a short stretch on the H3-Freeway, through breaks in the otherwise dense buffer zone on the Southern side of the H3-Freeway. The Lower portion of the project site has only vegetation at the site perimeter which hides views from the Kapa'a Quarry Road and Kapa'a Quarry Place by a perimeter buffer of smaller trees and shrubs and an approximately 5- to 15-foot-high earth berm.	The distant views of the Kapa'a valley have not noticeably changed over the past years, except for the appearance of the Lower portion of the proposed site.

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Reasonably Foreseeable Future Actions	The adjacent views of the project site will be improved by the addition of vegetation at the perimeter facing the quarry road and quarry access road. • The existing tree line at the Eastern boundary of the Upper portion would be expanded with several new trees to mitigate the remaining long distant visual impacts resulting from the warehouses. • The existing buffer zone around the Lower portion of the site would be modified by increasing the height and widths of the earth berms and planting them with native and adaptive shrubs and higher trees. This new buffer would reduce the near visual impacts of the new development in the Lower portion of the project site to a less-than-significant levels.	For the foreseeable future the distance views of the Kapa'a valley would not change significantly and the Kapa'a Valley would remain characterize by open space and vegetated hill sides. • The visual impacts from the quarry and the refuse transfer station would remain unchanged. • There are no indications about using parts of the valley in the foreseeable future as a new landfill. Therefore, the vegetation cover on the Southern side of the valley should remain unchanged. • The development of the Upper portion of the project site would be entirely hidden by the added line of trees at the Eastern perimeter of the Upper site. • The Lower portion of the project site would have several structures interwoven with roadways, parking areas and some limited vegetation surrounding the warehouses. • The visual impact assessment in Section 6.6 of this SEIS document indicates that practically all distant view would be mitigated by the added vegetation at the site perimeter. <u>In addition, the use of appropriate color schemes to be applied to the facades of buildings would be used to reduce long-distance view impacts. The only view that could not be fully mitigated is the distant view from a short section of the H3- Freeway. Over the past</u>

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
		couple of years the vegetated buffer on the Southern side of the roadway has been growing denser and larger. This contributes to blocking of views on the project site and is therefore a beneficial visual impact mitigation.

7.7 Unresolved Issues in the 2011 FEIS and Actions Taken or Proposed

Section 6.7 of the 2011 FEIS described several unresolved issues at the time the 2011 FEIS was approved. Table 7.7.1 itemizes the unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
1	**Updating the Project Masterplan**	
	The site development concepts described in the 2011 FEIS needed to be defined in more details in the following process for the zone change and the SMP. The 2011 FEIS mentioned the following main task to be completed:	
1.A	Updating the layout of the proposed light industrial park:	**Completed**
	The updated site development plan needed to delineate all pertinent information about sizes and locations of structures, roads, off-street parking, drainage system, gray water/harvest rainwater systems, utilities, onsite wastewater treatment systems with leach fields/ subsurface irrigation, landscaped area, and restored habitat.	An updated site development plan was completed and is presented in this SEIS document. The updated site development plan includes design updates on storm water systems, wastewater systems, finish grade and site perimeter berms, new road access as well as several other design updates.
1.B	Updating the drainage system:	**Completed**
	The updated drainage system needed to outline all low impact development technologies that were mentioned in the 2011 FEIS and produce technical drawings and calculations so that system components such as runoff conveyance using pipes, culverts, swales, and overflow discharge as well as all process vessels could be configured.	Site drainage plans were updated. Drainage design concepts which were previously approved could no longer be implemented, because of certain technical site development issues revealed in recent engineering investigations. The updated drainage implements LID technologies and require increased finish grade elevation in the Lower portion of the project site to provide sufficient hydraulic head for gravity flow of storm water to the testament and detention facilities at the site perimeter.
1.C	The rainwater harvesting systems and irrigation system:	**Completed**
	The system of the rainwater harvesting, and irrigation system needed to be delineated in	Updated site irrigation plans were completed to implement the new irrigation approach of

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
	more detail, including the required capacity of the below-ground catchment basins	providing harvested rainwater for irrigation of the site perimeter berms.
1.D	Assessing of onsite renewable (photovoltaic) energy generation to be installed. The photovoltaic (PV) capacity targeted to be installed on the warehouse roof over the future years needed be assessed and delineated in the updated site development plan.	~~Not completed~~ Completed. The Applicant has determined that he would like to add as much PV capacity as needed to provide the electric energy needs of the planned development. The Applicant is presently not planning to provide energy for external uses but might reconsider to generate PV based energy to be fed into the grid if conditions by HECO change in the future.
2	**Revisions and Updates to the Traffic Impact Analysis Reports (TIAR)**	**Remaining Work**
2.A	A new TIAR needs to be carried out to incorporate the new site layout.	**Remaining to be done;** The Applicants have agreed to complete a new TIAR once the updated site development plan presented in the SEIS document is approved.
2.B	Potential improvements of intersections in accordance with new TIAR	**Remaining to be done:** The State Department of Transportation (DoT) indicated possible required improvements of intersections based on a new TIAR.
3	**Traffic conditions on Kapa'a Quarry Road:**	
	Concerns were raised about potential unsafe traffic conditions on the Kapa'a Quarry Road. Two aspects were mentioned that needed consideration to address unresolved issue:	
3.A	Needed road improvements: An assessment of traffic problems and possible mitigation should be completed.	**Completed** A traffic engineering assessment of traffic problems report was completed by the Applicants and submitted to DPP. The report pointed out physical obstacles that were close to the roadway as possible collision hazards and impediments to slight distances.
3.B	Determining responsibility for upgrades as mitigation measures: An assessment of who is	**Completed**

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
	responsible for the identified traffic mitigation measures.	A traffic agreement between the DPP and the Applicants was finalized in 2014 , which determined the scope of traffic improvements the Applicants would have to initiate and fund. The approved improvements were roadway frontage measures along the project site on the Kapa'a Quarry Place, including 8-foot sidewalks and road entrances to the project site. In communication with the City & County of Honolulu, the change from two roadway entrances to the Lower site to a single entrance has been approved. The proposed configuration of the single roadway entrance which is depicted in Section 6.9 will have to be modified depending on the results of the new TIAR.
4	**Requests for more environmental precautions**	
4.A	Water quality monitoring stations	**No action taken**
	Suggestions about water quality monitoring to be defined by agencies.	The suggestions have not been part of the design and were not permit requirements.
4.B	Total Maximum Daily Loads (TMDL)	**No action taken**
	Suggestions about Total Maximum Daily Loads (TMDL) Waste Load Allocation (WLAs) to be defined by agencies.	The suggestions have not been made part of the design and were not permit requirements. No new TMDL information have been released by agencies, and the 2007 information is still in effect. The storm water treatment efficacy would far exceed pre-construction condition.
4.C	Drainage canal along the quarry road:	**No action taken**
	Suggestions to line the drainage canal along the Kapa'a Quarry Road.	Jurisdiction of the drainage ditch along the Kapa'a Quarry Road is with the City & County of Honolulu. Several years ago, the Applicants made improvement suggestions for the

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
		drainage ditch. These suggestions were not supported by agencies and the community. New proposed modifications to the drainage ditch have been made by the Applicant (see Appendix J of this FSEIS). These modifications would improve water quality, by implementing a maintained vegetated swale, and would improve traffic safety on the Kapa'a Quarry Road by providing a new road shoulder. In addition, the proposed modifications of the area around the drainage ditch would provide space for a combined pedestrian and bicycle pathway.
5	**Rare failures of mitigation measures**	
5.A	Inability of comprehensive low impact development approach to control forces of nature.	**No action taken.** It is understood that site development using low impact development (LID) technologies could be overburden by extreme natural events, such as extreme floods or earthquakes.
5.B	Mitigation measures that are based on innovative low impact technologies (LID) and processes might prove less effective than intended since they are new and unproven.	**No action taken.** It is understood that LID technologies and practices have entered mainstream design practices. In fact, LID strategies are now part of the permitting requirements and can significantly mitigate adverse impacts.
5.C	Responsiveness of mitigation measures to changes in progress of project action implementation	**Actions taken.** The proposed mitigation measures have been designed to offer flexibility regarding adjusting to the speed of progress in the development of the Proposed Action. The storm water and wastewater treatment and management systems would use smaller units that would be installed in a flexible fashion as needed and serve the areas that are under active development. The smaller

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
		units are designed to work within a larger infrastructure system.
5.D	Dangers due to accidents, fires, human errors, faulty design or construction and people not following rules.	**Actions taken.** Though the inevitability of accidents, fires, human errors, faulty design or construction and people not following rules always exists, the Applicants are committed to responding to such rare events in the most practical and effective way. Emergency response plans and preventive strategies would be developed and maintained through cooperation of park management and tenants would be engaged to participate impacts mitigation.

CHAPTER 8 - LIST OF PERMITS AND APPROVALS

Permits and approvals that are either required or might be required, pending a decision by the Accepting Agency, are as follows:

Permit description	Permitting agency	Description
Permits related to water resources management: Stream Channel Alteration Permit Well abandonment permit	State Department of Land and Natural Resources Commission on Water Resource Management	Permit required if any stream bed or stream bank is altered in any way. The need for this permit will be determined after the design is completed. Permit might be required prior to sealing an unused well.
National Pollutant Discharge Elimination System (NPDES): Storm Water Runoff Hydrotesting Dewatering Permit	State Department of Health Clean Water Branch	Permit is required for storm water discharges from construction activities including clearing, grading and excavation activities Discharge of non-polluted hydrotesting water Discharge of dewatering effluent from construction activities.
Construction related permits. Building Permit Grading Permit City Trenching Permit	Department of Planning and Permitting City and County of Honolulu	Permits are required for the construction of any building or structure. Permit required for grading which changes drainage patterns with respect to properties abutting the construction site. Permit required for trenching any public facility
Road construction related permits: Road construction related permits. Right-of-Way Permit Street Usage Permit	Department of Transportation Services City and County of Honolulu	Permit is required for any construction activities within the City and County of Honolulu right-of-way. Permits needed for work within City and County roadways and State roadways.

Permit description	Permitting agency	Description
Noise Variance Permit	State Department of Health	Permit may be required for unusually loud construction activities or night work.
Underground Injection Control (UIC) permit	State Department of Health Safe Drinking Water Branch	Permit for injection well for sewage, industrial/commercial, or aquaculture-related wastewaters.
Individual Wastewater System (IWS)	State Department of Health Wastewater Branch	Permit required for wastewater works
Special Management Area (SMA) permit	Department of Planning and Permitting City and County of Honolulu	Major Special Management Area (SMA) permit is required for the development of the Lower portion of the proposed site
Permits for work in navigable waters of the US Section 10 Rivers and Harbors Act Section 404 of Clean Water Act	U.S. Department of the Army Corps of Engineers	Permit needed prior for any construction in, over or under navigable water of the U.S. Permit needed for discharge of dredge and/or fill material into waters of the U.S, including wetlands
Section 401 of Clean Water Act (Water Quality (401) Certification)	State Department of Health Clean Water Branch	Certification is required if seeking a Federal license or permit for activities involving the possibility of discharge into navigable waters (certification required for Section 10 and Section 404 permits)
Section 10 Endangered Species Act	United States Department of the Interior Fish and Wildlife Services	Incidental take permit may be required if aspects of the project endanger listed species

CHAPTER 9 - AGENCIES, ORGANIZATIONS AND INDIVIDUAL CONTACTED

The following agencies, organizations and individuals were contacted in the preparation of this ~~Draft~~ Final Supplemental EIS

Federal Agencies

- U.S. Army Corps of Engineers, Honolulu District
- U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
- USDA NRCS, Pacific Islands Area State Office

State Agencies

- Department of Business, Economic Development and Tourism (DBEDT)
  - DBEDT, Strategic Industries Division
  - DBEDT, Hawai'i State Energy Office
- Hawaii Department of Health (DoH)
  - DoH, Environmental Management Division
  - DoH, Wastewater Branch
  - DoH, Safe Drinking Water Branch
- Department of Land and Natural Resources (DLNR)
  - DLNR, Commission on Water Resources Management
  - DLNR, Division of Aquatic Resources
  - DLNR, Division of Forestry and Wildlife
  - DLNR, Engineering Division
  - DLNR, State Historic Preservation Division
- Office of Hawaiian Affairs
- Office of Environmental Quality Control
- Department of Transportation
- Water Resources Research Center / Environmental Center, University of Hawaii at Manoa

City and County of Honolulu Agencies

- Honolulu Fire Department

Honolulu Police Department

Department of Environmental Services

Department of Parks and Recreation

Department of Planning and Permitting

Department of Design and Construction

Board of Water Supply

Department of Transportation Services

Department of Facility Maintenance

Office of Climate Change, Sustainability, and Resiliency

Other

Senate District 24: Senator Jarrett Keohokalole

House District 49: Rep. Scot Z. Matayoshi

City Council Member: Ikaika Anderson

Oahu Metropolitan Planning Organization

Hawaiian Telcom

Hawaiian Electric Company

Kailua Neighborhood Board No. 31

Lani-Kailua Outdoor Circle

Hawaii's Thousand Friends

Charles Prentiss, Ph.D.

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Phyllis C. Horner, PhD, Senior Consultant
Certifications: WELL AP
Sustainable Design & Consulting LLC

REFERENCES

The Final Environmental Impact Statement (FEIS) for Kapa'a Light Industrial Park, Tax Map Key 4-2-15: 1 (por.), 6 and 8, Koolaupoko, Oahu, can be downloaded at the following link:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2011-10-23-OA-FEIS-Acceptance-Kapaa-Light-Industrial-Park.pdf

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APPENDICES

List of 12 appendices to this FSEIS document. With the exception of Appendix A all appendices are new.

APPENDIX A: SCOPING REPORT (WAS ALREADY PART OF THE DRAFT SEIS)

APPENDIX B: RESPONSES TO COMMENTS (NEW APPENDIX)

APPENDIX C: DESIGN CHANGES TO THE STORMWATER SYSTEM (NEW APPENDIX)

APPENDIX D: RELATIONSHIP OF FINISH GRADE AND STORM WATER SYSTEM (NEW APPENDIX)

APPENDIX E: PRELIMINARY O&M PLAN FOR STORM WATER BMPS (NEW APPENDIX)

APPENDIX F: OFFSTREET PARKING AND TREES ADJACENT TO WAREHOUSES (NEW APPENDIX)

APPENDIX G: VISUAL IMPACT MITIGATION(NEW APPENDIX)

APPENDIX H: LIGHT POLLUTION MITIGATION (NEW APPENDIX)

APPENDIX I: BUFFER ZONE DEVELOPMENT PLAN (NEW APPENDIX)

APPENDIX J: DRAINAGE DITCH ALONG KAPA'A QUARRY ROAD (NEW APPENDIX)

APPENDIX K: STATUS OF PROJECT SITE DEVELOPMENT WORK (NEW APPENDIX)

APPENDIX L: RELOCATION OF POWER LINES OVER LOWER SITE (NEW APPENDIX)

Appendix A:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

SCOPING REPORT
(APPENDIX WAS PART OF DSEIS)

APPENDIX A

DPP Determination letter requiring the SEIS

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

FILE

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

April 8, 2020

2020/MOD-11(ZS)
2014/SMA-27

Mr. Manfred Zapka
Sustainable Design & Consulting, LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

SUBJECT: Request for Minor Modification
Special Management Area (SMA) Use Permit
No. 2014/SMA-27
Kapaa Light Industrial Park
897 Kalanianaole Highway - Kailua
Tax Map Key 4-2-015: 014

This is in response to your submittal, received February 26, 2020, to modify the subject SMA. We regret to inform you that the submitted information is incomplete because the proposed modifications require a supplemental Environmental Impact Statement (EIS), as explained below.

You propose to modify the approved plans for the site because of design constraints that have arisen since the previous EIS, SMA (File No. 2014/SMA-27) and two subsequent Minor Modifications (File Nos. 2016/MOD-68 and 2017/MOD-37). The modifications proposed in the current application involve the stormwater management system, number of structures and building area, grading, perimeter berms, irrigation system, wastewater system, and roadway access (Pages 1 through 4 of the application). You state that the site has already been graded in accordance with approved plans, but there are no impervious surfaces or structures at this time (Page 9).

According to Hawaii Administrative Rules Chapter 11-200.1-30, a supplemental EIS is required if modifications may have significant environmental impacts. In addition, subsection (b) states, "A supplemental EIS shall be warranted ... when the mitigating measures originally planned will not be implemented, or where new circumstances or

evidence have brought to light different or likely increased environmental impacts not previously dealt with."

The proposed stormwater management system is significantly different compared to the stormwater management system described in the EIS. The proposed modifications involve significantly more impervious surface area, significantly less stormwater harvesting capacity and reuse, and a modified treatment system that eliminates infiltration. The proposed modifications no longer include large landscaped areas within the site that were described in the EIS. According to Page 184 of the EIS, pervious, vegetated areas manage a significant portion of stormwater through retention in the topsoil and evaporation. Because the proposed modifications involve less landscaped area to irrigate, the capacity to store and reuse stormwater has been reduced by about half (Page 3 of the modification request). The previously approved stormwater management system allowed stormwater to infiltrate under perimeter berms made of fill material designed to treat the stormwater (according to Minor Modification No. 2017/MOD-37, approved August 25, 2017). Stormwater would then migrate towards an existing ditch along Kapaa Quarry Road. A 2019 geotechnical report has since concluded that this would compromise the berm's stability. Instead, the proposed modifications direct stormwater through a manufactured treatment device and then directly into Kapaa Stream. It is unclear whether these modifications will cumulatively result in an increase in the volume of untreated overflow stormwater, which may have a significant environmental impact. In addition, the mitigating measures originally planned, including stormwater harvesting, pervious surfaces, and infiltration are significantly modified and will not be implemented as described in the EIS.

The proposed site design is also significantly different compared to the site design described in the EIS. The site design described in the EIS involves 15 buildings with a total building area of 337,000 square feet, while the proposed modification involves 14 buildings with a total building area of 373,200 square feet. Additionally, the finish grade must be raised to accommodate proposed changes to the stormwater management system. The previously approved finish grade ranges from 25 to 39 feet, while the proposed finish grade ranges from 40 to 50 feet (Page 42 of the application). The proposed finish grade is an average of 11.6 feet higher than what was previously approved, and will require 390,000 cubic yards of additional fill material. Page 325 of the EIS states a visual impact analysis shows that visual impacts can be mitigated. The proposed modifications significantly elevate the site features, which may result in a significant impact.

The proposed modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS. We will publish this determination in *The Environmental Notice*. The supplemental EIS should include, at minimum, the following:

- The percentage of annual stormwater that will overflow and bypass the proposed manufactured treatment device, as compared to the existing conditions and the approved plans under the EIS;

- The impact that treated and untreated stormwater will have on the stream and marsh, as compared to the existing conditions and the approved plans under the EIS;

- An analysis of alternatives, including the alternative of directing stormwater to the basin west of the Project site, and the impacts on water quality in the stream and marsh; and

- The visual impacts that the elevated site will have, as compared to the approved plans under the EIS.

The original application materials, including the $200 check, are enclosed. Should you have any questions, please contact Zack Stoddard, of our Land Use Approval Branch, at (808) 768-8019 or zachary.stoddard@honolulu.gov.

Very truly yours,

Kathy K. Sokugawa
Acting Director

Enclosure: Check No. 0415

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Friday, May 1, 2020 11:10:25 AM

Action Name

Kapaa Light Industrial Park

Type of Document/Determination

Supplemental environmental impact statement (EIS) determination

HRS §343-5(a) Trigger(s)

- (6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation

Judicial district

Koʻolaupoko, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 4-2-015:014

Action type

Applicant

Other required permits and approvals

Numerous

Discretionary consent required

Minor Modification to Major Special Management Area permit

Approving agency

City and County of Honolulu, Department of Planning and Permitting

Agency contact name

Zack Stoddard

Agency contact email (for info about the action)

zachary.stoddard@honolulu.gov

Agency contact phone

(808) 768-8019

Agency address

650 South King Street
Honolulu, HI 96813
United States
Map It

Accepting authority

City and County of Honolulu, Department of Planning and Permitting

Applicant

Kapaa I, LLC

Applicant contact name

Paul King

Applicant contact email

sustainableDC@gmail.com

Applicant contact phone

(808) 261-8991

Applicant address

905 Kalanianaole Highway
Kailua, HI 96734
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Sustainable Design & Consulting, LLC

Consultant contact name

Manfred Zapka

Consultant contact email

sustainableDC@gmail.com

Consultant contact phone

(808) 265-6321

Consultant address

P.O. Box 25914
Honolulu, HI 96825
United States
Map It

Action summary

The proposed industrial park would be adjacent to the Kapaa Stream and mauka of the Kawainui Marsh. Only grading work has been completed so far.

The final EIS for the project was accepted on 10/11/2011. Since then, the Department of Planning and Permitting approved a major Special Management Area permit (file number 2014/SMA-27) and two minor modifications to that permit (file numbers 2016/MOD-68 and 2017/MOD-37). The applicant is requesting to modify the Special Management Area permit a third time because design constraints have arisen.

The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. As explained in the determination letter, the modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be

implemented as described in the EIS.

Attached documents (signed agency letter & EA/EIS)

- 2020MOD-11-determination.pdf

Shapefile

- The location map for this determination is the same as the location map for the associated Final EIS.

Authorized individual

Zack Stoddard

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Sustainable Design & Consulting LLC
Practical Sustainability

2020 FEB 26 AM 10: 28
DEPT OF PLANNING AND PERMITTING CITY & COUNTY OF HONOLULU

2020/ELOG-415

February 25, 2020

Kathy K. Sokugawa, Acting Director
Department of Planning & Permitting
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, HI 96813

Subject: Minor Modification Application for Special Management Area Use Permit (SMP Resolution 14-222, File No. 2014/SMA-27)

Dear Ms. Sokugawa,

Our company is the consultant for Mr. Paul King, the Applicant, and we are submitting this SMP Minor Modification Application on his behalf.

The Applicant is in the process of carrying out site development work on portions of the Kapa'a Light Industrial Park project site situated in TMK 4-2-15:014. The site work will prepare the project site for the future construction of several warehouses. The development goals of Kapa'a Light Industrial Park have been approved by the City Council as part of the conditional zone change and the approved subject Major SMP.

We have attached the Master Application Form and the Written Statement and Project Description report to this SMP Minor Modification application. In our report, we propose changes to seven previously approved site development design strategies. The changes are required as site development constraints were identified during the ongoing detail design phase.

Our report concludes that impacts to the environment and the community will not be negatively affected by the proposed SMP modification. In fact, impacts to the adjacent aquatic resources, especially to the adjacent Kapa'a Stream and wetland areas, will be reduced due to the more effective stormwater pollution and flooding mitigation strategies.

The proposed modifications will not negatively affect approved site development permits, including the buffer zone development concept (approved by DLNR), the NPDES construction stormwater permit (approved by DoH) and the site development phasing plan (approved by DPP and DoH).

Our report concludes that the estimated project costs will not increase relative to the original and accepted SMP.

We would like to ask for your support in accepting our proposed actions. The Applicant is in the process of grading the site in accordance with the current grading permit.

Letter to: Ms. Kathy K. Sokugawa, Acting Director, , Department of Planning & Permitting
City and County of Honolulu, Feb. 25, 2020 Page 2 of 2

The Applicant would like to complete the earth berms and the planting of vegetation on the earth berms early in the project, since vegetated berms will be instrumental in providing effective visual impact mitigation and the plants on the berms need time to grow. The Applicant requests DPP's approval of this SMP Minor Modification as soon as possible to enable the next phase of the site development.

If you have any questions or comments, please do not hesitate to contact us via email at **sustainableDC@gmail.com** or call 808-265-6321. I will be off island in March, and but will be able to respond to your comments in a timely way via email or phone. If, based on our initial discussions, you require submittal of an amended written statement and/or plans, I will submit this in early April.

Sincerely,
Sustainable Design & Consulting LLC

Manfred Zapka

Manfred J. Zapka, PhD, PE
Principal

Attachments: Master Application Form, Application Fees ($200.00), 2 copies of the Report "Written Statement and Project Description"

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING & PERMITTING
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

LAND USE PERMITS DIVISION MASTER APPLICATION FORM

Additional data, drawings/plans, and fee requirements are listed on a separate sheet titled "Instructions for Filing." ***PLEASE ASK FOR THESE INSTRUCTIONS.***

All specified materials described in the "Instructions for Filing" and required fees must accompany this form; incomplete applications will delay processing. You are encouraged to consult with Zoning Division staff in completing the application. Please call the appropriate phone number given in the "Instructions for Filing."

Please print legibly or type the required information. **SUBMITTED FEE: $** $200

PERMIT/APPROVAL REQUESTED (Check one or more as appropriate):

Cluster:
- ☐ Agricultural
- ☐ Country
- ☐ Housing

Conditional Use Permit:
☐ Minor ☐ Major

☐ Existing Use: _____ (Indicate Type of Use)

Environmental Document:
- ☐ Environmental Impact Statement
- ☐ Environmental Assessment
- ☐ Supplemental

☐ Minor Shoreline Structure

☒ **Modify Approved Permit:** SMP 2014/SMA-27 (Indicate Reference File No.)

☐ Plan Review Use

Planned Development:
- ☐ Housing
- ☐ Commercial (WSD Only)
- ☐ Resort (WSD Only)

☐ Shoreline Setback Variance

Special District Permit:
☐ Minor ☐ Major _____ (Indicate District)

☐ Downtown Height >350 Feet

Special Management Area Use Permit:
☐ Minor ☒ Major

☐ Temporary Use Approval

☐ Variance from LUO Section(s): _____

☐ Waiver from LUO Section(s): _____

☐ Zoning Adjustment, LUO Section(s): _____

☐ HRS Section 201H-38 Project

TAX MAP KEY(S): (1) 4-2-15:014 (port. of) (Note: the TMK designation of the project site has changed from the initial 4-2-15:006)
LOT AREA:
ZONING DISTRICT(S): I-1 and P-2 **STATE LAND USE DISTRICT:** Urban
STREET ADDRESS/LOCATION OF PROPERTY: 905 Kalanianaole Hwy., Kailua, HI 96734

RECORDED FEE OWNER:
Name (& title, if any) Kapa'a I, LLC, Paul King, GM
Mailing Address 905 Kalanianaole Hwy., Kailua, HI 96734
Phone Number (808) 261-8991
Signature
PRESENT USE(S) OF PROPERTY/BUILDING:
Outside storage

PROJECT NAME (if any): Kapa'a Light Industrial Park
, development in TMK 4-2-15:014 (port. of)

APPLICANT:
Name Mr. Paul King, GM, Kapa'a I, LLC
Mailing Address 905 Kalanianaole Hwy., Kailua, HI 96734
Phone Number (808) 261-8991
Signature
AUTHORIZED AGENT/CONTACT PERSON:
Name SDC, LLC, M. Zapka, Ph.D., P.E.
Mailing Address P.O. Box 25 914
Honolulu, Hawaii, 96825
Phone Number (808) 265 6321
E-mail sustainableDC@gmail.com
Signature

2020 FEB 26 AM 10:28
DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

REQUEST/PROPOSAL (Briefly describe the nature of the request, proposed activity or project):
This Minor Modification application requests changes to seven site development approaches which were approved under SMP 2014/SMA-27 and 2017/MOD-37 (MT). The request for changes is prompted by design constraints that rule out the previously approved site development design strategies. In particular, the accepted stormwater drainage and treatment strategy needs to be modified. This includes a raised finish grade which provides the required hydraulic flow energy to convey stormwater over a longer distance to the Northern site perimeter. Further proposed modifications include: Changing the site road access, implementing a more advanced onsite wastewater treatment system, omitting the accepted baseyard and building additional warehouses on the baseyard areas and increasing the total building footprint. The design changes will not increase the environmental impacts, nor increase the estimated overall project costs.

POSSE JOB NO. _____

APPENDIX B

Presentation given during the July 2, 2020 Public Scoping Meeting

Welcome to the Public Scoping Meeting

Kapa'a Light Industrial Park
Supplemental EIS

Online Meeting
July 2, 2020; 2:30 pm

Introductions

Phyllis Horner, PhD
Facilitator
CEO of Great Places & Spaces LLC

Manfred Zapka, PhD, PE
Presenter & Project Lead
Principal of Sustainable Design & Consulting LLC

Goal

The goal of this meeting is to gather early public input on the scope of the study, potential alternatives, and areas of concern related to the continued development of the Kapa’a Light Industrial Park.

- **Introduction and Ground Rules – 10 minutes**
- **Presentation – 15 minutes**
- **Oral public comments – 30 minutes**
- **Closing and Next Steps – 5 minutes**

Ground Rules and Agreements

1. Please wait for the short presentation to end before you ask questions.
2. Please Mute your audio unless you are asking a question.
3. Please use the **Chat** option to submit a comment or ask to be heard.
4. Agreements with one another:
   - Courtesy
   - No offensive language
   - Give time for all to be heard – keep comments brief
5. Things to Note:
   - This is an input meeting so we know what issues to address – the goal is to hear your **comments so that they can be considered in the scope** of the DRAFT SEIS.
   - This meeting **will not attempt** to solve possible design and development problems.
   - We will audio **record the session** and the oral comments, and they will become part of the SEIS documentation
   - You will have **until July 23, 2020** to submit additional comments in writing.

Purpose and Need

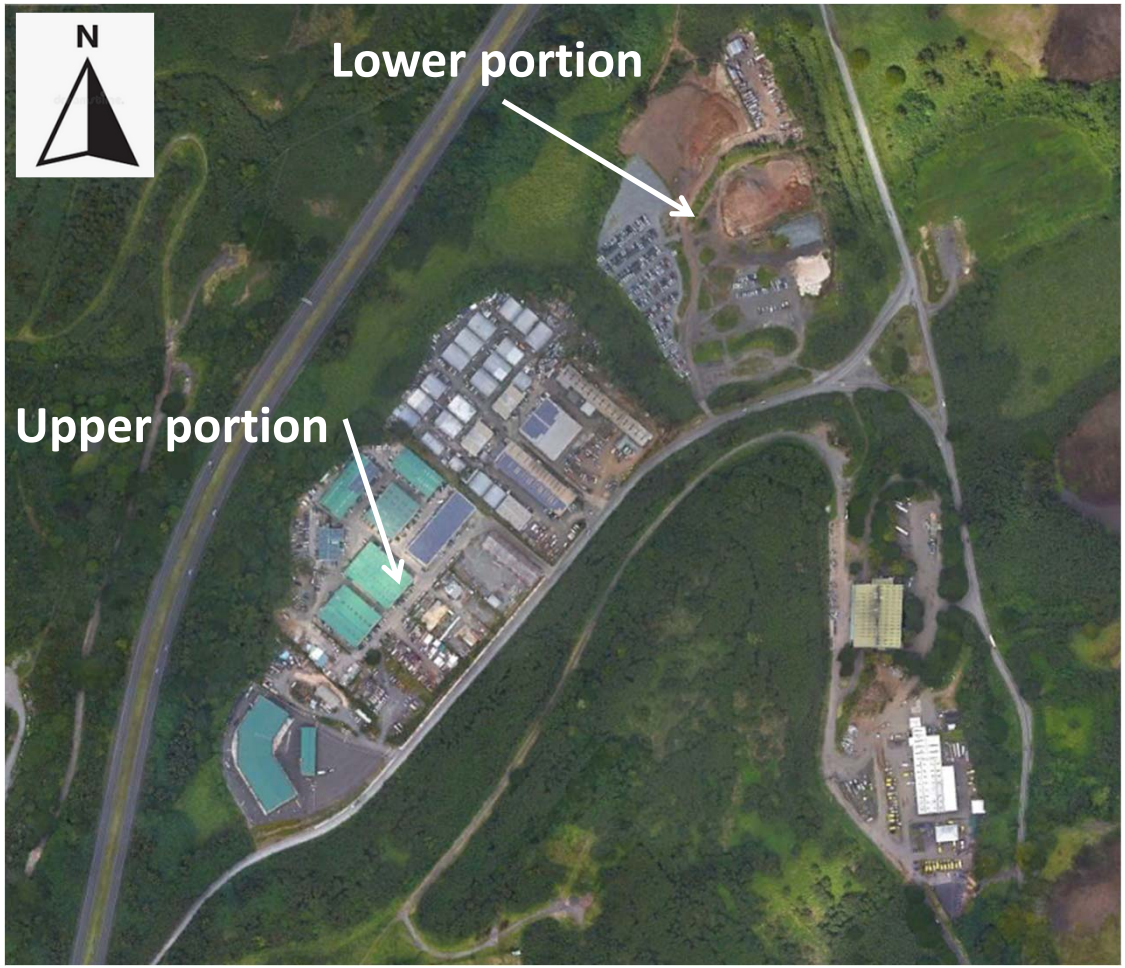
Purpose: To continue with the development of the Kapa'a Light Industrial Park using updated Master Site Development Plan

Need: The proposed action is needed to implement the updated site development plan and particularly to implement the new proposed and improved impact mitigation

1. Overview of Previous Major Land Use Permits and Approvals:

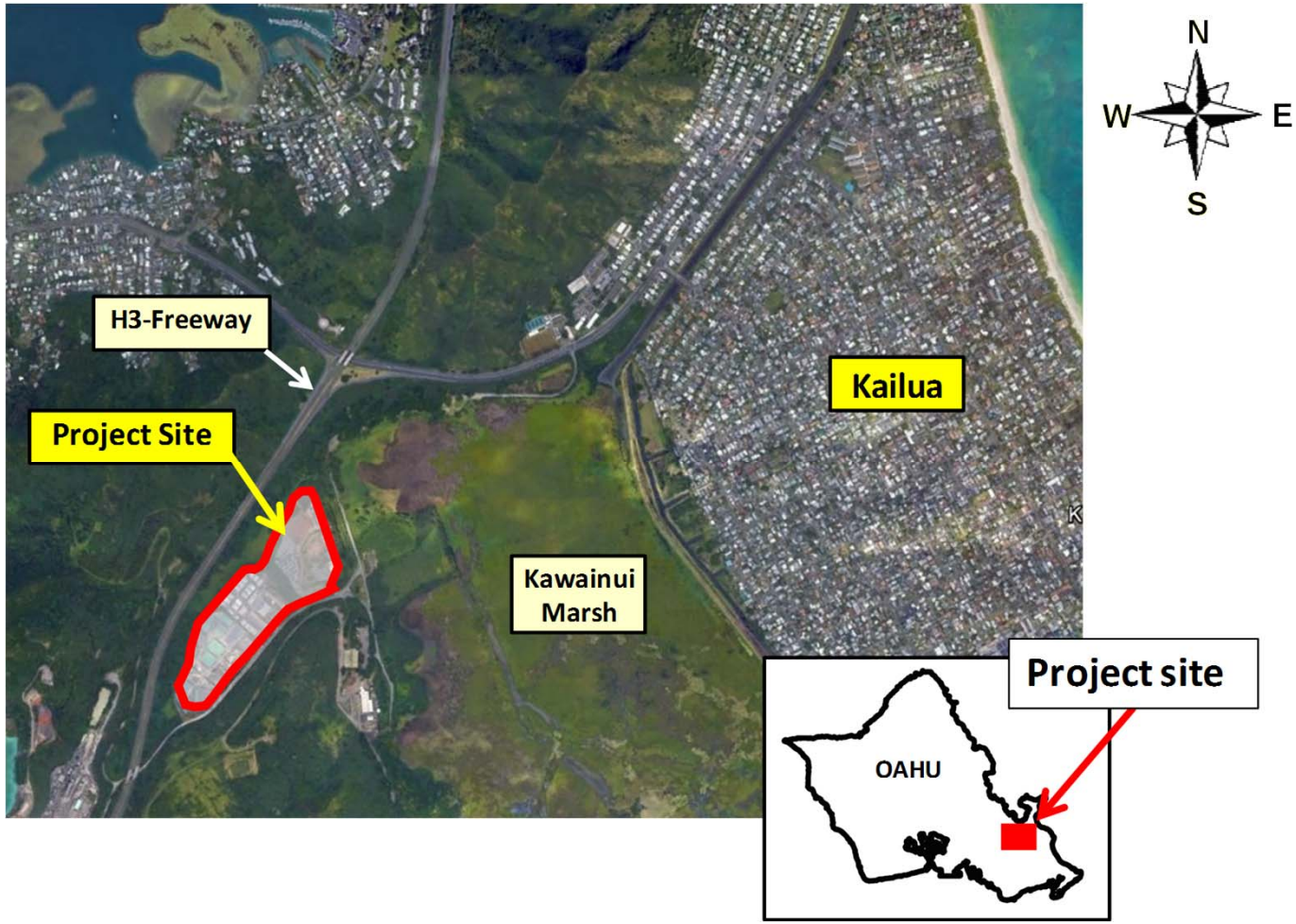
Year	Description
2011	FEIS accepted for the continued development of the Kapa'a Light Industrial Park (KLIP)
2013	Zone change accepted for two parcels of the KLIP project site
2014	Special Management Area Use Permit (SMP) accepted for the Lower portion of the project site
2017	Minor Modification for SMP accepted for the Lower Portion
2019	Minor Modification SMP application Not accepted for the Lower Portion and Supplemental EIS required to implement proposed changes
2020	Supplemental EIS process started

2. Existing Conditions Kapa'a Light Industrial Park

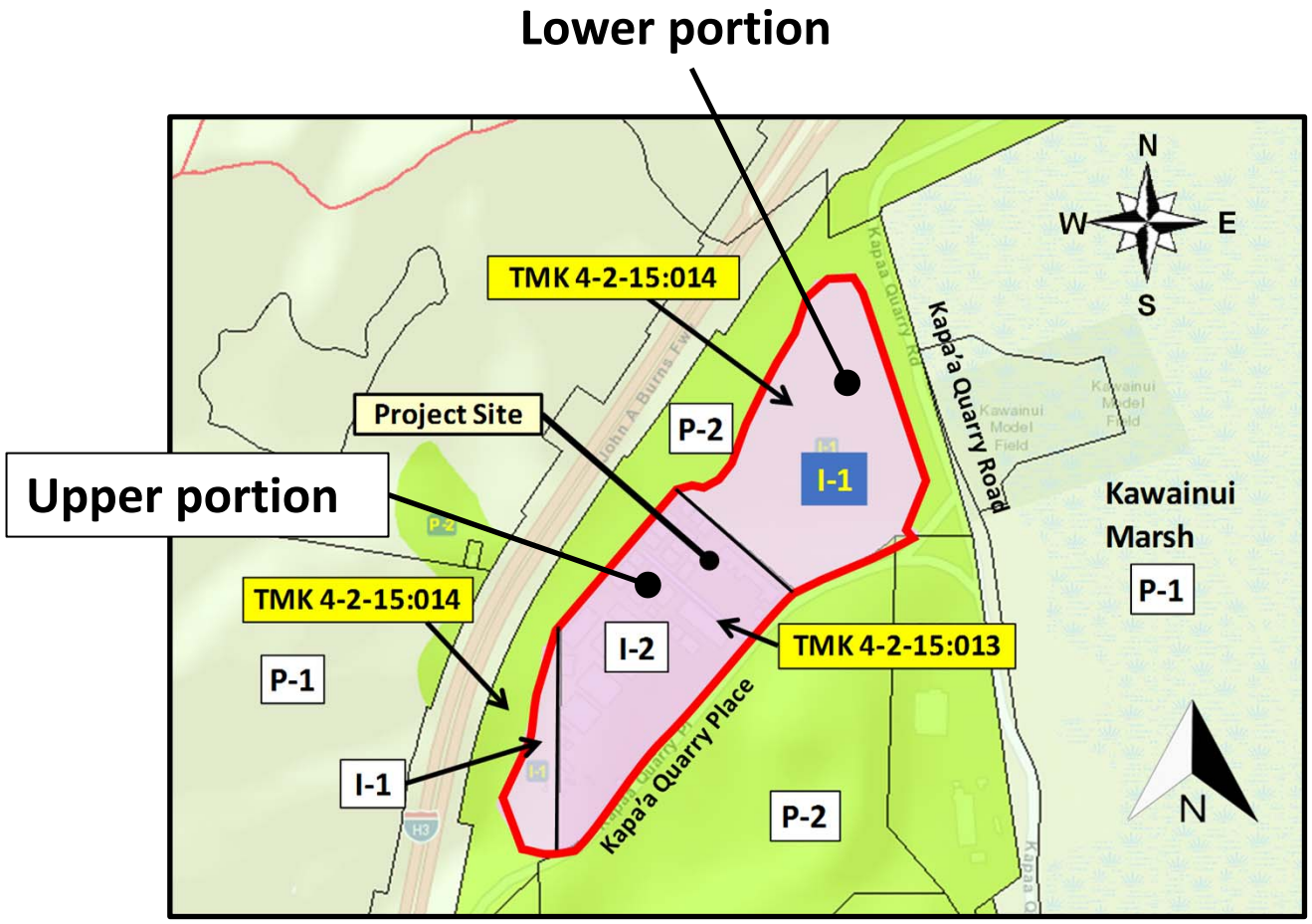


Completion of additional Buildings within the Upper portion of the site;
Start grading the Lower portion of the site

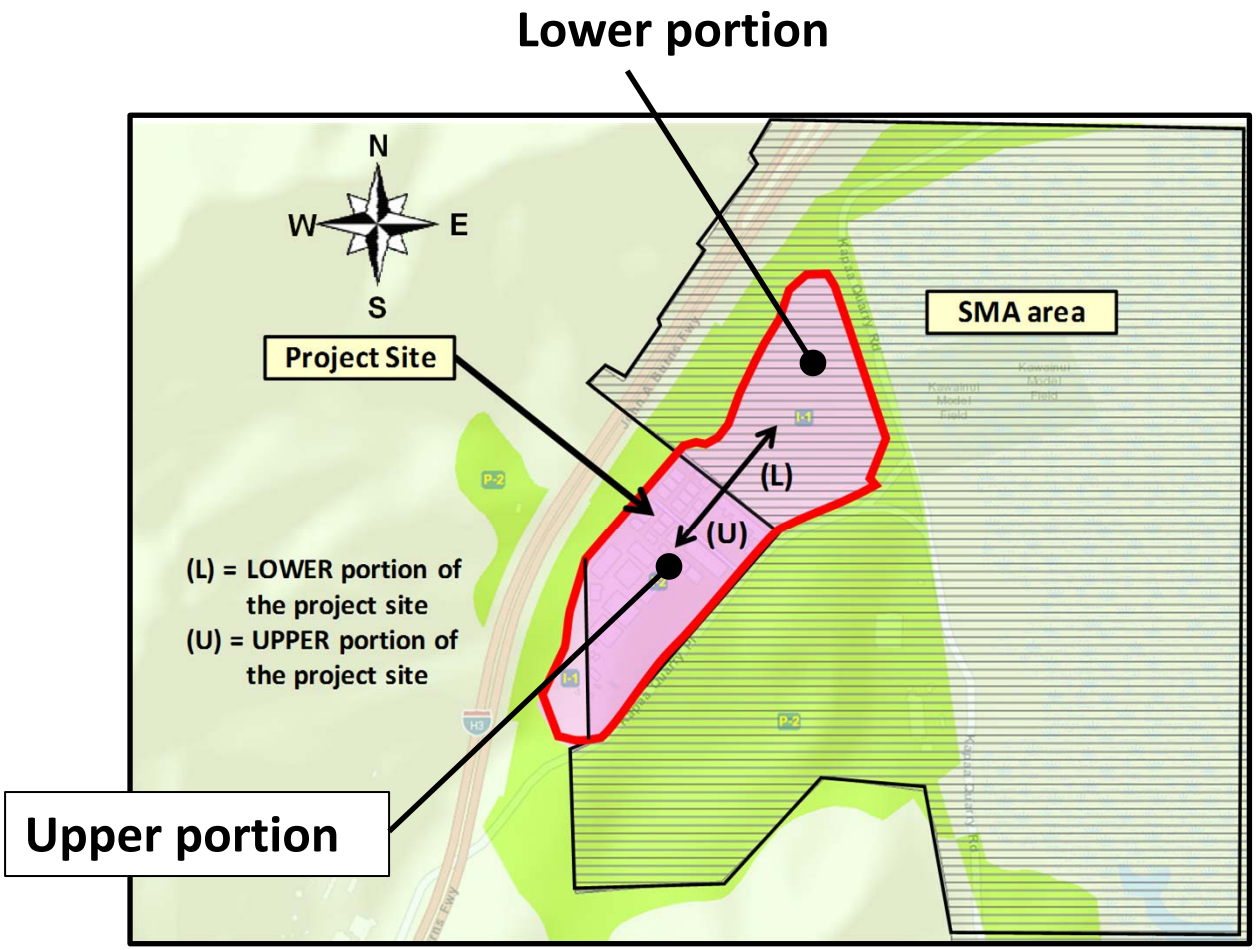
3. Proposed Action: Project Location



4. Proposed Action: TMK boundaries

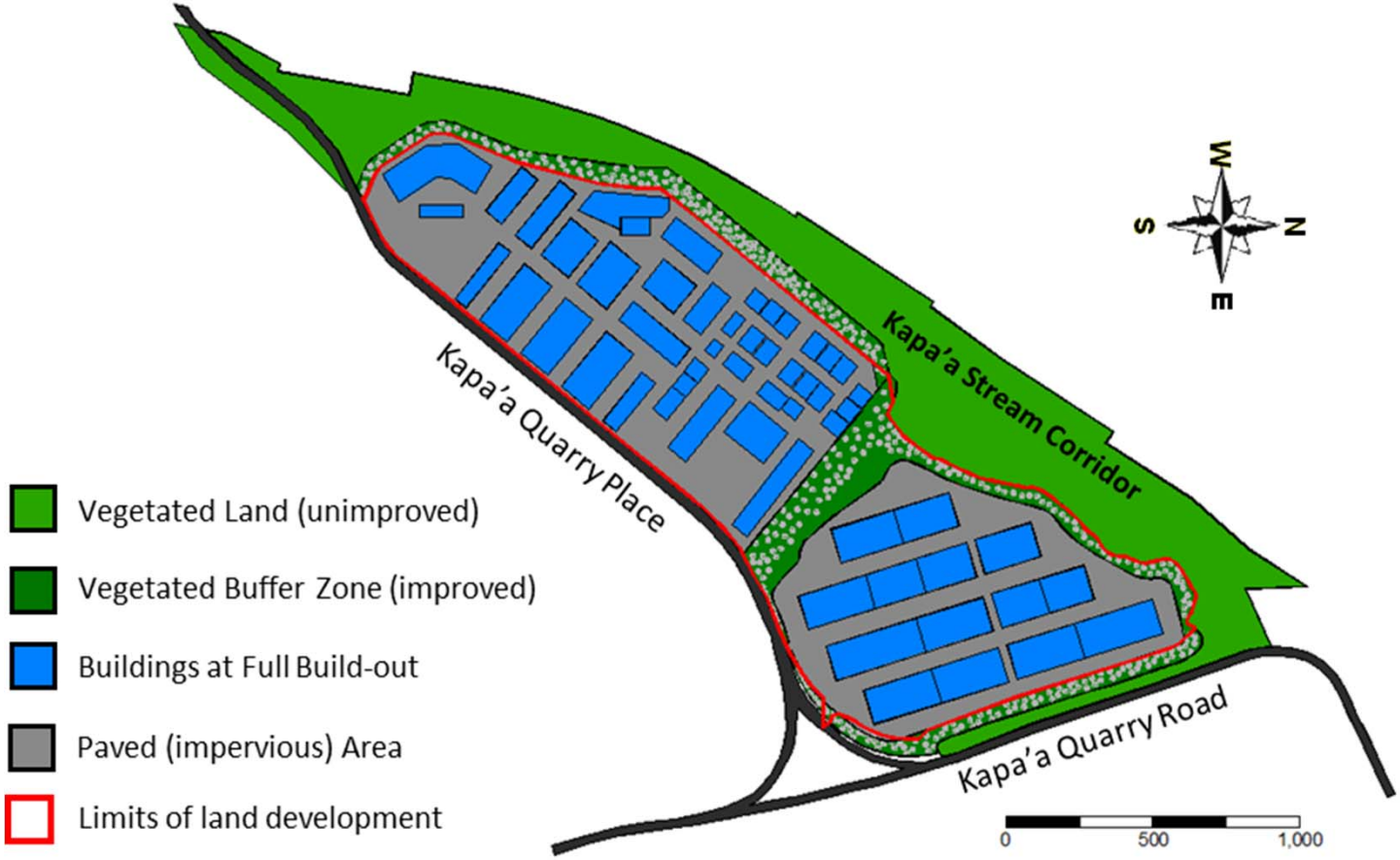


5. Proposed Action: SMA Boundaries

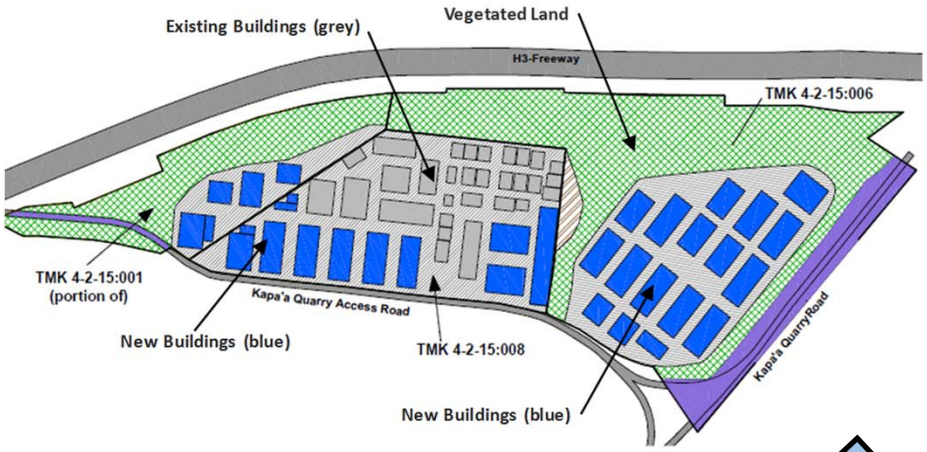


The Lower portion of the site is within the SMA area

6. Proposed Action: Updated Site Development Plan

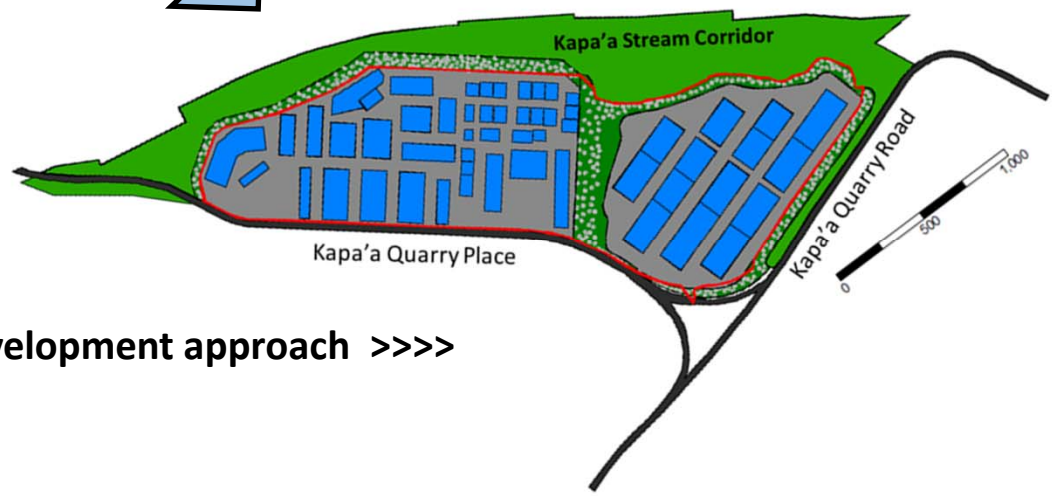


7. How the SEIS compares to the Accepted EIS



Accepted FEIS

<<< Full build-out site layout delineated in the accepted FEIS



Supplemental EIS

Updated site development approach >>>>

8. SUMMARY OF MAJOR CHANGES – ACCEPTED FEIS VERSUS PROPOSED ACTION (PART 1)

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
A	Storm water drainage and treatment technology; better pollution control	More stringent storm water permit guidelines design constraints
B	Strom water harvesting for irrigation;	Less vegetated area to irrigate
C	Site finish grade elevation; increased site elevation	Required for storm water conveyance
D	Site perimeter berms; increased to accommodate increased site grate	Required to stabilize finish grate
E	Pervious and vegetated areas; reduced	Avoid infiltration and generation of harmful leachate
F	Irrigation; changed irrigation needs	Less vegetated areas to irrigate

9. SUMMARY OF MAJOR CHANGES – ACCEPTED FEIS VERSUS PROPOSED ACTION (PART 2)

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
G	Wastewater treatment technology; advanced technology	Desire to lower impacts
H	Changed site road access: use only one road access	Reduce traffic risks and create simpler traffic flow
I	Changed layout of buildings;	Improve internal movement and align to traffic flow

10. Potential Impact Topics

Natural and Physical Environment

- Climate and Climate Change
- Geology, Soils, and Topography
- Water Resources
- Stormwater
- Wetlands
- Vegetation and Wildlife
- Threatened, Endangered, and Sensitive Species
- Air Quality
- Noise

Infrastructure and Waste Management

- Utilities
- Public Services and Facilities
- Traffic, Transportation and Parking
- Onsite Wastewater Management

Other

- Visual Impact
- Socio Economic Characteristics
- Secondary and Cumulative Impacts
- Archaeological Resources

11. Preliminary Draft Development Alternatives

Option 1 – Proposed Action:

Implement proposed updated site development features and improved impact mitigation strategies.
Respond to new design needs and constraints

Option 2 – No Action Alternative:

Investigate the consequences on impact mitigation if the proposed improved impact mitigation strategies are not adopted

12. Schedule/Next Steps

Public Scoping Meeting	Today
End of Public Scoping Period	July 23, 2020
Preparation of Draft Supplemental EIS (SEIS)	October 2020
Draft SEIS Public Comment Period	Nov. / Dec. 2020
Final EIS	Jan. 2021

Ways to Comment

Submit oral comment today: Your comments will be recorded and referenced in the Draft SEIS

Submit written comments electronically to:
sustainabledc@gmail.com

Mail written comments to:
Attention: Manfred Zapka, Ph.D.,P.E.
Sustainable Design & Consulting LLC
P.O. Box 25914
Honolulu, Hawaii 96825

All comments are due to Sustainable Design & Consulting LLC by July 23, 2020

Thank you very much for your attention and interest

APPENDIX C

Letters and emails received

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
KAY C. MATSUI
RAY C. SOON
MAX J. SWORD

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

July 8, 2020

Manfred Zapka, Ph.D., P.E.
Sustainable Design & Consulting LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

Subject: Your Email Dated June 29, 2020 Requesting Comments on the Proposed Supplemental Environmental Impact Statement Preparation Notice for the Kapaa Light Industrial Park, Kailua, Oahu, Hawaii
Tax Map Key: 4-2-015: 013 and 014

Thank you for the opportunity to comment on the proposed Supplemental Environmental Impact Statement Preparation Notice (SEISPN).

Water pipeline easements shall be granted to the Board of Water Supply (BWS) for all water mains to be conveyed to the BWS which are located within private properties and roadways that will not be dedicated to the City and County. Please coordinate with our Lands Division at 748-5910.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The developer should investigate the feasibility of using nonpotable water for irrigation of the proposed industrial park. If nonpotable water is either unavailable or infeasible, a report of the investigation including proposed irrigation demands should be submitted to us before we will consider the use of potable water.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

July 6, 2020

Mr. Manfred Zapka, PhD, PE, Principal
Sustainable Design and Consulting LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

SUBJECT: Supplemental Environmental Impact Statement Preparation Notice
Kapaa Light Industrial Park
Kailua, Hawaii

Thank for the notice that the subject SEISPN has been published and an EIS Public Scoping meeting will be held online on July 2, 2020.

The Department of Parks and Recreation has no comment..

Should you have any questions, please contact Mr. John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(817725)

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
CLYDE K. HO
DEPUTY CHIEFS

OUR REFERENCE EO-DK

July 7, 2020

SENT VIA EMAIL

Mr. Manfred Zapka, Principal
sustainabledc@gmail.com

Dear Mr. Zapka:

This is in response to your e-mail of June 29, 2020, regarding the Supplemental Environmental Impact Statement (EIS) Preparation Notice and EIS Public Scoping meeting relating to the proposed modifications to the Kapaa Light Industrial Park located in Kailua.

The Honolulu Police Department has reviewed the plans and does not have any comments or concerns at this time.

If there are any questions, please call Acting Major Brian Lynch of District 4 (Kaneohe, Kailua, Kahuku) at 723-8639.

Thank you for the opportunity to review this project.

Sincerely,

ALLAN T. NAGATA
Assistant Chief of Police
Support Services Bureau

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Director
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
HWY-PS 2.3225

July 27, 2020

Mr. Manfred Zapka
Sustainable Design and Consultant
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

Subject: Request for Comments
Supplemental Environmental Impact Statement Preparation Notice
Kapaa Light Industrial Park Masterplan – Kailua, Oahu, Hawaii
Tax Map Key No: (1) 4-2-015: 013 and 014

Thank you for your letter dated June 16, 2020 and the opportunity to review the subject project on the preparation of a Supplemental Environmental Impact Statement (SEIS) Preparation Notice required by Chapter 343, Hawaii Revised Statutes, due to revisions to the Final Environmental Impact Statement accepted on October 11, 2011 for the purpose of a County rezoning application.

The proposed 57-acre site involving an upper and a lower portion area for the development of approximately 892,000 square-foot of building footprint. The overall project has been partially developed with proposed modifications to prior designs and site development density, as well as various improvements. The site's internal traffic circulation will be revised, as well as the external roadway accesses will be modified into one single access point from Kapaa Quarry Place (formerly as Quarry Access Road); a 2-lane, County roadway.

The Hawaii Department of Transportation (HDOT) has the following comments:

1. An Updated Traffic Impact Analysis Report (TIAR) for the full buildout will be required to be submitted to the HDOT Highways for the review and acceptance.

   1.1. Although a 2012 TIAR was accepted by HDOT (letters HWY-PS 2.3418 and HWY-PS 2.4354 attached) for Phase A, B and C only, it does not include Phase D and buildout. The Updated TIAR should clarify if there will be a phasing plan or a timetable for development construction, which should be consistent with the upcoming SEIS.

1.2. Since the 2012 TIAR was done over 8 years ago, the conclusions, trip generations and traffic volumes should be revised.

1.3. The study should verify the traffic conditions particularly on both intersections of Kapaa Quarry Road/Mokapu Boulevard (Route 630) and Kapaa Quarry Road/State Kalanianaole Highway with recommended mitigations for any direct traffic impacts to the State roadways at no cost to the State.

1.4. The Applicant is required to coordinate with HDOT for an agreeable pro-rata contributions to the cost of regional improvements with an acceptable timeline for the construction.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2020-100.

Sincerely,

JADE T. BUTAY
Director of Transportation

Attachments: Letters (HWY-PS 2.3418 and HWY-PS 2.4354)

c: Office of Environmental Quality Control
Department of Planning and Permitting (Zachary Stoddard)

THE LANI - KAILUA OUTDOOR CIRCLE

"Keeping Kailua Clean, Green and Beautiful since 1948!"

July 13, 2020

Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813
Zack Stoddard
zachary.stoddard@honolulu.gov

CC:
KAPAA I, LLC and KAPAA III, LLC
905 Kalaniana'ole Highway
Kailua, HI 96734
Paul and John King
sustainableDC@gmail.com

Sustainable Design & Consulting, LLC
P.O. Box 25914
Honolulu, HI 96825
Manfred Zapka
sustainableDC@gmail.com

SUBJECT: Kapa'a Light Industrial Park Expansion Plan SEIS

The Lani-Kailua Outdoor Circle has serious concerns about the Kailua Light Industrial Park's (KLIP) Supplemental Environmental Impact Statement (SEIS), as published in "The Environmental Notice" in June, 2020.

This is a different plan than what was initially approved by DPP in 2014. In addition, the economic and political environment has evolved and climate change factors and global warming now have to be taken into consideration.

It is imperative that the previously accepted, but not fully-implemented, 2014 EIS be re-evaluated to determine if it is still valid with respect to "size, scope, location, intensity, use or timing", and in the best interests of Hawaii's residents and the environment.

The SEIS is an opportunity for such re-evaluation.

This SEIS is asking for changes to:

- the stormwater management system,
- number of structures,
- size of impervious areas,
- wastewater and irrigation systems,
- roadway access and
- perimeter berms.

In particular, substantial changes to the original 2014 plan are:

- The use of a manufactured treatment device to direct stormwater directly into Kappa's Stream;
- heightening the finished grade an average of 11.6 feet above the original plan;
- adding 36,000 more sq ft of building area;
- adding 390,000 cubic yards of fill material.

Areas of past and present community concern are:

- Increasing the impervious surface area of the project, while reducing vegetated areas that could be used for stormwater retention, introduces environmental impacts not previously dealt with in their approved 2014 EIS; As reference, the City's Opala.org website notes that water in storm drains flowing directly into streams or to the ocean seriously contaminates the environment with hazardous materials;
- Traffic impacts and safety;
- Light and noise pollution impacting endangered waterbirds;
- The obstruction of natural view planes.

Questions and concerns that should now be addressed are:

1. What effects will these changes in the project have on:
- federally listed threatened and endangered species
- traffic safety and gridlock
- water quality in Kapa'a Stream, Kawainui Marsh, Oneawa Canal and Kailua Bay
- flooding, view planes, aquatic resources
- pollution from leaching

2. How does this plan's use of a manufactured treatment device to direct stormwater directly into Kappa's Stream comply with section 404(b) guidelines of the Clean Water Act?

3. How would the project prepare for a failure of the manufactured treatment device that processes stormwater before it enters Kapa'a Stream? Are there backup systems?

4. How will water quality be measured/monitored and what steps will be taken to assure conformity to all existing laws?

5. The SEIS should provide a map of the historic location of Kapa'a Stream and the Kawainui Landfill and show where the present project will be located in relation to them.

6. The SEIS should provide an analysis of the current market need for the project in light of COVID-19, including a discussion of anticipated public access and use of the facilities.

7. The SEIS should identify the environmental impacts from septic systems as compared to connections to a sewer line.

8. The SEIS should include a "No Build" Alternative with revegetation of the site with native plants.

9. Given that the site entrance has changed, an updated traffic study should be done.

A new EIS should be required, given the scope of changes being requested.

Sincerely,

The Lani-Kailua Outdoor Circle
President Diane Harding
Lani-Kailua@outdoorcircle.org

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

s

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

April 1, 2019

Gmail

Manfred Zapka <sustainabledc@gmail.com>

Kapa‘a Light Industrial Park (Supplemental EIS Preparation Notice) - Online Public Scoping

billhicksknb@gmail.com <billhicksknb@gmail.com> Wed, Jul 15, 2020 at 8:45 AM
To: Manfred Zapka <sustainabledc@gmail.com>
Cc: Phyllis Horner <leaderswisdom@gmail.com>, tapaka53 <tapaka53@aol.com>, "Nomura, Janelle" <janelle.nomura@honolulu.gov>, "Naylon, Chris" <chris.naylon@honolulu.gov>

Aloha Manfred…

Mahalo for the update.

ZOOM is a new thing for us – the first use was at our July 2nd Regular Meeting. Our Vice Chair, Levani Lipton, handled the ZOOM set up and I’m sure she would welcome a practice run. I’ll send a separate email to her and cc you (I can only send email to one board member at a time).

This seems to be an unusual situation where, as your notice states, the modifications may have significant environmental impacts and mitigating measures will not be implemented as described in the EIS. Therefore, we would greatly welcome the background information.

Teresa Parsons was the designated KNB representative to participate in the EIS Public Scoping meeting on July 2nd which you invited us to on June 29th. Her role was to ask questions as part of conducting fact finding. I’m disappointed that the ZOOM protocols locked-out her participation.

I echo her comments that the entire board would be very interested in a design proposal presentation, that the Kailua public is very engaged in review and comment on community development projects, and having a presentation sooner rather than later will bode well for all entities. She was standing right beside me when she had that email exchange with you.

At the end of your presentation on August 6th there will likely be questions from individual board members, and possibly residents as well, in addition to the questions already asked by Teresa Parsons. They should be recorded as individual questions from KNB board members and residents. Because the KNB can only deliberate in public sessions, and emails are limited to one-on-one exchanges, there is no efficient way for the KNB to gather questions in advance, but Teresa and I will forward any questions that we do receive on to you. Once the KNB establishes a position, I can then speak for the entire board.

Looking forward to your presentation on August 6th. Mahalo.

[Quoted text hidden]

Gmail

Manfred Zapka <sustainabledc@gmail.com>

Kapa‘a Light Industrial Park (Supplemental EIS Preparation Notice) - Online Public Scoping

billhicksknb@gmail.com <billhicksknb@gmail.com> Tue, Jul 7, 2020 at 5:42 PM
To: Manfred Zapka <sustainabledc@gmail.com>
Cc: leaderswisdom@gmail.com, tapaka53 <tapaka53@aol.com>, "Nomura, Janelle" <janelle.nomura@honolulu.gov>, "Naylon, Chris" <chris.naylon@honolulu.gov>

Aloha Manfred…

This is Bill Hicks, Chair of the Kailua Neighborhood Board. I’m sorry current policy prevents you from attending our August 6th meeting in person. It’s completely understandable.

I do want to assure you that we strictly observe 6’ social distancing, mask wearing, and disinfection routines. Attached is a picture from our June 4th meeting, the first meeting we held since we were authorized to resume meetings, and our protocol is even stronger with the experience we have had since then. Also, a Star-Advertiser photo from our June 12th meeting overflow follows. We held our July 2nd meeting at the outdoor covered pavilion pictured by the Star-Advertiser and may decide to hold the August 6th meeting outdoors, as well.

Neighborhood Boards can only meet in public, with pre-announced agendas a week in advance. So, unfortunately, it would not be possible to meet with you as proposed.

If your policy remains in effect for the August 6th meeting, we would be delighted to try and arrange for your presentation on August 6th via ZOOM or similar application. We could display your slides live via projector screen and feed your voice commentary into the microphone.

We are eager to establish a dialog and would hope we can make the technology work for our mutual benefit. Please let me know.

Mahalo.

Aloha,

Bill

[Quoted text hidden]

IMG_2656.jpg
2696K

Gmail

Manfred Zapka <sustainabledc@gmail.com>

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (SEISPN)

Lani-Kailua Branch <lani-kailua@outdoorcircle.org> Tue, Jun 30, 2020 at 3:04 PM
To: Manfred Zapka <sustainabledc@gmail.com>
Cc: Diane Harding <hardingdiane@yahoo.com>, Pauline MacNeil <dearpauline@hotmail.com>

Aloha,

This is Diane Harding from the Lani-Kailua Outdoor Circle.

At the EIS Public Scoping Meeting for the Kapaa Light Industrial Park SEIS, we would like to see the following questions and concerns about traffic, view planes, wastewater management, air/noise/water pollution, and impacts on endangered species be discussed.

1. What effects will the project have on:
- federally listed threatened and endangered species
- traffic safety and gridlock
- water quality in Kapa'a Stream, Kawainui Marsh, Oneawa Canal and Kailua Bay
- flooding, view planes, aquatic resources
- pollution from leaching

2. How does it comply with section 404(b) guidelines of the Clean Water Act?

3. How would the project prepare for a failure of the manufactured treatment device that processes stormwater before it enters Kapa'a Stream? Are there backup systems?

4. How will water quality be measured/monitored and what steps will be taken to assure conformity to all existing laws?

5. The SEIS should provide a map of the historic location of Kapa'a Stream and the Kawainui Landfill and show where the present project will be located in relation to them.

6. The SEIS should provide an analysis of the current market need for the project in light of COVID-19, including a discussion of anticipated public access and use of the facilities.

7. The SEIS should identify the environmental impacts from septic systems as compared to connections to a sewer line.

8. The SEIS should include a “No Build” Alternative with revegetation of the site with native plants.

9. Given that the site entrance has changed, an updated traffic study should be done.

Thank you,
Diane Harding
President, Lani-Kailua Outdoor Circle
Lani-Kailua@outdoorcircle.org
[Quoted text hidden]
--
The Lani-Kailua Outdoor Circle
70 years of Clean, Green, and Beautiful for Kailua
and over 100 years for the State of Hawaii!!!
Visit us at www.LKOC.org
or www.outdoorcircle.org | facebook.com/TheOutdoorCircle | @OutdoorCircleHI

Gmail

Manfred Zapka <sustainabledc@gmail.com>

Kapa‘a Light Industrial Park (Supplemental EIS Preparation Notice) - Online Public Scoping

Teresa <tapaka53@aol.com> Thu, Jul 2, 2020 at 4:17 PM
Reply-To: Teresa <tapaka53@aol.com>
To: "leaderswisdom@gmail.com" <leaderswisdom@gmail.com>, "sustainabledc@gmail.com" <sustainabledc@gmail.com>

Will there be a recording of the meeting? It is concerning as I had several questions I hoped to be addressed. There is a KNB tonight and I wanted to provide a report to the entire committee.

Specifically, why the lower portion of the KLIP needs to be raised 11.6 feet. Is this above original grade? I know the King's have added to the area used to store their vehicles. I understand there are concerns
of using a gravity type system to filter the storm water runoff, but raising 18 acres (if I read the current proposal correctly) by almost a dozen feet is significant.

Based on the diagrams for the upper and lower portions, many new warehouse spaces are being considered. I had business in the upper KLIP last week and the transit in and around the warehouses. The alley
ways are very congested with employee vehicles, delivery trucks, and businesses positioning products outside their warehouse (such as Bali Boo and WIndward Equipment rentals). Literally the only place for customers to park is where the new upper KLIP buildings are projected.

The lower lot diagrams are 2-dimensional and do not seem to address the slope required for such a significant build. The conceptual drawings seem to indicate the buildings will reach to the edge of the available land without accounting for a slope. It would be helpful to see the horizon/topographical plans. I certainly hope the intent is not to utilize land outside the boundaries to create the slope.

I'm interested in the figures on new storm water run-off for such a large expanse of impervious addition. I cannot conceptualize how the device described in the proposal will collect and direct significant storm water away from Kapa'a Quarry road which is highly prone to flooding (and noted earlier this year). If the storm water system directs the effluent off the KLIP, how will it be transported to an appropriate outlet (aka can handle the volume of run-off without flooding another area?

I appreciate the need to have room for businesses to grow and flourish in Kailua, I'm just very unsure of the need to have such a significant build up just to create a gravity drainage system.

Lastly, another Board Member asked about plans to mitigate/control additional traffic. There is already quite a bit of truck and vehicle traffic on Kapa'a Quarry road and more businesses will mean a higher traffic load. You mentioned the in/egress will be reduced to one road. Have you considered how many more vehicles will access this area with the addition of a dozen (ish) warehouses? How will such a busy intersection be handled? 3 way stop? traffic light? There have been several very serious accidents on Kapa'a Quarry Road near the entrance to KLIP recently, resulting in the closure of the road. What strategies/responsibility will the Kings take to mitigate the increase risk due to higher vehicle traffic?

I hope you will make plans to present this project to the entire KNB in the very near future.

Thank you

Teresa Parsons
Kailua Neighborhood Board
[Quoted text hidden]

Gmail

Manfred Zapka <sustainabledc@gmail.com>

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (SEISPN)

Ann Nishida <ann.nishida@hawaiiantel.com> Tue, Jun 30, 2020 at 2:22 PM
To: Manfred Zapka <sustainabledc@gmail.com>

Aloha Mr. Zapka,

Thank you for your email below. It went through our Information Security scrubbing so I'm only reading it now. Please direct any future requests for feedback re: environmental impact notices for projects on Oahu to Kalani Andrade on our Network Development team. His email address is Kalani.Andrade@hawaiiantel.com. I have forwarded your email to him and his team. Please let me know if you have questions. Thank you.

~ Ann

Ann Nishida Fry
Senior Manager – Corporate Communications

Hawaiian Telcom

O: 808.546.1888 | C: 808.285.9289

ann.nishida@hawaiiantel.com

Hawaii's Technology Leader Hawaiian Telcom

[Quoted text hidden]

Sustainable Design
& Consulting LLC

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Appendix B:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

RESPONSES TO COMMENTS
(NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix B

Summary of Comments Received and Responses Given

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

OVERVIEW

The Draft SEIS was published in the November 23, 2020 "The Environmental Reporter" online edition.

Notices were sent to identified stakeholder groups who were thought to have a special interest in the project and a link to the report was given. Members of nine groups responded.

Appendix B presents the comments that were received in response to the distributed Draft SEIS report.

The responses to the comments were given in the following way.

- Each response letter of the agency or private entity constitutes an **individual section**.
- At the start of the section, a copy of the letter sent is presented in full.
- Following the copy of the entire letter, parts of the letter are extracted that contain a specific question or group of interrelated addressing the same subject. Typically, the questions are preceded by some type of statement that introduces the subject related to the question.
- Following the question(s), a response is provided for all comments / questions.
- In case similar questions are raised in different sections, the response in the first section is typically longer than in a following section. We noticed that several questions had the same text; in this case it was indicated that this question was answered in a preceding section.
- There are comments that ask other agencies specific questions. In this case no response was given to that comment.
- In many cases, the response provided includes a reference one of the appendices in this Final SEIS. When topics discussed in the responses include project related issues that are covered in more detail in the appendices of the Final SEIS, the responses point to the applicable appendices or figures.
- In cases where standard responses from agencies were received, a copy of the letter is produced, along with a response that acknowledges receipt of that letter.

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RESPONSES TO COMMENTS RECEIVED FROM DPP

The following letter was received from the Accepting Agency, City and County of Honolulu, Department of Planning and Permitting (5 pages)

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

EUGENE H. TAKAHASHI
ACTING DIRECTOR

January 7, 2021 2020/ED-7 (ZS)

Note: Identifiers A through M have been added to the original DPP letter to facilitate reference to the specific DPP comments.

SENT VIA EMAIL

Mr. Manfred Zapka
sustainableDC@gmail.com

Dear Mr. Zapka:

SUBJECT:	Chapter 343, Hawaii Revised Statutes Draft Supplemental Environmental Impact Statement (EIS)
Project:	Modifications to the Kapaa Light Industrial Park
Applicant:	KAPAA I, LLC and KAPAA III, LLC (John and Paul King)
Agent:	Sustainable Design & Consulting, LLC (Manfred Zapka)
Location:	905 Kalanianaole Highway - Kailua
Tax Map Keys:	4-2-015: 006, 008, and 012 (EIS)
Tax Map Keys:	4-2-015: 013 and 014 (Supplemental EIS)

The Draft Supplemental EIS for the Kapaa Light Industrial Park describes modifications to previously approved plans for the development, including modifications to the stormwater management, irrigation, and wastewater systems; the number of structures; and changes to the building area, grading, perimeter berms, and roadway access. Our comments are as follows:

- **(A)** Page 63 states that the Kapaa Stream is impaired, and that turbidity, suspended solids, and metals are the main pollutants. Page 351 states that the proposed manufactured treatment devices will remove 80 to 90 percent of total suspended solids. In the Final Supplemental EIS, please provide a table that lists and quantifies each of the stream's impairments, and describe how efficient the proposed manufactured treatment devices are at removing each pollutant.

- **(B)** Page 92 states power lines will need to be relocated. Can the power lines be relocated underground as part of the proposed development?

Mr. Manfred Zapka
January 7, 2021
Page 2

- (C) Pages 97 and 175 discuss off-street parking requirements, and page 221 discusses the parking arrangement. In the Final Supplemental EIS, please discuss compliance with the landscaping requirements for parking lots in Land Use Ordinance (LUO) Section 21-4.70.

  The parking regulations of the LUO have recently been updated. Tree boxes are now allowed if you are trying to avoid infiltration through tree wells.

- (D) Page 122 states that there are already existing rooftop solar panels and more are planned. Please quantify the amount of existing and planned solar panels. Page 352 mentions that the Applicant wants to add more solar panels and Page 378 suggests this depends on whether the local electric grid can accommodate the additional load. Ideally, the Applicant would commit to installing solar on all available rooftops and return any excess power to the grid, in order to further the renewable energy goals of the State. The Final Supplemental EIS should consider this commitment and provide Hawaiian Electric Company's official position.

- (E) Page 185 states the U.S. Fish and Wildlife Service's opposition to open detention ponds. Page 227 shows the existing 0.75-acre detention basin used to manage stormwater at the upper portion of the site. Page 229 states that 10 new warehouses will be added to the upper portion. Page 236 states that the detention basin will receive the future runoff from a 1.3-acre portion of Drainage Area 4. As part of the new development in that area, would it be possible to remove the detention basin, re-grade and re-vegetate the area with native species, and rely on manufactured treatment devices instead?

- (F) Page 237 explains that runoff from new buildings in Drainage Area 5 will infiltrate through a vegetated buffer strip. Can runoff from these areas also drain through a manufactured treatment device, possibly in conjunction with the drainage areas that feed into the detention basin mentioned in Comment 5 above?

- (G Pages 254 and 255 indicate five months of the year where about 10 percent of stormwater on the lower portion of the site bypasses the manufactured treatment devices. The Final Supplemental EIS should consider an additional detention vault, larger detention vaults, or additional manufactured treatment devices in order to reduce or eliminate the amount of stormwater that bypasses treatment.

- (H) Page 260 shows proposed buildings reaching about 50 feet in height from existing grade. The lower portion of the site is subject to the I-1 Limited Industrial District height limit of 40 feet, as measured from existing or finish grade, whichever is lower. Further, page 278 explains that the proposed warehouses will be visible from surrounding areas. The Final Supplemental EIS should consider reducing warehouse heights to mitigate visual impacts.

Mr. Manfred Zapka
January 7, 2021
Page 3

- (I) Page 339 shows that the pervious area between upper and lower portions of the site will be used as an infiltration field for wastewater effluent. Is this area also located over the former landfill? If so, the Final Supplemental EIS should consider redirecting both effluent and stormwater from that area to the stream channel through manufactured treatment devices.

- (J) Page 196 mentions the possibility of a Kawainui Marsh perimeter pathway for bikers and pedestrians, and states that 1,500 linear feet could be built on site. With the proposed modifications, would the property still have room for the future development of the bike path?

- (K) The proposed action is consistent with the Koolau Poko Sustainable Communities Plan (KPSCP).

  The KPSCP designates the Kapaa light industrial subdivision as the location where most of Koolau Poko's industrial land and building inventory is expected to be located to meet future demand. The proposed development would be considered as a light industrial use in the KPSCP's category of "Light Industrial and Extractive Industries" and is expected to conform to the language of KPSCP Section 3.6.1.5. The Section includes a policy which promotes "a re-use plan for the Kapaa quarry that includes an expansion of light industrial use, if sufficient demand can be demonstrated." Such demand was demonstrated in the 2010 market study done for the 2011 EIS, as well as an existing four percent average vacancy rate. Both the upper and lower portions of the Project site are designated "Industrial" and located within the Community Growth Boundary in Map A-2: Land Use. The proposed land use type has not changed since the initial Project was reviewed and accepted by the Department of Planning and Permitting (DPP) for the 2011 Final EIS.

- (L) Most of the guidelines for Light and Extractive Industry, outlined in KPSCP Section 3.6.2.4, are covered in the Unilateral Agreement (UA) conditions of the Zone Change, Ordinance 13-35. Compliance with UA conditions determine conformity with the KPSCP. Condition 6 of the UA requires that a "written status report to the DPP documenting its satisfaction and/or describing progress towards complying with each condition" be submitted every year by December 31st to the DPP. This condition has not been fulfilled since 2015.

  In the absence of annual report(s), please include in the Final Supplemental EIS a more detailed summary of, if and how the proposed action in the Draft Supplemental EIS meet each of the UA conditions of Ordinance 13-35, and if any approved plans need updating.

Mr. Manfred Zapka
January 7, 2021
Page 4

(L) cont. Consult with DPP's Traffic Review Branch as to whether additional updates to the fulfillment of UA Condition 1 relating to transportation may be required as a result of the proposed action in the Draft Supplemental EIS. UA Condition 2 requires a vegetated buffer zone around the Project to mitigate noise and visual impacts. Expand on how the proposed improvements, such as modifications to increase the heights and widths of the berms and proposed use of native plant species, address UA Condition 2. UA Condition 3 relating to stormwater treatment and flood control are being fulfilled by the proposed action and have triggered a need for this Supplemental EIS. The KPSCP guideline regarding harmful leachate is being addressed in the updated site development plan by sealing the surface of the site with an impervious cover. Stormwater Best Management Practices (BMPs) under the 2011 Final EIS have been replaced by stormwater BMPs which are more effective in treating stormwater runoff. Verify with the DPP Civil Engineering Branch for consistency with UA Condition 3. Finally, the UA condition requiring lighting impact mitigation has been approved by the DPP and the Department of Land and Natural Resources (DLNR), addressing KPSCP guidelines regarding full-shielded lighting that balances the needs for public safety, security, energy conservation, and wildlife protection. Please indicate how the proposed additional warehouse structures and tenants will comply with the exterior lighting plans approved by DLNR in 2014 and 2016, and include documentation of consultation with DLNR as needed.

- **(M)** The Applicant should update the following documents as it pertains to the proposed modifications and timing of the Kapaa Light Industrial Park:

  a Timeline;

  b Construction Management Plan;

  c Traffic Management Plan;

  d Traffic Impact Analysis Report, in coordination with State Department of Transportation; and

  e "Proposed Scope of Roadway Improvement Technical Information"

Mr. Manfred Zapka
January 7, 2021
Page 5

Should you have any questions, please contact Zack Stoddard, of our Land Use Approval Branch, at (808) 768-8019, or zachary.stoddard@honolulu.gov.

Very truly yours,

FOR Eugene H. Takahashi
Acting Director

Response to DPP comment (A)

• (A)	Page 63 states that the Kapaa Stream is impaired, and that turbidity, suspended solids, and metals are the main pollutants. Page 351 states that the proposed manufactured treatment devices will remove 80 to 90 percent of total suspended solids. In the Final Supplemental EIS, please provide a table that lists and quantifies each of the stream's impairments, and describe how efficient the proposed manufactured treatment devices are at removing each pollutant.

Removal efficiency of the type of manufactured treatment device used:

The manufactured treatment device (MTD) type that is already in use at the Upper portion of the project site and planned for implementation in the Lower portion is a filtration MTD. The particular MTD used at the project site is the Bio Clean Kraken™ Filter unit. If there are changes in the type of MTD offered from different vendors, a system with equivalent treatment performance would be used.

This Kraken MTD has been approved by the DPP for use as an Alternative Compliance BMP.

The approval of the DPP is based on whether the MTD has passed test based on either of two test protocols:

- Certification in accordance with the Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE) test protocol.
- Certification in accordance with New Jersey Department of Environmental Protection (NJDEP) test protocol.

Both test protocols are widely used as the basis for local certification of MTDs.

The Kraken MTD Filter unit utilizes membrane filtration, this ensures a high level of removal for not only TSS, but also metals, trash, nutrients, and hydrocarbons. The Kraken MTD Filter unit has received NJDEP and TAPE certifications for TSS removal rate at 80% and 89%, respectively. Table A.1 shows an excerpt of a list that DPP has published to endorse the MTD "Kraken".

Table A.2 shows a list of storm water pollution removal efficacy of the Kraken filtration MTD unit as tested under the TAPE protocol.

Table A.1: Excerpt of DPP table endorsing the Kraken MTD unit

Description in DPP table	Performance
Manufacturer	Bio Clean Environmental Services, Inc.
Product	The Kraken
Treatment type	Basic
Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE)	
Treatment type	Basic
Additional Treatment Type	Phosphorus
Use level	Conditional Use Level
New Jersey Department of Environmental Protection (NJDEP)	
Certified TSS Removal Rate	80%
City and County of Honolulu	
Device Type	Alternative Compliance BMP

Table A.2: Pollutant removal efficiency of the Kraken MTD in accordance with TAPE protocol

Pollutant type	Average influent concentration mg/l	Average effluent concentration mg/l	Removal efficacy
Total Suspended Solids	73.1	7.0	89%
Total Phosphorus	0.151	0.034	72%
Suspended Solids Conc.	151.3	6.9	89%
Nitrogen (TKN)	1.5	1.0	31%
Fecal Coliform	692	355	60%
Motor Oil	4.6	0.7	81%
Total Zinc	0.158	0.054	54%
Total Copper	0.042	0.017	52%
Diesel Range Organics	1.2	0.4	65%

Kapa'a Stream - 303-listed Stream:

The Kapa'a Stream Is a "303-listed" inland water as defined under the Clean water Act (CWA) §303(d).

The background of the listing of Kapa'a Stream can be found in the Department of Health publication "The 2018 STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress, Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)". The reported values for the Kapa'a Stream (Oahu) are found in Appendix B – 15 in this document. Table A.3 shows the values for the Kapa'a Stream.

Table A.3: Excerpt of the 2018 State of Hawaii WQ Monitoring and Assessment

Description in the table	Reported values
Assessed Water Body	Kapa'a Stream
Water Body Type	Stream
Water Body ID	3-2-13-Kapaa
TN	V_T
NO3+NO2	V
TP	V_T
Turbidity	V
TSS	V_T
Other Pollutants	Metals, Lead
Category	3,4a,5
TMDL Priority	TMDLs approved, 2007, (TN, TP & TSS)

The entries in Table A.3 are defined as follows:

V = visual listing from 2001 - 2004
VT = visual listing from 2001 - 2004 (TMDL approved for parameter)
3 = not enough data to evaluate
4a = TMDL approved
5 = at least one use not attained, TMDL needed

In accordance with Table A.2 TMDL priorities in TN,TP and TSS have the following removal efficiencies."
TN = 31% removal
TP = 72% removal
TSS = 89% removal

Other pollutants could be identified as an average of about 50% removal.

Response to DPP comment (B)

• **(B)**	Page 92 states power lines will need to be relocated. Can the power lines be relocated underground as part of the proposed development?

Power lines that supply the Kapa'a Light Industrial Park (KLIP) pass over the Lower site. These power lines will have to be moved to make place for the development in the Lower site.

The new alignment of the power lines will pass outside the Northern and Eastern site perimeter over a distance of about 2,000 feet. This means that the relocated power lines will be placed outside the earth berms with the vegetated buffer zone on them.

The power line relocation will be carried out by HECO and communication between the owner and operator of KLIP (Applicant) and HECO is ongoing.

Details of the power line relocation project are described in **Appendix L of this FSEIS document**. The Appendix M describes the expected impacts of the power line relocation and proposed impact mitigation measures.

The issue of locating the relocated power lines underground can be answered in two aspects:

1. Power lines will be placed underground inside the project site to bring power to the buildings.
2. The power line relocation outside the project site could be located both above and below ground. Communications with HECO suggest that placing the power line below ground for the new addition of about 2,000 feet in length of the rerouting would be expensive and not warranted. The fact was raised by HECO that underground power lines would need to be installed in saturated soil, creating associated risks. Furthermore, prior to the start of the about 2,000 feet of relocated power line, and after the end of the relocated section of the power line, the conductors are installed above ground.

Response to DPP comment (C)

• (C)	Pages 97 and 175 discuss off-street parking requirements, and page 221 discusses the parking arrangement. In the Final Supplemental EIS, please discuss compliance with the landscaping requirements for parking lots in Land Use Ordinance (LUO) Section 21-4.70. The parking regulations of the LUO have recently been updated. Tree boxes are now allowed if you are trying to avoid infiltration through tree wells.

The off-street parking for the project site is described in **Appendix F of this FSEIS document**.

The Revised Ordinances of Honolulu (ROH) require the planting of trees on parking lots. Revisions of ROH 21 which apply to parking have been recently changed. This has affected the way off-street parking is depicted in the development plans.

While the required number of parking spaces per footprint of warehouse has been decreased, new regulations have been added for landscaping.

The applicable section of the new regulations that relate to landscaping are as follows:

> *(2) To provide shade in surface parking lots and minimize visibility of paved surfaces, parking lots with more than five parking spaces must provide one canopy form tree, a minimum of two-inch caliper, for every six parking spaces or major fraction thereof, or one canopy form tree of six-inch caliper or more for every 12 parking spaces or major fraction thereof (see Figure 21-6.2). Each tree must be in a planting area or tree well a minimum of 16 square feet in area for 2-inch caliper trees, or a minimum of 25 square feet in area for 6-inch caliper trees. The minimum width of an area for a tree is three feet. Hedges and other landscape elements, including planter boxes over six inches in height, are not permitted within the overhang space of the parking spaces. Trees must be sited to evenly distribute shade throughout the parking lot. As an alternative to the above-described planter areas for trees, a tree box specifically designed to treat stormwater runoff may be used on a one-for one basis in place of the landscaped area. Tree boxes must be approved for compliance with the rules related to stormwater quality.*

For the proposed site development, the trees would not be used for storm water treatment. Storm water runoff would be excluded from entering the tree planted areas. This condition is necessary so that no larger quantities of storm water runoff from adjacent paved areas would enter the pervious planted areas and percolate down to the landfill body. As a required site development condition, infiltration of sizable quantities of water at the site must be avoided. Infiltration of quantities of storm water into the landfill body must be avoided so that no potentially harmful leachate could be generated.

In lieu of tree boxes, special engineered soil will be used for the trees at the Lower site. **Appendix F of this Final SEIS** describes benefits of using the selected engineered soil, which provides structural support for the traffic areas and provides an appropriate soil that is conducive to tree growth.

Response to DPP comment (D)

• (D)	Page 122 states that there are already existing rooftop solar panels and more are planned. Please quantify the amount of existing and planned solar panels. Page 352 mentions that the Applicant wants to add more solar panels and Page 378 suggests this depends on whether the local electric grid can accommodate the additional load. Ideally, the Applicant would commit to installing solar on all available rooftops and return any excess power to the grid, in order to further the renewable energy goals of the State. The Final Supplemental EIS should consider this commitment and provide Hawaiian Electric Company's official position.

The installation of rooftop solar panels (PV) at the Kapa'a Light Industrial Park started in 2010. By 2013 about 520 kw were installed on four warehouses. In 2015 another 130 kW were added on one more warehouse. At the present approximately 650 kW are installed on five warehouses within the Upper site, with a total roof area with of solar panels of 43,000 sqft.

Using data provided from the US Energy Information Administration (EIS) and US Environmental Administration (EPA) the present levels of power installed, energy generated, and electricity energy consumed for the newer buildings in the Upper site are determined and reported in Table D.1. Using the EPA data assumptions, it is estimated that approximately 50% of all energy for the new building in the Upper site can be provided.

Table D.1: Estimates of PV power and energy generation (All values are rounded and based on unit capacities published by the EPA)

Design data for existing Upper site:		
Footprint of new buildings in Upper site	313,000	Sqft
PV panels currently installed (area)	43,000	Sqft (on five larger bldgs.)
PV panels currently installed (power generation)	650	kW
PV panels currently installed (energy generation)	950	MWh per year
Energy demand of all new buildings in Upper site	1,900	MWh per year
Current energy generation - % of demand	50%	
Amount of roof area required to supply the new buildings in the Upper site	86,000	Sqft of roof area

Note: Numbers are rounded

The Applicant plans to install enough rooftop solar panels (PV) to provide the energy demand of the entire KLIP at full build-out, if allowed under the governing jurisdiction for PV power generation. The full build-out warehouse footprint would be approximately 865,000 sqft. Using the EPA assumptions, the energy demand and required amount of PV is shown in Table D.2.

Table D.2: Estimated energy demand and required area of PV installation at full build-out

Planning for future full build-out Upper and Lower site (for Upper site only newer buildings):		
Total warehouse footprint at full build-out	865,000	sqft
Total energy demand for all warehouses in KLIP at full build-out (total of 865,000 sqft)	5,200	MWh/a
Potential power generation of all buildings with PV on all available roof areas (buildings with a total footprint of 686,000 sqft.)	9,200	kW
Potential energy generation of all buildings with PV on available roof areas (buildings with a total footprint of 686,000 sqft.)	13,500	MWh/a
Required area with installed PV to provide the energy demand of the entire KLIP at full build-out	240,000	sqft
Potential amount of net energy that could be supplied off site	8,300	MWh/a

The numbers presented in Table D.2 suggest that the installation of PV on about 40% of available roof tops of newer buildings could provide the total energy demand of the entire Kapa'a Light Industrial Park. The total demand includes of those older buildings without PV on the roof. This could make the KLIP a net zero building warehouse development.

With the potentially generated excess energy that PV could generate if all building roofs in KLIP were equipped with PV, an approximate 1,100 households (assuming an average energy demand of a Hawaii household) could potentially be supplied with energy generated by the KLIP. With an approximate 12,500 households in Kailua, the equivalent of about 9% of Kailua households could potentially be supplied. (source: number of households in Kailua 12,500 as per US Census (source current website).

The potential plans of installing PV more on rooftops in the KLIP was discussed with HECO. Opportunities and limitations for the installation of additional PV capacities at the KLIP are as follows:

- Under the present regulations the Feed-in Tariff (FIT) program was discontinued in 2017, as no more FIT applications were accepted.
- New PV capacities could be installed under the Customer Grid Supply program which allows the installation of PV up to 100 kW of total output capacity. The installed PV capacity must be connected to one electric meter.
- The Applicant has the option of installing the 100-kW maximum capacity that feeds into one meter. Several tenants could be connected to the meter. Besides charging electricity costs per square foot of leased space, tenants could also submeter to determine the actual demand and pay accordingly.
- With the large amount of required power to supply the entire KLIP and the maximum 100kW output capacity per meter, the customer grid supply program could face organizational difficulties.
- A more feasible way would be to use so-called Master meter agreements, where large facilities have a small number of meters for their sizable demand.

Response to DPP comment (E)

• (E)	Page 185 states the U.S. Fish and Wildlife Service's opposition to open detention ponds. Page 227 shows the existing 0.75-acre detention basin used to manage stormwater at the upper portion of the site. Page 229 states that 10 new warehouses will be added to the upper portion. Page 236 states that the detention basin will receive the future runoff from a 1.3-acre portion of Drainage Area 4. As part of the new development in that area, would it be possible to remove the detention basin, re-grade and re-vegetate the area with native species, and rely on manufactured treatment devices instead?

Description of the existing infiltration and detention basin:

In 2011 the US Fish and Wildlife Service stated concerns about installing detention basins with free water surfaces that could attract listed water birds. These water birds could then be subjected to a greater predator risks. Consequently, no detention basins with free surfaces are planned for the new site development, and all detention volumes will be underground.

The existing 0.7-acre infiltration and detention basin in the Upper portion of the site has a dense vegetation cover. There is a vegetated buffer strip between traffic areas and the basin, assuring a good separation and avoidance of water birds being attracted to areas with traffic. Figure E.1 shows a picture taken of the existing infiltration and detention basin from the Kapa'a Quarry Place roadway.

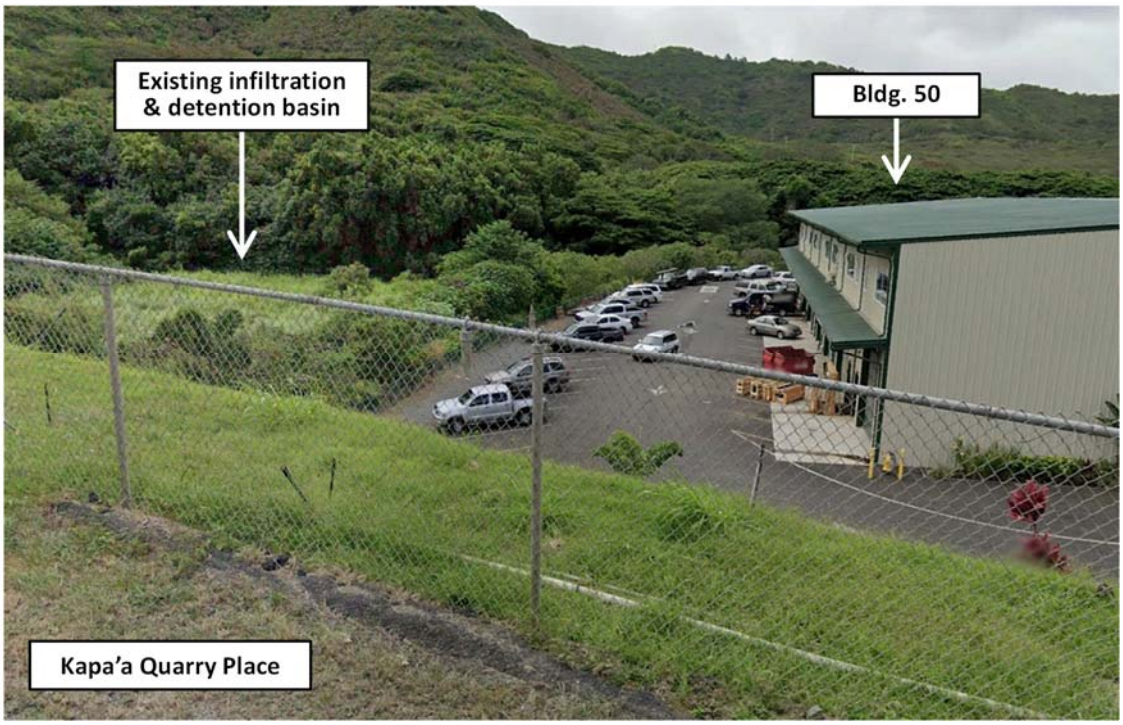


Figure E1: Figure 6.6.3.16 of Draft SEIS
View N: From the South-West bound Kapa'a Quarry Place towards the Project site

A recently submitted and accepted Storm Water Strategic Plan investigated the feasibility of adding a 1.3-acre drainage area to the 0.7-acre existing detention and infiltration basin. The investigation concluded that the existing 0.7-acre basin could accommodate the added drainage, based on the BMP sizing worksheet provided by the DPP. The existing vegetated 0.7-acre infiltration and detention basin provides an effective treatment of runoff from the area.

The existing 0.7-acre infiltration and detention basin has the type of vegetation which can be found in the Kapa'a Stream corridor. Clearing the basin and replanting it with different vegetation would add short term impacts to the stream corridor in form of increased soil erosion inside the basin and subsequent deposition of soil in the stream bed.

Summarizing, it would be technically feasible to remove the existing vegetation and replace it with new vegetation. But the benefits of such vegetation change are expected to be minor and would not be justified by exposing a large area adjacent to the stream for a period and creating the likelihood of significant erosion and subsequent soil deposition in the stream bed.

Feasibility of installing a MTD upstream of the existing infiltration and detention basin:

Adding the type of DPP-endorsed MTD to the storm water system discharge would be technically feasible. A MTD would add in the removal of pollutant from the discharged storm water. The type of MTD would be a filtration device with a high removal rate of pollutants of more than 80% of Total Suspended Solids (TSS).

A comprehensive source control program has been implemented on the areas that drain into the existing infiltration and detention basin. The source control measures are required under the NPDES No Exposure Certification for the drainage areas. Effective source control measures lower the entrainment and transport of pollutant in the storm water runoff from the drainage area upstream of the basin. This lowers the number and Volume of pollutants in the discharge to the basin.

Installing the type of filtration MTD which is already in use in and planned for other parts of the KLIP requires a certain hydraulic head to overcome hydraulic flow losses and elevation losses. Hydraulic losses include pipe losses, minor losses, and the elevation loss inside the MTD. A detailed study of the available elevation difference between the paved drainage area and the basin would be required to determine if sufficient hydraulic flow energy were available to maintain flow through an MTD. An MTD, however, is typically installed in a bypass configuration. This means that a MTD typically only treats storm water runoff up to a certain flow rate, which is defined as the water quality flow rate. Flows during heavy rain events bypass the MTD.

Summarizing, it is deemed that installing a MTD upstream of the existing infiltration and detention basin would not significantly benefit water treatment at the project site. The installation of a MTD is required when LID storm water treatment strategies cannot be installed. But in the existing configuration with the 0.7-acre infiltration and detention basin, an effective LID strategy is already available. Notwithstanding the benefits of an MTD, the hydraulic configuration of the drainage system might not

provide sufficient elevation differential between basin and drainage area to overcome hydraulic head losses, thus the flow rate through the MTD might be low.

Response to DPP comment (F)

• (F)	Page 237 explains that runoff from new buildings in Drainage Area 5 will infiltrate through a vegetated buffer strip. Can runoff from these areas also drain through a manufactured treatment device, possibly in conjunction with the drainage areas that feed into the detention basin mentioned in Comment 5 above?

The vegetated buffer strips used as a LID treatment for Drainage areas 5:

The drainage area 5 is described in Section 6.2.3 of the Draft SEIS. Figure F.1 and F.2 illustrate the flow and water quality treatment processes of drainage area, respectively. The identifiers A though G are used in both figures and Table F.1.

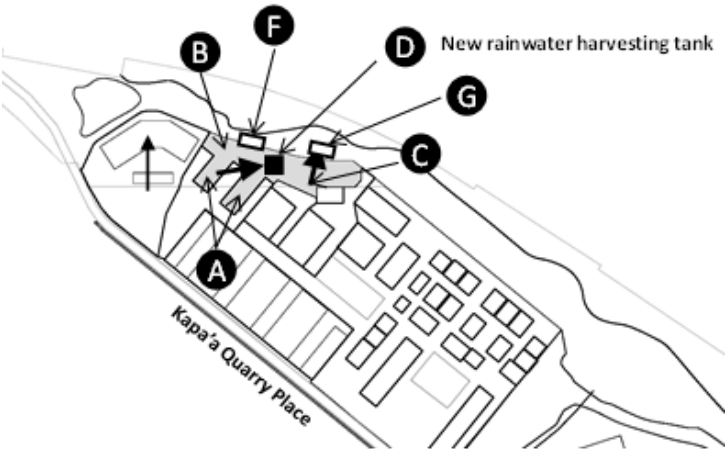


Figure F.1: Drainage area 5

Drainage area 5 drains to toward two vegetated buffer strips upstream of the site perimeter

Figure 6.2.3.11 of the Draft SEIS

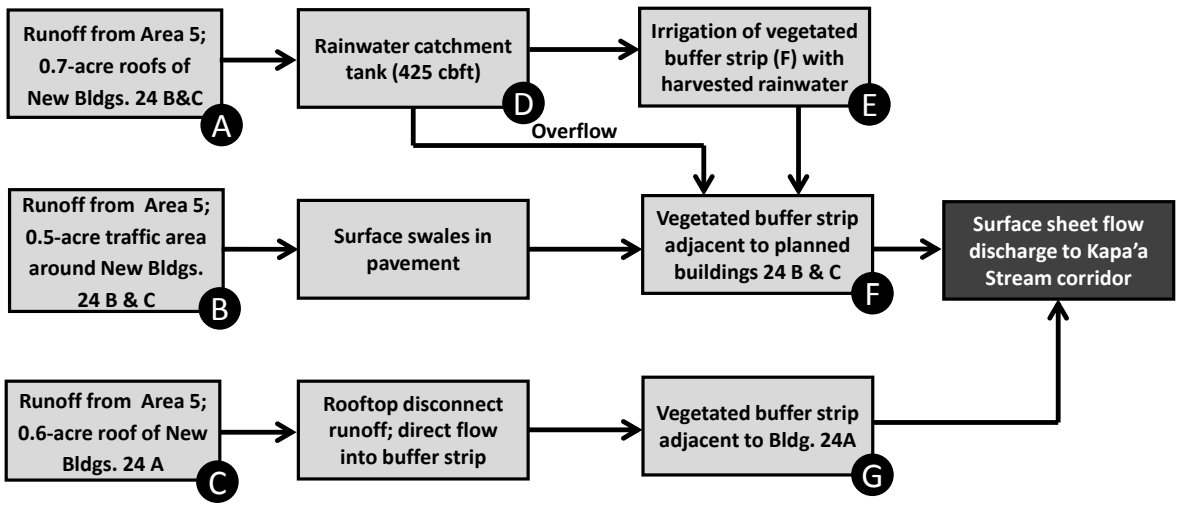


Figure F.2: Flow diagram of the stormwater runoff from drainage area 5 (Figure 6.2.3.10 of the Draft SEIS)

Table F.1: Annotations used in Figure F.1 and F.2

Identifier	Description of the stormwater treatment approach
A	The portion (A) of Drainage area 5 is the 0.7-acre roof drainage area of the New building 24 B and C. The roof run off is disconnected from the surface runoff from the traffic areas and is conveyed to a new 425-cbft rainwater harvesting tank. The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F).
B	The portion (B) of Drainage area 5 is the drainage of the 0.5-acre traffic area around the two planned warehouses Buildings 24 B and C. The runoff flows though surface swales in the pavement to the vegetated buffer strip.
C	The portion (C) of Drainage area 5 is the drainage of the 0.6-acre roof of the new building 24A. traffic area around the two planned warehouses Buildings 24 B and C. The roof runoff flows directly into the 150-foot vegetated buffer strip section that is adjacent to building 24A.
D	The roof runoff from the planned buildings 24 B and C is disconnected from the traffic area runoff and flows directly into a 425-cbft rainwater catchment tank. The overflow of the irrigation tank is conveyed through the vegetated buffer strip.
E	The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F) which is located adjacent to the planned buildings 24 B and C (F)
F	The 1,500-sqft vegetated buffer strip is located adjacent to the planned buildings 24B and C. It receives the combined runoff from the portions (A) and (B) of Area 5.
G	The 1,000-sqft vegetated buffer strip is located adjacent to the planned buildings 24A. The buffer strip receives the roof runoff of Bldg. 24A.

The storm water plan for the 1.8-acre drainage area 5 will have series of three vegetated buffer strips. Of the 1.8-acre, 1.3 acres will receive runoff from the warehouse roofs of buildings 24 A, B and C. A recognized technique in LID storm water treatment is to disconnect rooftop runoff from runoff of other area, such as traffic and parking areas. Runoff from roof top areas has significantly less polluted than runoff from areas such as traffic areas.

Drainage from the 0.7-acre roof area of buildings 24 B and C will flow into a rainwater harvesting tank. The harvested rainwater will be used to irrigate the major portion of the two collected vegetated buffer strips. Irrigation water will be applied as needed through dosed sprinkler distribution and only little irrigation water will infiltrate. Lowering the amount of infiltration into the landfill body is a declared design objective.

The remaining 0.5 acre of drainage area 5 will paved and will also flow through the vegetated buffer strip for treatment. Rainwater harvesting will not occur from this traffic area.

A vegetated buffer strip with the dimension of the strip selected for drainage area 5 has the capacity to be a LID storm water treatment element for the 1.8-acre drainage area 5, based on the DPP BMP sizing worksheet. MTDs are required as alternative treatment devices when LID treatment strategies are not feasible at the site. But the vegetated buffe strip can serve as a sufficient LID BMP.

The treatment process of a vegetated buffer strip has two components:

1. Infiltration into the permeable soil of the vegetated buffer strip.
2. Surface sheet flow through the vegetation, which removes quantities of suspended and dissolved pollutant from the storm water runoff.

To 1.: The first treatment process, infiltration is not desired at the site, since infiltration of larger amounts of storm water into the existing landfill body should be avoided.

To 2: The second component, sheet flow through vegetation, is considered the main treatment process components at the site.

Feasibility of Installing MTD for Drainage Area 5:

There are two possible scenarios of installing a MTD for the drainage area 5:

Scenario 1. Installing the MTD adjacent to the new buildings 24 B and C and conveying the runoff from drainage area 5 through this MTD

Scenario 2. Conveying the entire drainage from the 1.8-acre drainage area to a MTD upstream of the existing 0.7-acre infiltration and detention basin.

<u>Scenario 1:</u> Installing a MTD downstream of drainage area 5 would entail a significant excavation near sloped site perimeter. This would most likely entail the construction of retaining walls and other structural support for the MTD, the peak flow bypass and the armored outfall on the sloped site perimeter. The bypass of the MTD is the discharge overflow during heavy storm events. The discharge

from the MTD and the bypass flow would be conveyed over an armored outfall down the sloped perimeter. If the vegetated buffer strip would be used, a shallow about 0.25-inch-thick sheet flow would form over the entire length of the vegetated buffer strip.

Scenario 2: As was discussed under Section E a MTD unit could be installed upstream of the existing 0.7-acre infiltration and detention basins. But Section E also pointed out that a MTD would not add significant impact mitigation because of the LID storm water treatment and management by means of the 0.7-acre existing infiltration and detention basin. The existing infiltration and detention basin can accommodate the 1.3-acre traffic area around Buildings 24 B and C under the LID sizing worksheet. But the additional runoff from the 1.8-acre of drainage area 5 could not be accommodated under LID treatment.

Therefore, installing a MTD unit for water quality treatment of drainage area 5 would not provide tangible benefits.

Response to DPP comment (G)

• (G)	Pages 254 and 255 indicate five months of the year where about 10 percent of stormwater on the lower portion of the site bypasses the manufactured treatment devices. The Final Supplemental EIS should consider an additional detention vault, larger detention vaults, or additional manufactured treatment devices in order to reduce or eliminate the amount of stormwater that bypasses treatment.

Storm water drainage areas and treatment within the Lower site.

Following the DPP comments about adding detention vaults, larger detention vaults or adding MTDs the following changes were made to the storm water treatment and management approach of the Lower site:

1. One drainage area was added to the previous three drainage areas, bringing the total number of drainage areas up to four. (Figure G.1 shows the four drainage areas)
2. One MTD was added, therefore there will be four instead of four MTD units. One MTD unit for every drainage area. (Figure G.1 shows the four MTD located at the Northern site perimeter)
3. The holding capacity of the detention vaults have been increased. The downward site slope towards the Eastern site perimeter implies that more debris deposition will occur within the Eastern drainage areas. Consequently, more detention volume has been added to the Eastern drainage areas.

Figure G.1 illustrates the four drain areas. Each of the drainage areas are served by one main drainpipe and treatment and management adjacent to the Northern site perimeter. The main four drainpipes are running from South to North. A detailed description of the updated storm water treatment and management system in the Lower site is presented in **Appendix C of this Final SEIS.**

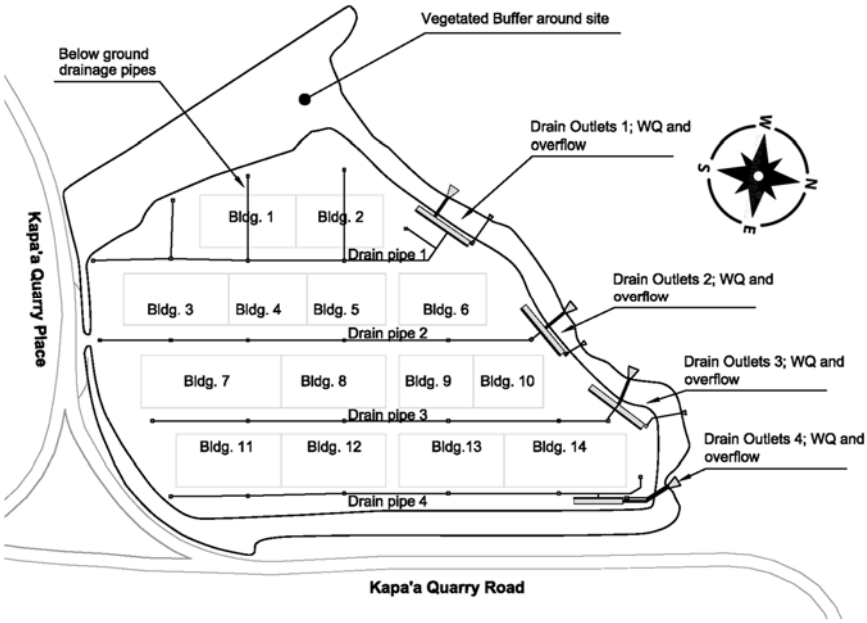


Figure G1: Elements of the storm water drainage and treatment system of the Lower site

The four drainage areas are arranged in a South to North direction. Each treatment system for the four dranage areas are located at the terminuns of the drainpipes. Each treatment and management systems includes vegetated swales, one detention vault, one MTD unit, one overflow system that bypasses the detention vaults and a armored outfall.

The benefits of adding one drainage area with the associate treatment train in the Lower site has the following benefits:

- The storm water discharge from the Lower site to the Kapa'a Stream corridor is more distributed from four versus three drainage outfalls. This reduces the point runoff discharges and therefore mitigates stream bed erosion occurrences in the Kapa'a Stream corridor
- The detention volume is increased relative to the previously selected detention volumes.
- By increasing the detention vault volumes less storm water runoff bypasses the detention vaults and therefore the MTD unit of the treatment train in the drainage area.
- The four drainage areas provide more flexibility during the site development.

Summarizing, impacts from storm water discharge to the Kapa'a Stream corridor are reduced by adding one drainage area, one treatment train associated with added drainage area, and increasing the detention vault volume.

Response to DPP comment (H)

• (H)	Page 260 shows proposed buildings reaching about 50 feet in height from existing grade. The lower portion of the site is subject to the I-1 Limited Industrial District height limit of 40 feet, as measured from existing or finish grade, whichever is lower. Further, page 278 explains that the proposed warehouses will be visible from surrounding areas. The Final Supplemental EIS should consider reducing warehouse heights to mitigate visual impacts.

Response: This comment by DPP stated that selected buildings planned to be built on the proposed finish grade in the lower portion of the project site (Lower site), would exceed the 40-foot height limit above the existing grade allowed in the I-1 (Limited Industrial) zoned land. In accordance with the Revised Ordinances of Honolulu (ROH) the 40-foot height limit is measured from the existing grade if the site has received fill. This is the case for the Lower site.

The DPP comments indicated that proposed buildings are reaching around 50 feet in height from existing grade and are therefore exceeding the 40-foot limit measured from the existing grade.

Appendix D of this Final SEIS shows that the proposed finish grade will be required to install the comprehensive storm water treatment and management system. Appendix D shows that the applicable 40-foot height limit delineated in ROH chapter 21 needs to measure the building heights in the Lower site from the proposed finish grade and not the existing grade. The justification of measuring the 40-foot building height limit from the finished grade is the application of ROH 21 Article 4. General Development Standards, Section 21.-4.60 Heights. The quoted text is as follows:

Sec. 21-4.60 Heights.

(a) All structures shall fall within a building height envelope at a height specified by this chapter or as specified on the zoning maps. Exceptions are specified under subsection (c), and others may be specified under special districts.

(b) The building height envelope shall run parallel to existing or finish grade, whichever is lower (see Figure 21-4.3), ***except where finish grade is higher than existing grade to meet city construction standards*** *for driveways, roadways,* ***drainage****, sewerage, and other infrastructure requirements, or to meet conditions of permits approved under the provisions of this chapter. In these cases, height* ***shall be measured from finish grade****.*

Figure H.1 shows the layout of the Lower site with an indication of axes for the four drainpipes. The cross-sections of the axes provide indications of the existing and finish grade elevations. As an example, the cross section at drainpipe No. 2 is shown in Figure H.2. Figure H.2 shows to the existing and finish grade as well as buildings No. 3 through 6. In Figure H.2 the buildings are shown with a preliminary height of 35 feet, which is lower than the allowed 40 feet.

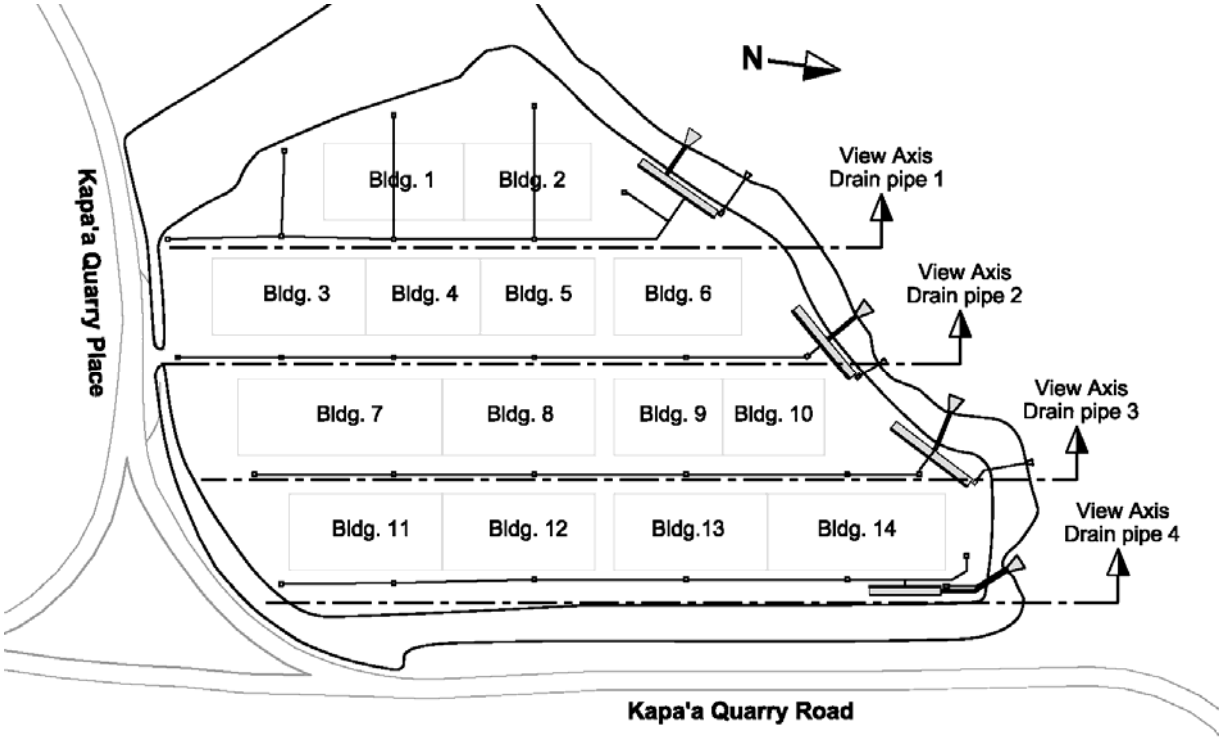


Figure H.1: Locations of the elevation section (source Figure 2.4 of Appendix D of this FSEIS)

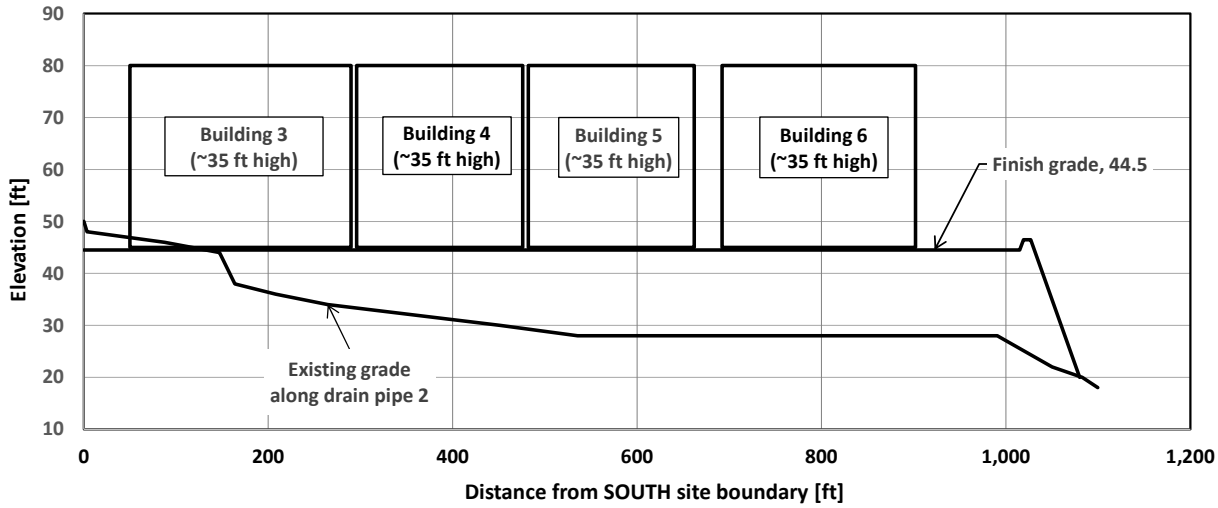


Figure H.2: Elevation section with existing and proposed finish grade for the View Axis of Drainpipe 2 (source Figure 2.4 of Appendix D of this FSEIS)

Figure H.3 shows the schematics of the storm water treatment train which will be used for each of the four drainage areas in the Lower site. Water enters the drainpipes and flows to the storm water treatment system at the Northern site perimeter, which includes a vegetated buffer strip, a detention vault, a MTD unit and armored outfalls.

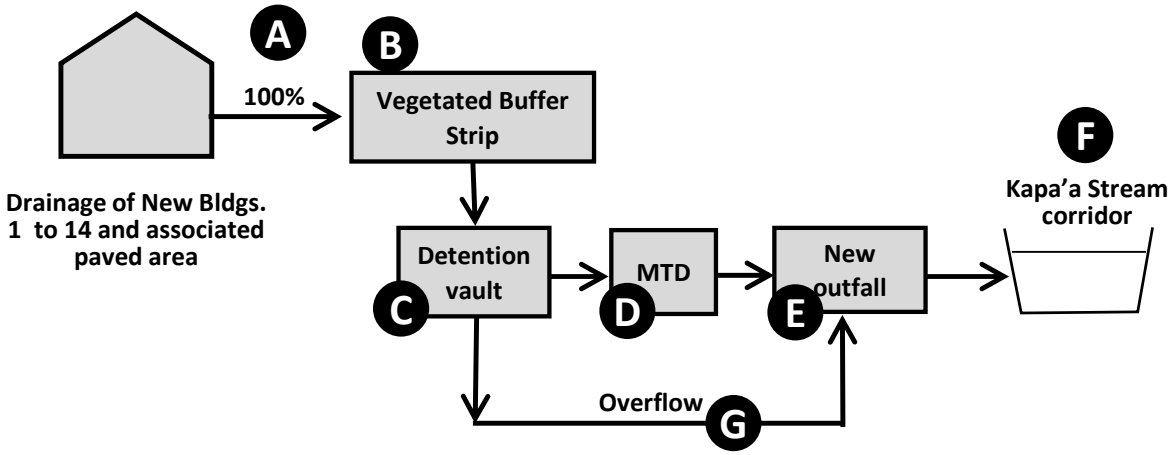


Figure H.3: Strom water treatment train used for all 4 drainage areas in the Lower site (source Appendix D Figure 3.1)

Table H.1: Description of the treatment train for each of the four drainage areas in the Lower site

ID	Description of components of treatment train
(A)	One hundred percent (100%) of the storm water runoff from the drainage area is captured in the drainpipes. The drainpipe starts that the first drain inlet close to the Southern site perimeter and ends at the inlet to the treatment facilities which is located at the Northern site perimeter. Several drain inlets along the length of the drainpipe collect runoff and feed the runoff into the drainpipe. All drain inlets have debris collecting screen which hold back coarse settleable and floatable debris that passes through the inlet grating. The drainpipes will have a certain slope to provide the required hydraulic flow energy.
(B)	The first treatment component is the vegetated buffer strip. All the runoff that exists the drainpipe will flow through the vegetated buffer strip, where initial treatment of runoff occurs.
(C)	After passing through the vegetated buffer zone the runoff enters below ground detention vaults. The detention vaults collect and store the runoff volume. When the detention vault is filled, the flow is diverted to the overflow pipe (G)
(D)	The detained water in the detention vaults is released over a longer period, typically 24 to 36 hours, to shave off peak flow rates. The released flow passes through the manufactured treatment device (MTD). The type of MTD unit used at the project site is a filtration unit, which requires a certain hydraulic head to force the water through the filter elements.
(E)	There are two types of outfalls: 1. A small outfall structure serves the flow that is released from the MTD. This outfall is referred to as the WQ outfall.

Table H.1: Description of the treatment train for each of the four drainage areas in the Lower site

ID	Description of components of treatment train
	2. A larger outfall structure ("peak outfall") serves the overflow of the detention vault. This outfall will have to accommodate a larger flow rate that corresponds to the assumed peak flow rate (e.g., the 50-year storm event). Since the flow rate is large, energy dissipation devices and a riprapped distribution area will be incorporated into the outfall structure. The WQ outfall will be located at a lower elevation than the peak outfall structure.
(F)	The water that is released to the Kapa'a Stream corridor will typically be distributed on vegetated and permeable land upstream of the stream bed, and not directly into the stream bed. Therefore, a portion of the water released into the Kapa'a Stream corridor would infiltrate and not directly add to the flow in the stream.
(G)	The overflow of the detention vault bypasses the detention vaults and the MTD units. The overflow is carrying flow during peak flow events.

The flow pathway causes a series of hydraulic losses. To overcome these losses, sufficient elevation differentials must be provided between the most distance drain inlet and the location where the runoff is discharged to the existing grade in the Kapa'a Steam corridor. As an example, for all four drainpipes, Figure H.4 illustrates and quantifies all hydraulic flow losses that are encountered in drainage area 2.

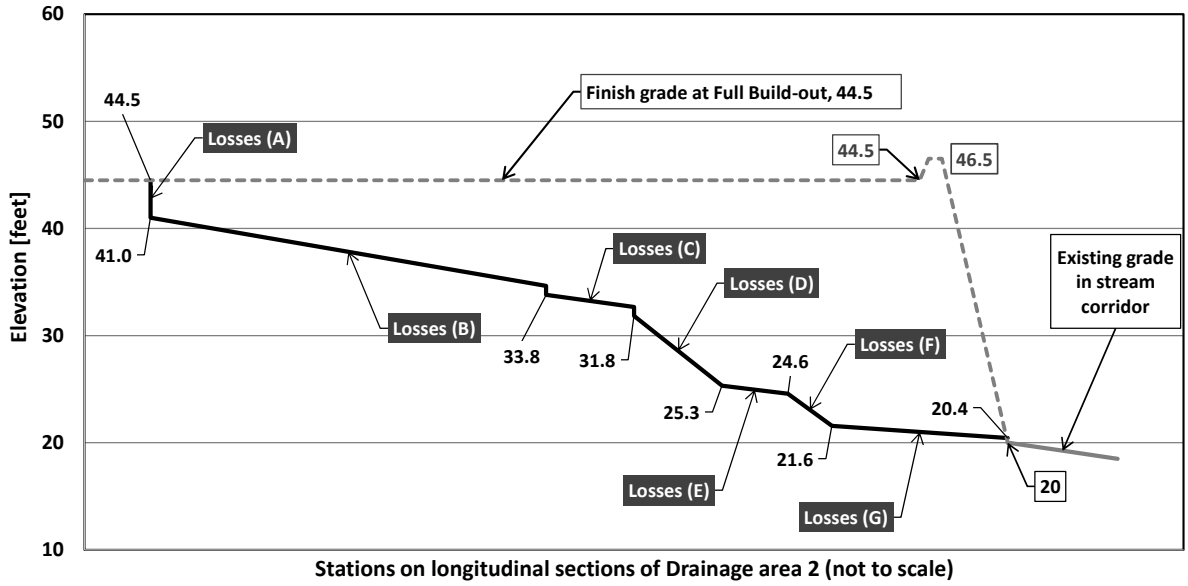


Figure H.4: Hydraulic flow losses in drainage and treatment system for Drainage Area 2 (source Appendix D, Figure 4.2)

Using drainage area 2, as an example, Figure H.5 illustrates that sufficient elevation to overcome all hydraulic losses can only be achieved when the finish grade is elevated above the existing grade.

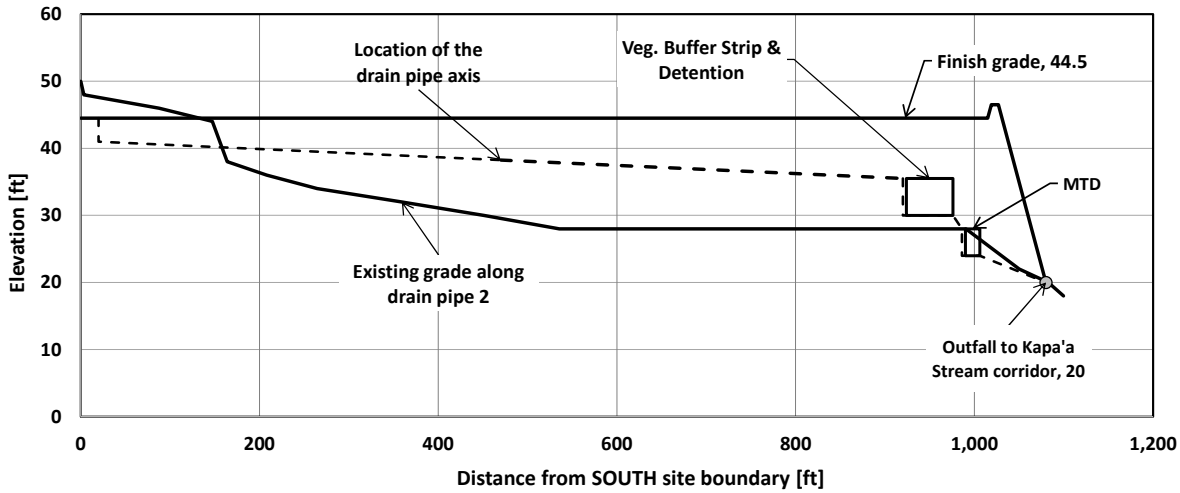


Figure H.5: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 2 (source Appendix D, Figure 5.2)

Minimizing Visual Impact

DPP comments stated the necessity to address mitigating the visual impact of buildings.

Appendix G of the Final SEIS describes strategies of visual impact mitigation which will be used in the development of the Lower site. These mitigation strategies are described in Appendix G of this Final SEIS.

Two main visual impact mitigation strategies to mitigate view on the site are (1) views from adjacent roadways and (2) views from longer distances. These visual mitigation strategies use different measures.

<u>Visual impact from adjacent roadways</u> will be mitigated by the new earth berms at the site perimeter. Trees and shrubs will be added to the top of berms to provide an effective visual screen. **Appendix G of the Final SEIS** shows the locations of representative cross sections around the Lower site where lines of sight from passing observers on adjacent roadways to buildings with the Lower sight were evaluated. Figure H.6 shows a map with locations of these cross sections, where the cross-section D (Section D) is indicated as an example.

The Section D is shown in Figure H.7 and H.8, without and with trees and shrubs at the top of the earth berms, respectively. The Section D gives an idea about the lateral view situation. Figure H.7 illustrates that the lines of sight are intersecting with façades of buildings closest to the Eastern project site boundary. This means that the upper portions of the facades of these buildings are visible. Figure H.8 shows that given the same perspective these buildings would be totally shielded if trees, of the indicated heights, created an effective vegetative screen.

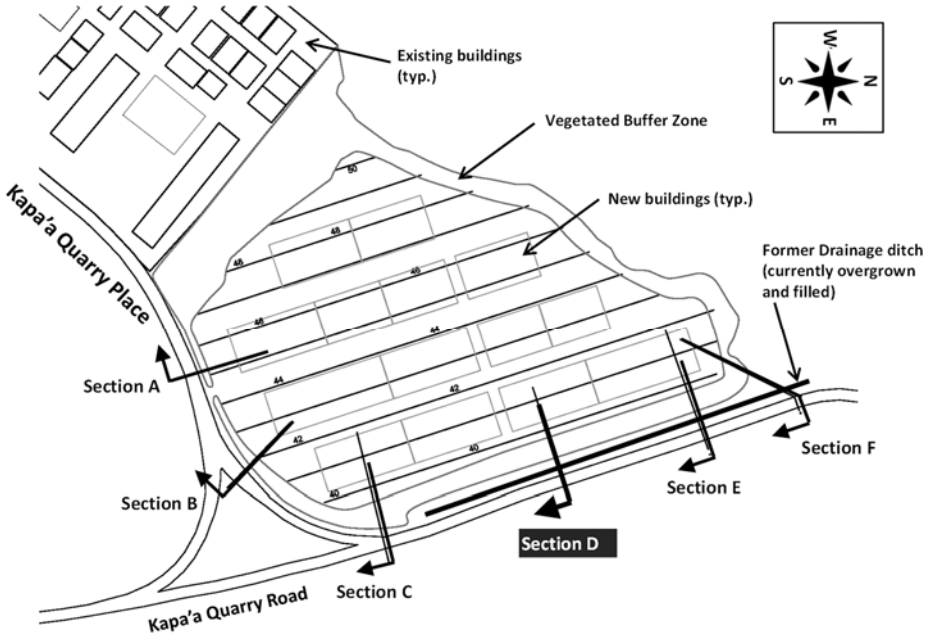


Figure H.6: Locations and orientations of six representative cross section through the proposed site perimeter berm (source Appendix D, Figure 7.1)

Figure H.5 shows the Lower portion of the project site

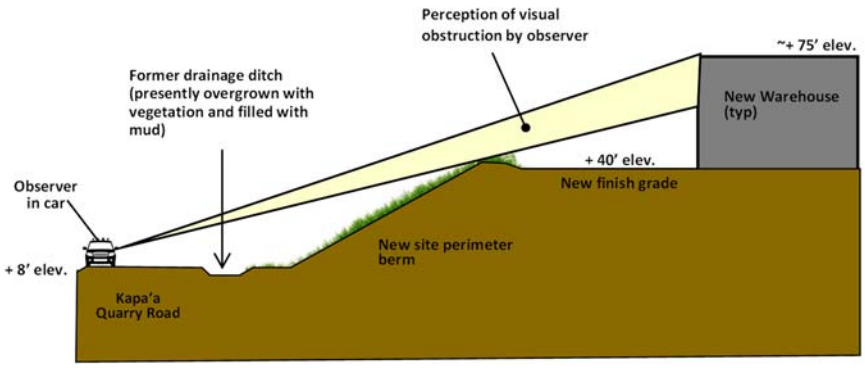


Figure H.7: Cross-section D **without** trees on the new Eastern site perimeter berm (section drawn to scale) (Source Appendix G, Figure 7.8).

The lines of sight intersect with the upper parts of the buildings which are next to the Eastern site perimeter. Therefore, without vegetation the site perimeter berms cannot cover all the buildings.

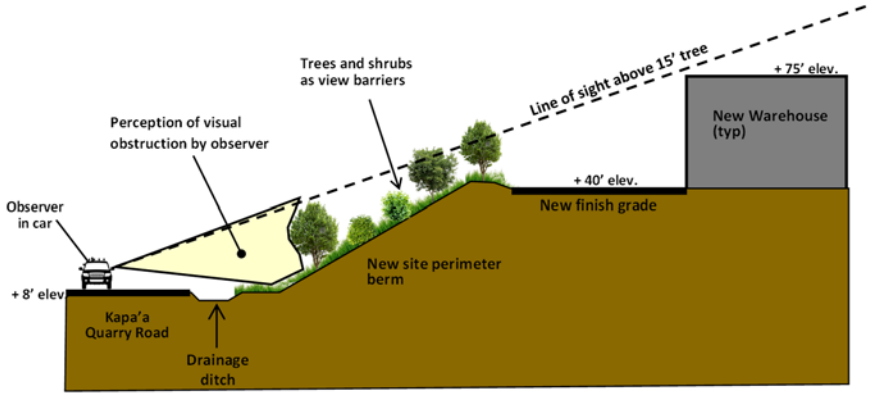


Figure H.8: Cross-section D **with** trees on the new Eastern site perimeter berm (section drawn to scale) (Source Appendix G, Figure 7.9).

With trees on the top of the berms buildings are concealed from the view.

With the proposed addition of trees, shrubs, and other vegetation on the Eastern site perimeter berm visual impact mitigation of views from the adjacent Kapa'a Quarry Road will improved.

Long distant views: Visual impact mitigation from long distance vistas around the Kawainui marsh will be provided by the vegetation on the perimeter berms. In addition, adding selected color schemes on the warehouse structures in the Lower site will significantly improve visual quality. Warehouses in the Upper site are already shielded from long distance view by tall trees that are planted on the Eastern site boundary.

Appendix G of this Final SEIS describes approaches to lower the visual impact of facilities in high value vistas, such as the views from Kailua towards the Koolau mountain range. The preferred method for the project of long-distance visual impact mitigation is the selection of a suitable color scheme. Figure H.9 illustrates the effect on visual impact for long distance views by applying color schemes to buildings. The image (a) shows long a distance view of a building with existing color scheme and (b) a simulated long-distance view with a color scheme matching background color.

(a) Long distance view for a building with **Existing colors** for the building façade and roof

(b) Long distance view for a building with **B = Simulated colors** for the building façade and roof

Figure H.9: Lowering visual impact of long-distance views by color schemes (Source Appendix G, Figure 8.2).

As an example of how new buildings could be painted in the Lower site, Figure H.10 shows one possible color scheme for the future warehouse development. The final color scheme will be selected during the detail engineering phase.

Figure H.10: Possible color schemes of future warehouses, front view from the East (Source Appendix G, Figure 8.3).

Response to DPP comment (I)

• (I)	Page 339 shows that the pervious area between upper and lower portions of the site will be used as an infiltration field for wastewater effluent. Is this area also located over the former landfill? If so, the Final Supplemental EIS should consider redirecting both effluent and stormwater from that area to the stream channel through manufactured treatment devices.

Response: **Background of the advanced wastewater treatment system in the Upper site.**

The project site is not connected to the municipal sewer system. This requires that the wastewater be treated and dispose of at the project site by an on-site wastewater treatment system.

Over the past 30 years, several conventional septic systems have been installed in the Upper site as the number of the warehouses have increased over time. At the present time, there nine conventional septic systems installed in the Upper site. In 2018, the Applicants decided to install advanced wastewater treatment systems for the new warehouses. Two advanced treatment systems are already installed and two are planned for the next three years. Figure I.1 shows the location of the existing conventional septic systems and the existing or planned advanced treatment system. Figure I.1 also shows the location of the infiltration field that is serving the advanced wastewater systems.

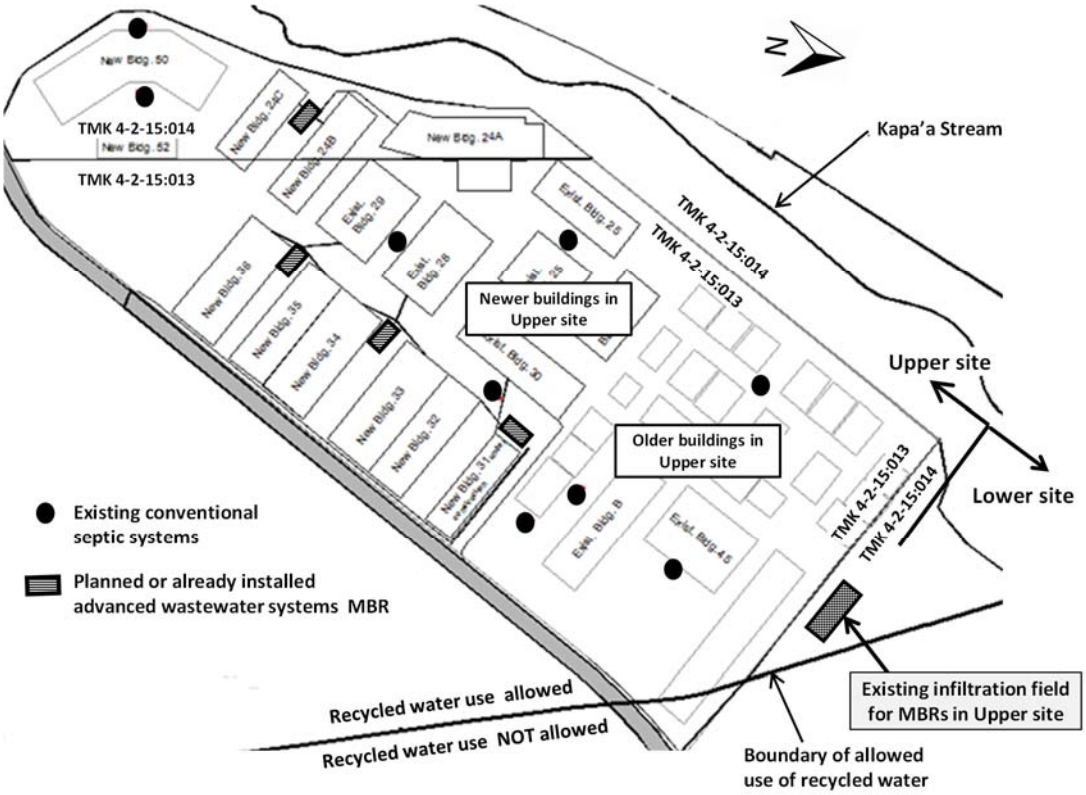


Figure I.1: Locations of wastewater treatment components in the Upper site

At the present, the implementation of the new advanced wastewater system is ongoing under a pilot project that will test the performance of the new systems. The one-year pilot project is in cooperation and under supervision of the Hawaii Department of Health (DoH). During the pilot project, only two systems will be in operation. After the successful completion of the pilot project, more systems will be added both in the Upper and in the Lower site.

These advanced wastewater systems use the Membrane Bioreactor (MBR) technology. Figures I.2 and 3 compare the basic treatment processes of conventional septic systems and the MBR systems.

Figure I.2 illustrate the 2-stage treatment process of removing wastewater pollutants in conventional septic systems. Figure I.2 shows typical levels for the two indicator values for the treatment process effectiveness throughout the treatment process of the conventional septic system. The first indicator is Biological Oxygen Demand (BOD_5), where the number 5 specifies the days the water sample in incubated. The second indicator value is Total Suspended Solid (TSS). The values shown in Figure I.2 are typical values reported by the EPA.

Raw wastewater enters the septic tank where about 50% of the pollutants are eliminated by precipitation of solid particles. The clarified effluent from the septic tank enters the soil absorption field where the effluent is distributed in the drain field to infiltrate into the soil below. The soil below the drain field must be unsaturated soil where microorganisms help remove organic matter, solids, and nutrients from the effluent. Figure I.1 indicates that a well-functioning soil absorption fields is vital for the good performance of the septic system. Figure I.1 shows that a typical conventional septic system lowers the BOD5 and TSS by about 70 to 80%.

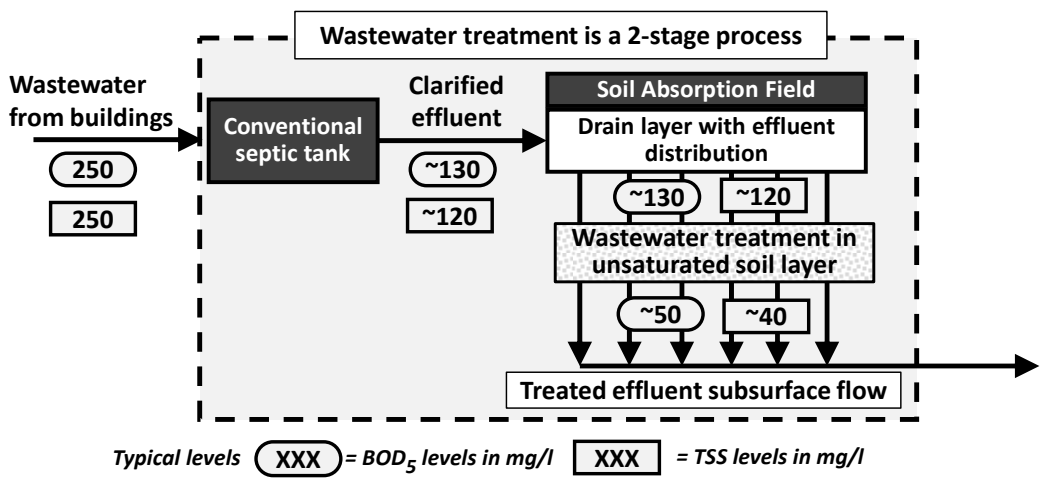


Figure I.2: 2-stage treatment process sin a conventional septic system

Figure I.3 illustrates the treatment process in the MBR system. The entire treatment process occurs inside the septic tank, which is the MBR process tank. No further treatment is required in the downstream soil absorption field. Therefore, the drain field that disposes of the effluent of the MBR process vessel has a different function than a soil absorption filed that serves a conventional septic system. Disposal of the effluent from the MBR field must only infiltrate the treated effluent. Since the effluent of the MBR system is already low in pollutants, no more treatment is required inside the soil drain fields. Consequently, the size of a drain field downstream of a MBR system has a smaller size that the soil absorption field, since only the hydraulic loading must be considered and not the organic loading.

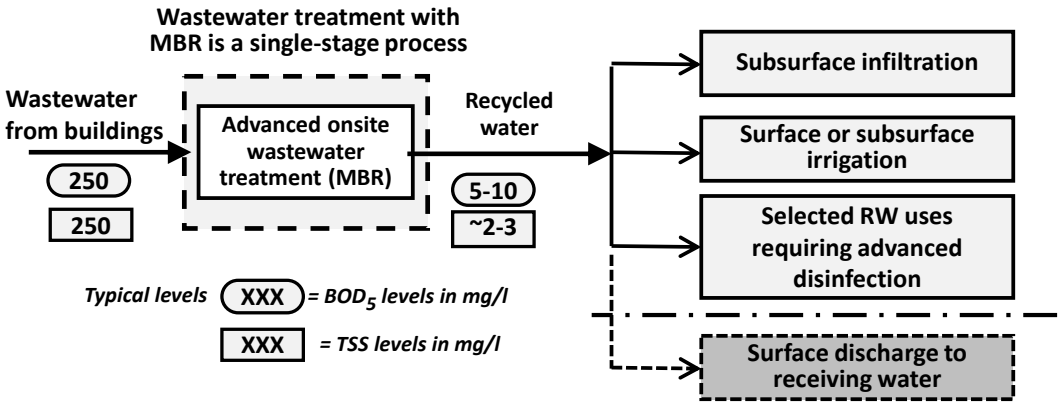


Figure I.3: Single-stage treatment process with the advanced wastewater treatment system (e.g., MBR system)

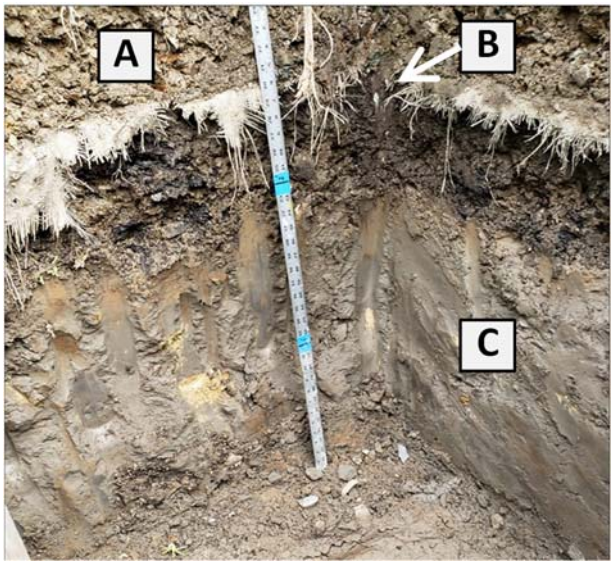
Figure I.3 shows the low residual BOD_5 and TSS values of the effluent from the MBR system. Figure I.3 shows possible applications to dispose or reuse the effluent. Here the effluent is referred to as recycled water (RW) since it can be reused for certain water applications. The top three RW applications are presently considered for use in the Kapa'a Light Industrial Park. The "subsurface infiltration" is the process used in the pilot project, for which the infiltration field in the area between the Upper and Lower site was constructed.

Pervious area between the upper and lower portions of the site

The infiltration field for the advanced wastewater (MBR) system is located within an area between the upper and lower portions of the site is part of the former landfill (refer to Figure I.1).

The area between the upper and lower portions of the site is the outer portion of the former landfill which establishes the Upper site. This area provides lateral stability of the landfill body. A soil survey in conjunction with percolation tests indicated different soil horizons in the inner area of the Upper site and the area at the site perimeter, where the infiltration field is located. Figure I.4 and I.5 show typical soil configurations at locations inside in the core area of the Upper site and (b) location where the infiltration field was constructed, respectively.

Percolation rates measured in the two soils in Figures I.4 and I.5 were ~600 min / inch and 10 min/inch, respectively. The reason for selecting the location of the infiltration field was the significantly better percolation rate of the soil shown in Figure I.5, and the cleaner soil.



A Brown sand loam with gravel (0 – 24" depth)

B Geotextile fabric at 24-inch

C Soil with high fraction of Clay (below 24-inch)

Figure I.4: Typical soil horizon in the core area of the Upper soil, with very high portion of clay

The entire horizon of soil is made of brown sandy loam

Figure I.5: Soil horizon at the location of the infiltration field

Feasibility of discharging the treated effluent from the MBR with storm water.

The DPP comment addressed the need to investigate the feasibility of discharging the effluent from the MBR systems along with storm water to the stream channel (i.e. Kapa'a Stream corridor). Under this scenario, the MBR effluent would be commingled with the storm water discharge and conveyed through the MTD unit to the Kapa'a Stream corridor.

This scenario was proposed by the Applicant to the DoH in 2018, but it was rejected. The basis for our proposal was that the effluent of the MBR system is very low in residual pollutants and resembles storm water. The argument was that it could therefore be directly discharged to the Kapa'a Stream. This type of disposing the effluent from the MBR systems is shown in Figure I.1, as the fourth disposal application (indicated with the dashed arrow and frame).

Figures I.6 through I.8 illustrate the proposed process scenario of discharging the MBR system effluent along with the storm water from the new buildings 31 through 36. (Note: Under an updated site development plan the new buildings will be 31 through 35, with the total floor footprint being the same). Figure I.6 shows a basic process flow diagram. The treated effluent from the MBR systems would enter the storm water drainpipe and flow to the storm water treatment units. Figure I.7 shows an overview of the proposed combined storm water and MBR effluent discharge system.

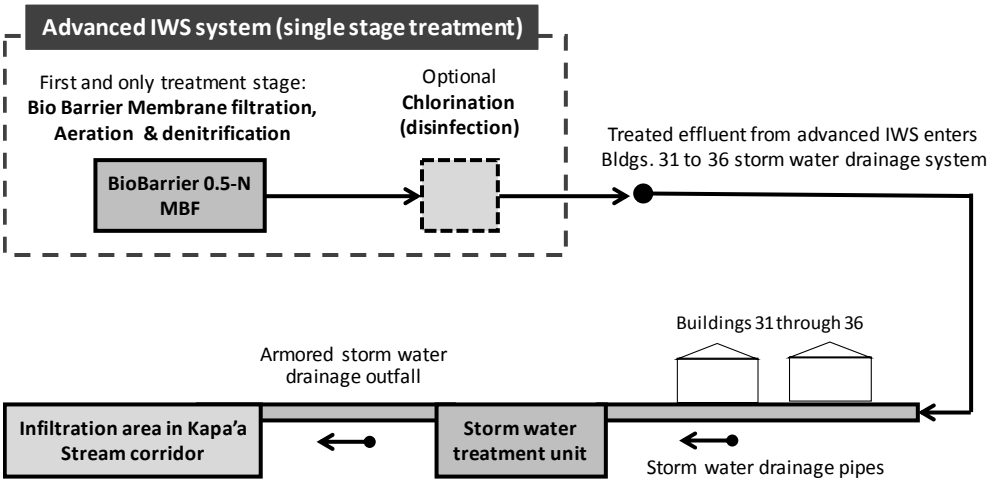


Figure I.6: Basic process flow diagram of discharging the advanced wastewater (e.g., MBR system) effluent with storm water runoff through a mutual treatment unit (Note: here the storm water treatment unit is the MTD unit (source: 2018 SDC proposal to the DoH)

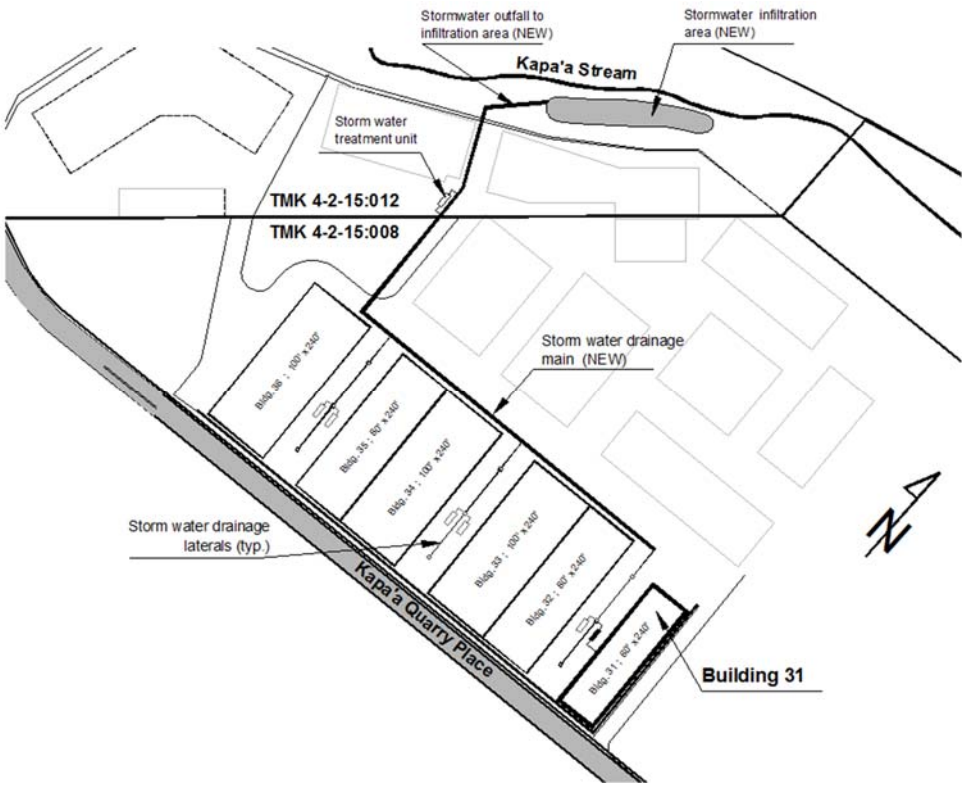


Figure I.7: Overview of proposed combined storm water and MBR system effluent (source: 2018 SDC proposal to the DoH)

Figure I.8 shows a more detail overview of the proposed combined storm water and MBR effluent discharge system. Figure I.9 shows typical details how the Storm water drainage system and the MBR treatment system would be connected.

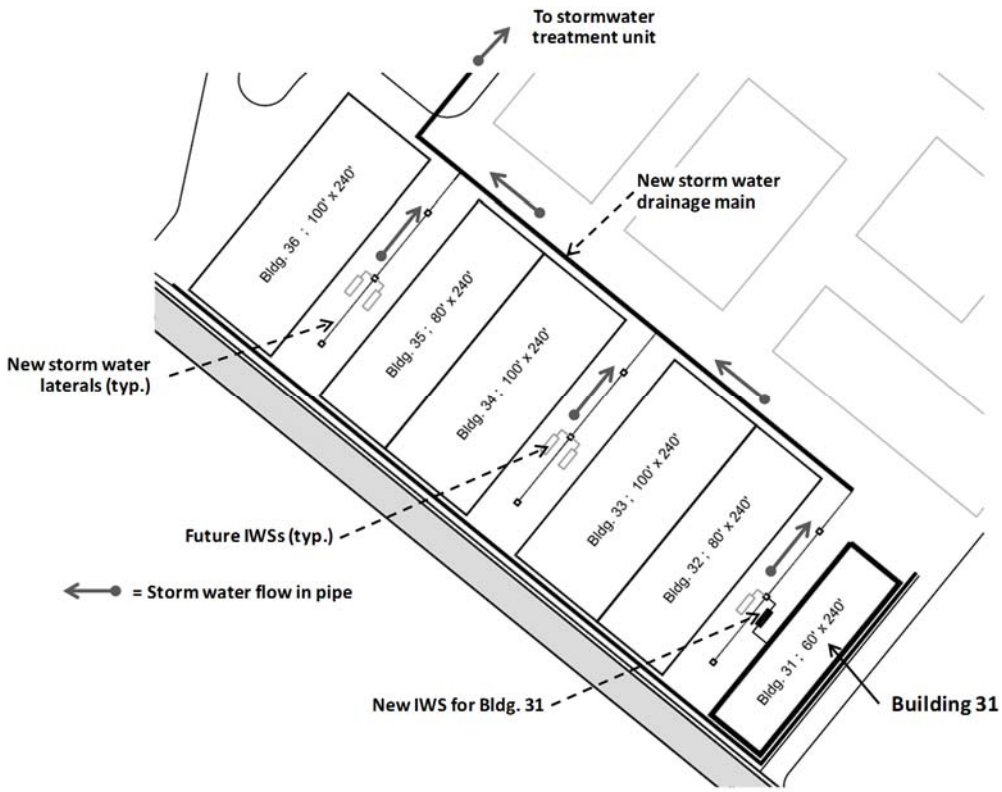


Figure I.8: Overview of proposed combined storm water and MBR system effluent (source: 2018 proposal to the DoH)

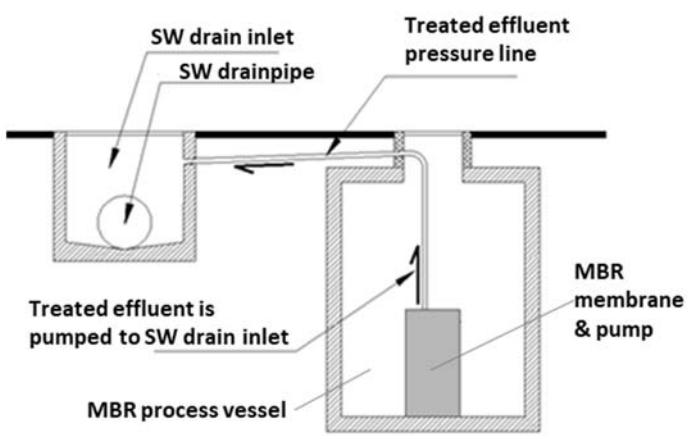


Figure I.9: Details of connecting the storm water system with the MBR effluent systems

Under the proposed approach the treated effluent would be pumped through the membrane of the MBR system to the storm water drain inlet.

Upon submittal in 2018, the proposed combined storm water and MBR effluent discharge approach was rejected by the DoH.

Possible surface discharge of the MBR treated effluent

The process scheme in Figure I.10 shows the possible discharge of the MBR effluent directly to the receiving waters, the Kapa'a Stream corridor. Under the present permit for the pilot project, this approach would not be permissible. Only subsurface disposal of the MBR treated effluent is allowed. If chlorination would occur, disposal might be accepted, but this would require a variance as well as a NPDES permit. The Applicant wants to pursue the option of surface discharge in the future.

A variance of the HAR 11-62 wastewater rules have already been granted by the DoH under the pilot project. Typically, the disposal of effluent from onsite wastewater systems needs to occur by means of a drain field (e.g., soil absorption field) which is sized by applying the percolation rate of the soil. In calculating the required drain field size, a tabulated value is obtained for a specific measured percolation rate of the soil. This tabulated value is then multiplied by volume of the disposed wastewater.

Since the use of the single-stage advanced wastewater treatment in the MBR system does not require further treatment in the soil absorption field, a smaller infiltration field size can be used in comparison with a soil absorption field for a conventional septic system.

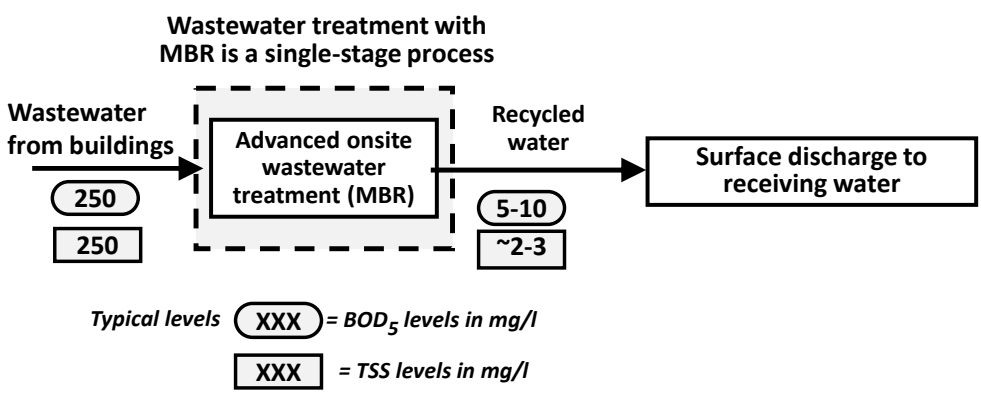


Figure I.10: Single-stage treatment process with the advanced wastewater treatment system (e.g., MBR system)

The expected environmental impacts of disposing the treated MBR effluent directly into the receiving water is considered not significant. It might be required to chlorinate the effluent before disposal.

The membrane filtering in the MBR system is already highly effective and therefore a further filtration in a MTD unit would be redundant, since the MBR membrane holds back more pollutants.

Response to DPP comment (J)

• (J)	Page 196 mentions the possibility of a Kawainui Marsh perimeter pathway for bikers and pedestrians, and states that 1,500 linear feet could be built on site. With the proposed modifications, would the property still have room for the future development of the bike path?

Response: The plan for the future Kawainui Marsh improvement includes a possible perimeter path around the marsh. For an approximate 1,500 feet section of the possible alignment of that perimeter path (1,500-foot section) the preferred alignment would go over the property of the Applicant. This path alignment would interfere with the existing drainage ditch along the Kapa'a Quarry Road, which is located adjacent to the Eastern project site perimeter. Therefore, installation of the 1,500-foot section would require a new configuration of the area around the present drainage ditch.

Figure J.1 shows the possible alignment of the future marsh perimeter pathway on TMK 4-2-15:014, the property of Kapa'a 1, LLC (Applicant), the landowner of the Lower site. The section of the future perimeter pathway on TMK 4-2-15:014 would have a length of approximately 1,500 feet. The possible alignment would run along the Eastern site boundary of the Lower site.

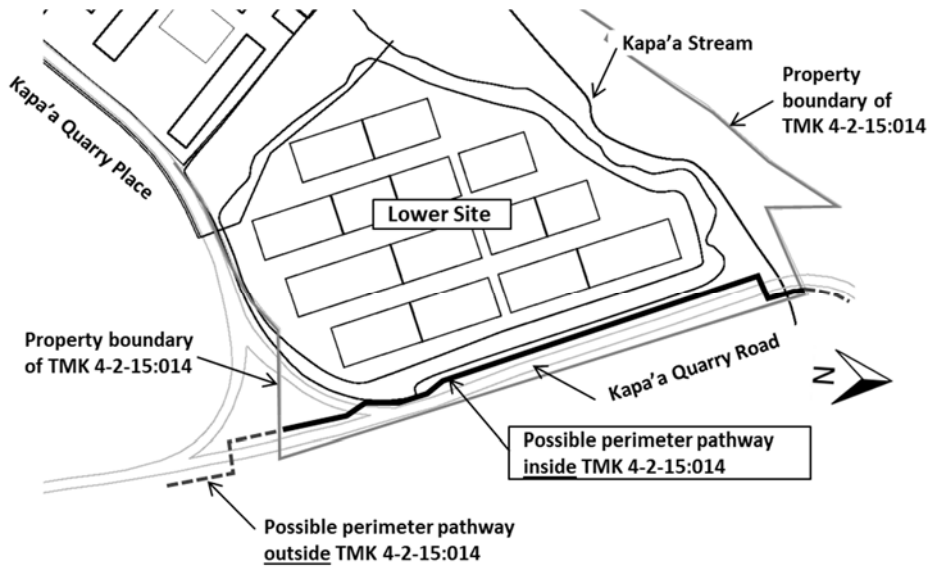


Figure J.1: Possible alignment of a 1,500-foot section of the future marsh perimeter path on the property of the landowner of the Lower site, TMK 4-2-15:014

Appendix J of this Final SEIS describes the conditions of the drainage ditch which have been changing for the past 20 years. Appendix J also provides a proposed redevelopment of the drainage ditch area by filling up the now fully silted and overgrown ditch bed and installing the path on its place, along with a vegetated swale. Figure J.2 shows changing conditions of the drainage ditch over the period of 2003 to the present. As Figure J.2 suggests, the drainage ditch changed from free water surface in 2003 to the present condition, where the ditch cannot be distinguished from adjacent vegetated land.

Figure J.2 shows the proposed redevelopment plan of the drainage ditch area. Under this proposed development the drainage ditch would be excavated and refilled with a layer of gravel. A vegetated

swale would be installed above the new fill. Storm water runoff from the road and the adjacent land would enter the vegetated swale and would flow toward the Kapa'a Stream corridor. Stormwater would also percolate through the vegetated swale and enter the fill below. The water would then either infiltrate into the surrounding soil or enter a perforated drainage pipe which would convey it toward the Kapa'a Stream. A new combined pathway for pedestrians or bikers would be constructed, also serving as a maintenance road for the vegetated swale. The proposed pathway would have a pervious gravel pavement.

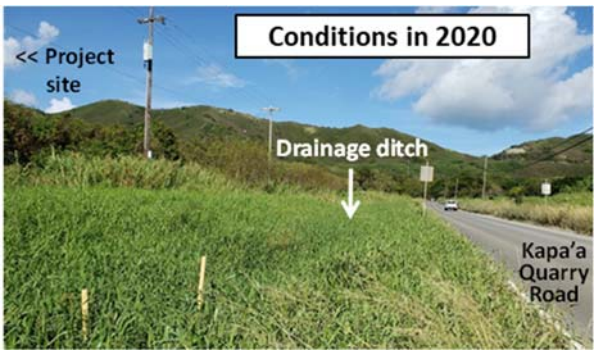


Figure J.2: Changing conditions of the drainage ditch along the Kapa'a Quarry Road from 2003 to present day (source: Image from Appendix J of this Final SEIS)

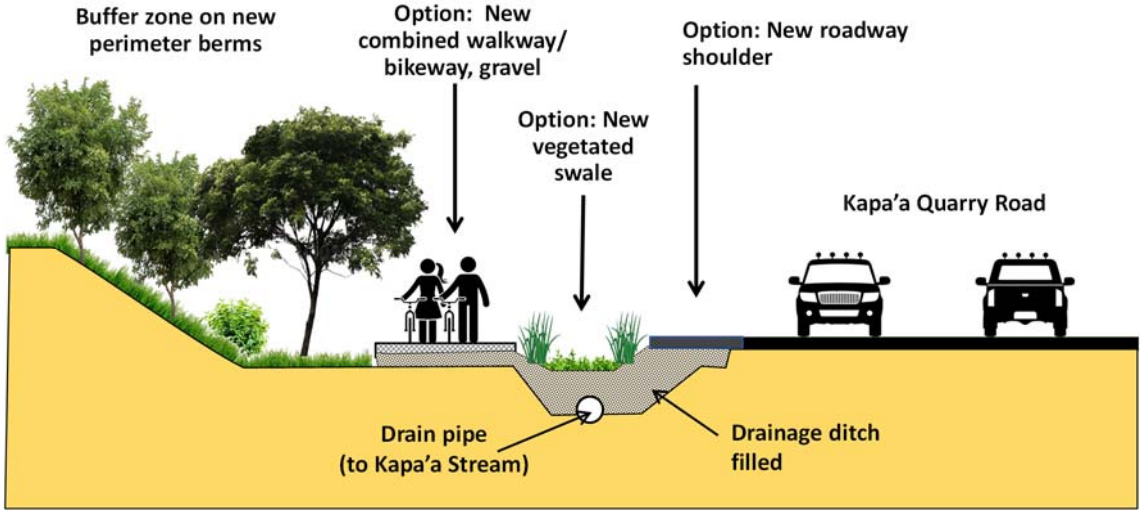


Figure J.1: Proposed modification of the drainage ditch (source: Figure 4.1 of Appendix J)

Response to DPP comment (K)

- **(K)** The proposed action is consistent with the Koolau Poko Sustainable Communities Plan (KPSCP).

  The KPSCP designates the Kapaa light industrial subdivision as the location where most of Koolau Poko's industrial land and building inventory is expected to be located to meet future demand. The proposed development would be considered as a light industrial use in the KPSCP's category of "Light Industrial and Extractive Industries" and is expected to conform to the language of KPSCP Section 3.6.1.5. The Section includes a policy which promotes "a re-use plan for the Kapaa quarry that includes an expansion of light industrial use, if sufficient demand can be demonstrated." Such demand was demonstrated in the 2010 market study done for the 2011 EIS, as well as an existing four percent average vacancy rate. Both the upper and lower portions of the Project site are designated "Industrial" and located within the Community Growth Boundary in Map A-2: Land Use. The proposed land use type has not changed since the initial Project was reviewed and accepted by the Department of Planning and Permitting (DPP) for the 2011 Final EIS.

We concur with the statement and have no further responses.

Response to DPP comment (L)

• (L)	Most of the guidelines for Light and Extractive Industry, outlined in KPSCP Section 3.6.2.4, are covered in the Unilateral Agreement (UA) conditions of the Zone Change, Ordinance 13-35. Compliance with UA conditions determine conformity with the KPSCP. Condition 6 of the UA requires that a "written status report to the DPP documenting its satisfaction and/or describing progress towards complying with each condition" be submitted every year by December 31st to the DPP. This condition has not been fulfilled since 2015. In the absence of annual report(s), please include in the Final Supplemental EIS a more detailed summary of, if and how the proposed action in the Draft Supplemental EIS meet each of the UA conditions of Ordinance 13-35, and if any approved plans need updating.
(L) cont.	Consult with DPP's Traffic Review Branch as to whether additional updates to the fulfillment of UA Condition 1 relating to transportation may be required as a result of the proposed action in the Draft Supplemental EIS. UA Condition 2 requires a vegetated buffer zone around the Project to mitigate noise and visual impacts. Expand on how the proposed improvements, such as modifications to increase the heights and widths of the berms and proposed use of native plant species, address UA Condition 2. UA Condition 3 relating to stormwater treatment and flood control are being fulfilled by the proposed action and have triggered a need for this Supplemental EIS. The KPSCP guideline regarding harmful leachate is being addressed in the updated site development plan by sealing the surface of the site with an impervious cover. Stormwater Best Management Practices (BMPs) under the 2011 Final EIS have been replaced by stormwater BMPs which are more effective in treating stormwater runoff. Verify with the DPP Civil Engineering Branch for consistency with UA Condition 3. Finally, the UA condition requiring lighting impact mitigation has been approved by the DPP and the Department of Land and Natural Resources (DLNR), addressing KPSCP guidelines regarding full-shielded lighting that balances the needs for public safety, security, energy conservation, and wildlife protection. Please indicate how the proposed additional warehouse structures and tenants will comply with the exterior lighting plans approved by DLNR in 2014 and 2016, and include documentation of consultation with DLNR as needed.

Appendix K of this Final SEIS provides a detailed discussion of the efforts by the landowner and operator of the KLIP to satisfy the conditions of the Unilateral Agreement.

RESPONSES TO COMMENTS RECEIVED FROM KAILUA NEIGHBORHOOD BOARD

The following letter was received from the Kailua Neighborhood Board (5 pages)

KAILUA NEIGHBORHOOD BOARD NO. 31
WILLIAM M. HICKS, CHAIRMAN • 923 AKUMU STREET • KAILUA, HAWAII, 96734-4004
PHONE (808) 230-2293 • E-MAIL billhicksknb@gmail.com

January 7, 2021

Mr. Manfred Zapka
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Mr. Zack Stoddard
City and County of Honolulu Department of Planning and Permitting
Land Use Approval Branch
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Honolulu, HI 96822
zachary.stoddard@honolulu.gov

Subject: Kailua Neighborhood Board Questions, Comments, and Recommendations Regarding the Kapa'a Light Industrial Park Draft Supplemental Environmental Impact Statement (SEIS)

Aloha Mr. Zapka and Mr. Stoddard,

The Kailua Neighborhood Board (KNB) has taken a long interest in safeguarding the fragile environment of the Kawainui Marsh and ensuring any development at the adjacent Kapa'a Light Industrial Park fully respects the environment. We appreciate the November 23, 2020 invitation to comment upon the Kapa'a Light Industrial Park Draft Supplemental Environmental Impact Statement (SEIS). The Neighborhood Board and Sunshine Law processes require that all KNB deliberations occur at open public meetings with published agendas, therefore today is the soonest the KNB could develop and approve comments, questions, and recommendations. At this evening's KNB Regular Meeting the following resolution was unanimously passed approving KNB comments on the Draft SEIS. Recognizing that input and suggestions about the Draft SEIS must be postmarked or emailed by January 7, 2021, a pdf copy of this signed letter is being emailed on January 7th with the subject "Kapa'a Draft SEIS comments from the Kailua Neighborhood Board"; hard copies of this letter will be in the USPS system on January 8th.

The Kailua Neighborhood Board approves the following comments and recommendations of the Planning, Zoning and Environment Committee to the Department of Planning and Permitting on the proposed Kapa'a Light Industrial Park Supplemental Environmental Impact Statement (SEIS), including the request that the Department of Planning and Permitting reject this SEIS.

GENERAL COMMENTS AND QUESTIONS:

(1) The SEIS needs to be corrected when discussing the ditch alongside Kapa'a Quarry Road. The SEIS repeatedly refers to the ditch as previous but the ditch still exists. While overgrown and not recognizable as a ditch, it still remains and, once cleaned, it can once again work as designed and required to filter stormwater runoff before migrating into Kawainui Marsh and eventually Kailua Bay.

(a) "Closure of the Phase 1 landfill included construction of a surface water drainage channel that directs flow from the east and north sides of the sub-basin into Kawainui Marsh through a desilting basin located alongside Kapa'a Quarry Road" (Kapa'a Valley The TMDL Sub-basins no date)

(2) Does the applicant have a permit(s) to park cars on the lower section?

Oahu's Neighborhood Board system – Established 1973

(3) The Kailua Neighborhood Board previously presented valid reasons why the EIS should not be approved, but DPP approved the EIS in part because of the proposed advanced comprehensive stormwater system. To this day that infrastructure has not been put in. Instead, an unknown amount of fill material has been brought onto the lower section steadily increasing the height.

(4) What is the expected velocity of stormwater coming out of the pipes into Kapa'a Stream during the dry season and wet season?

(5) What is the amount of stormwater that will be directed from each drainpipe per day into Kapa'a Stream during the dry season and during the wet season?

(6) Over the years fill material has been brought in and spread over the lower section. How much rap and other fill material have been brought into the lower section since 2011?

(7) Has all the fill material brought onto the site been compacted?

SPECIFIC COMMENTS:

(1) Require applicant to camouflage all new structures or hide them behind a screen of vegetation

(2) Require applicant to install a substantial capacity of photo-voltaic panels on all existing and new warehouses

(3) Require applicant to reinstate provision for trees between buildings to provide shade, reduce non-roof heat island effect, reduce noise, and capture storm water

(4) Require applicant to conduct the DOT and Unilateral Agreement required TIAR as part of the Final SEIS approval process

(5) Require on-site water monitoring wells

(6) Require that the industrial park hook up to the municipal sewer system to prevent directing all stormwater into the TMDL and Impaired Water Body Kapaa Stream, which runs into Class A waters of Kawainui Marsh and Kailua Bay

(7) Require that the drainage ditch at the foot of the lower portion of the industrial park property on the mauka side of Kapa`a Quarry Road be enlarged and regularly cleaned of all overgrowth, debris, and silt so that it is once again the receiving area for runoff from the former landfill site and serve as the designed filter for stormwater before it enters Kawainui Marsh

(a) Require applicant to identify permanent Best Management Practices especially designed for industrial parks that will be used

(b) Require applicant to create a Storm Drainage System maintenance plan which includes required quarterly reports to the DPP

(c) Require maintenance records detailing the frequency, quantity, and material composition of the material removed from the sediment basin

(d) Require quarterly maintenance records detailing pollutants from existing businesses within the Kapa'a Industrial Park and assessing the potential for pollutant reductions

(e) Require applicant to fully fund and install Oceanit/AECOS stream monitoring stations to monitor the quality of water flowing from the industrial park into Kapa'a Stream in perpetuity. Require one station to be located near the settling basin, one station in the middle section of the industrial park, one station in the lower section fronting Kapa'a Stream, and one monitoring station in the lower section at the ditch along Kapa'a Quarry Road

(8) Require that the applicant make explicit any changes and increases in pollutants from the new drainage and sewage system

(9) Require that the drainage and sewage systems be installed before any structures are approved

(a) This requirement is needed to prevent the applicant from changing the topography and coming back for additional changes later

(b) This requirement is needed to prevent the applicant from continually changing stormwater treatments. The FEIS states "The stormwater treatment system used in the DEIS design has changed from the design presented in the FEA." Now the SEIS claims that a soil analysis revealed the need to change the drainage system again.

RECOMMENDATION TO DPP - Request that DPP does not approve the SEIS for the following reasons:

(1) The proposed plan directs all stormwater in the lower portion into Kapa`a Stream, which is a Total Maximum Daily Load (TMDL) stream and is listed as an Impaired Water Body under the Clean Water Act §303 (d) that drains into the Class 1A waters of Kawainui Marsh, which drain into Kailua Bay

(a) TMDL is a regulatory term in the U.S. Clean Water Act, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards

(b) The objective of a TMDL is to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken, and water quality standards achieved

(c) MDL stands for "Total Maximum Daily Load". A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can accept and still meet the state's Water Quality Standards for public health and healthy ecosystems

(d) "The City will assist DOH in engaging the surrounding land users to determine if there are additional opportunities to alter existing business practices to realize pollutant load reductions via education and outreach." (Implementation and Monitoring Plan for Kapaa Stream Wasteload Allocation for the City and County of Honolulu Municipal Separate Storm Sewer System NPDES Permit No. HI S000002 June 2015)

(e) There does not appear to be any TMDLs specifically assigned to either individual businesses within the industrial park or the industrial park as a whole beyond those identified as "industrial" in the Total Maximum Daily Loads (TMDLs) for Total Suspended Solids, Nitrogen and Phosphorus in Kapa'a Stream Kailua, Hawaii DOH Environmental Health Administration 2007 report.

- Has the TMDL for the industrial park been updated since the park has expanded since 2007?
- Does the industrial park and/or individual businesses within the industrial park have a TMDL assigned to them?

(f) On October 16, 2013, the EPA issued the City Department of Environmental Services a Notice of Apparent Violation (NAV) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4). Under the notice of violation Load Reductions to Achieve Kapa'a Stream TMDLs, the industrial park was required to reduce TSS, TGN, and TP.

- Has the industrial park met the EPA's required reductions?

(2) The industrial park presently contributes about 16% of the entire Kapa`a watershed TSS baseload and directing all stormwater will increase the contaminants

(3) At present the water quality of Kapa`a Stream is primarily affected from high TSS content. This causes related consequences of higher turbidity in Kawainui Marsh

(4) During intense storms water levels in the stream increase and can cause the transport of sediments and other pollutants to the downstream wetland and marsh

(5) Elimination of trees in the inside of industrial park increases impervious surfaces, eliminates shade for people and buildings, and eliminates the capacity to store and reuse stormwater by half

(6) Converting 27 acres in the lower portion from pervious to impervious increases captured and non-captured stormwater runoff which, under proposed modifications, the flows are directed to Kapa`a Stream

(7) Severe environmental impacts on Kapa`a Stream and Kawainui Marsh from paving over 147,000 square feet for new warehouses and parking spaces and directing all stormwater to the stream

(8) Visual impacts from 15 warehouses 5,000+ to 24,000+ square feet and 40 feet tall

(a) There are no topographic maps in the SEIS showing the height of the lower portion before the land was purchased for an industrial park, the existing height after the owner put in unknown yards of soil and rock, and the finished height of the lower section when increased by 40-50 feet

(b) Just as the transfer station and lights are visible from multiple areas of Kailua, so will this new section with 15 warehouse structures, roofs, and associated lights.

(c) "Tall" trees on top of a perimeter berm to hide the warehouses take a long time to grow and could be cut down and die thus leaving the warehouses visible from all areas of Kailua. Berm will be about 2 feet higher than the full buildout interior site finish grade

- How many "tall" trees will be planted on top of the berm? What type of trees will be used?
- Given that the ground is raised 50 feet and will have 40-foot-tall warehouses on top, what is the anticipated height of the trees that will hide the warehouses from being visible throughout Kailua?

(d) Kawainui Marsh is at 3 feet above sea level. Before being used as a city dump, this section was part of Kawainui Marsh and at about 3 feet above sea level.

(e) The SEIS does not show any views from Kapaa Quarry Road looking up at 50+ feet with 40-foot buildings on top

(f) Without exact information on final finished grade for lower section, but using the proposal's words to increase the height to 40 or 50 feet, calculates to approximately 15,000 semi-trucks that will be needed to bring in approximately 2.22 million cubic yards of material.

(g) The SEIS does not identify the source(s) of where the fill material will come from, the type(s) of fill material that will be used or allowed, how much fill will be needed to reach the 50-foot height, whether the fill material will be tested before being allowed on the lower section, and what types of permits are needed to bring in fill material.

(9) The following are missing from the SEIS:

(a) Topographic map when landfill closed, when King family bought property and Hawaiian Earth Products was the tenant.

(b) Topographic map of existing lower site

(c) Topographic map of finished grade with building rendering on top of finished grade showing views from the levee and Kapa'a Quarry Road

(d) Without this information it is impossible to assess the visual and environmental impacts from the dramatic increase of the height of the lower section.

BACKGROUND INFORMATION:

In our continuing effort to protect Kapa'a Stream, Maunawili Stream, Kahanaiki Stream, Kawainui Marsh, and Kailua Bay the KNB has provided comments and recommendations on all applications that the Board feels will impact the waters of Kailua. Since 2009 when the landowner John King applied to expand industrial uses in Kapa'a Valley, the KNB has responded to each application and environmental document with concerns about impacts of an expanded industrial park on the water quality of adjacent Kapa'a Stream, Kawainui Marsh, and Kailua Bay.

(1) In 2009 the KNB expressed concerns in the DEA, among other things, regarding:

(a) Effectiveness of the 18 septic wastewater systems' ability to accommodate 500-700 employees, at full buildout, while protecting Kapa`a Stream and Kawainui Marsh from harmful sewage overflow

(b) Impacts of storm water runoff from proposed 446 parking spaces on Kapa`a Stream and Kawainui Marsh

(c) Visual impacts from 5,000+ to 24,000+ square feet, 40 feet tall warehouses

(d) Effectiveness of the storm runoff collection and detention system especially the lower portion where the detention system was to collect 70,500 cubic feet of runoff

(e) Impacts on Kapa`a Stream and Kawainui from paving over 147,000 square feet for new warehouses and parking spaces

(f) Public safety concerns regarding the industrial parks push to have customers/employees ride bicycles on the substandard and dangerous Kapa`a Quarry Road to the industrial park

(g) Quantity and quality of storm water runoff into Kapa`a Stream

(h) Impacts from increased lighting on night views and migrating water birds

(i) Increased traffic on substandard Kapa`a Quarry Road

(j) Impacts of all stormwater systems on Kapa`a Stream and Kawainui Marsh

(k) Impacts from wastewater systems on Kapa`a Stream and Kawainui Marsh

(2) In the 2011 EIS the KNB expressed the same concerns as in the DEA with the addition of the following:

(a) That the drainage ditch at the foot of the lower portion of the industrial park property on the mauka side of Kapa`a Quarry Road be enlarged to be the receiving area for runoff from the industrial park, thus filtering storm water before it enters Kawainui Marsh.

(b) Require on-site water monitoring wells

(3) A September 14, 2011 letter to DPP Director David Tanoue Sustainable Design & Consulting LLI stated "we fully agree with the need to "camouflage the new structures or hidden behind a screen of vegetation to the extent possible" and that the industrial park will install "a substantial capacity of photo-voltaic on the existing warehouses…." Since that 2011 letter there has not been any mention of camouflage or photovoltaic in any of the following environmental documents.

(a) The FSEIS must contain explanations as to why these two commitments have not been met or discussed in other environmental documents.

(b) The same letter stated that trees would be next to buildings "to provide shade (e.g. reduce non-roof heat island effect, reduce noise and evaporated captured stormwater…"

(c) The FSEIS must explain why trees that were touted as being beneficial have been eliminated from the interior of the industrial park and will only be on the perimeter.

(4) In 2013 the KNB opposed the rezoning of three parcels in Kapa`a Industrial Park from P-2 to I-I for basically the same reasons stated in the board's responses to previous environmental documents. There was strong community opposition to the rezoning, but community voices were ignored.

(5) In 2014 the KNB, which consists of 19 Kailua residents elected to represent Kailua, opposed granting the Special Use Permit 2014/SMA-27 (NA) for all the reasons given in response to previous environmental documents.

(6) It is our understanding that DPP approved all the Kapa`a Industrial Park environmental documents in part because of the comprehensive storm water system proposed for the lower portion of the industrial park. Now for some reason the lower portion superior storm water drainage system does not fit into the applicant's development plans and has been modified. In addition, the number of buildings and amount of impervious surfaces have expanded, and the height of the lower portion has been raised from 25 to 30 feet to 40 to 50 feet.

(7) So, once again, the KNB presents our comments and concerns on the Kapa`a Industrial Park Supplemental Environmental Impact Statement in our effort to protect Kapa`a Stream, which is listed as an Impaired Water Body under the Clean Water Act §303(d), the Class 1A waters of Kawainui Marsh, which is the only Ramsar Wetland of International Importance in Hawaii, and the health and safety of the public.

Mahalo for your consideration of this KNB resolution.

Sincerely,

William M. Hicks

William M. Hicks
Chairman, Kailua Neighborhood Board

Copy to:
Councilwoman Esther Kia'aina ekiaaina@honolulu.gov
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Responses to "General Comments and Questions :

GENERAL COMMENTS AND QUESTIONS:

(1) The SEIS needs to be corrected when discussing the ditch alongside Kapa'a Quarry Road. The SEIS repeatedly refers to the ditch as previous but the ditch still exists. While overgrown and not recognizable as a ditch, it still remains and, once cleaned, it can once again work as designed and required to filter stormwater runoff before migrating into Kawainui Marsh and eventually Kailua Bay.

(a) "Closure of the Phase 1 landfill included construction of a surface water drainage channel that directs flow from the east and north sides of the sub-basin into Kawainui Marsh through a desilting basin located alongside Kapa'a Quarry Road" (Kapa`a Valley The TMDL Sub-basins no date)

(2) Does the applicant have a permit(s) to park cars on the lower section?

(3) The Kailua Neighborhood Board previously presented valid reasons why the EIS should not be approved, but DPP approved the EIS in part because of the proposed advanced comprehensive stormwater system. To this day that infrastructure has not been put in. Instead, an unknown amount of fill material has been brought onto the lower section steadily increasing the height.

(4) What is the expected velocity of stormwater coming out of the pipes into Kapa'a Stream during the dry season and wet season?

(5) What is the amount of stormwater that will be directed from each drainpipe per day into Kapa'a Stream during the dry season and during the wet season?

(6) Over the years fill material has been brought in and spread over the lower section. How much rap and other fill material have been brought into the lower section since 2011?

(7) Has all the fill material brought onto the site been compacted?

Response to General Comments and Questions (1) and (1) (a)

The conditions of the drainage ditch and proposed plans are discussed in detail in **Appendix J of this Final SEIS**.

The drainage ditch along the Kapa'a Quarry Road has seen significant changes over the past 20 years, changing from a ditch with a free water surface to a presently overgrown area adjacent to the roadway. In our assessment, in its present condition the drainage ditch has much less capability to convey storm water runoff than when it had a free surface.

In 2011 almost the entire water surface of the ditch was observed overgrown with algae. Then, over the following years soil accumulated inside the ditch and vegetation started to grow on that accumulated soil, first small plants, and then presently high 6-feet tall plants.

In accordance with previous scientific and engineering descriptions, including the 2007 assessment of the TMDL for the Kapa'a Stream, the drainage ditch along the Kapa'a Quarry Road was supposed to *provide some form of drainage of the sub-basin 10 "New Green waste".* The TMDL report infers that the ditch receives little surface water flow during rains but receives some quantities of ground water flow from the sub-basin 10. The sub-basin 10 is the Lower site.

The assumptions of the TMDL also suggest that most of the precipitation infiltrates into the ground of the Lower site. Therefore, it is concluded that most of the water emerging the drainage ditch originates from water percolation through the landfill body. This typically generates leachate which can have negative impact to the surrounding environment, because of entraining and transporting pollutant from trash inside the former landfill body to the outside.

An appropriate mitigation strategy against the generation of leachate from landfills is to seal the cover of a former landfill to lower the infiltration of rainwater. This strategy is followed in the design of the full build-out development of the Lower site. With the impermeable cover in place, the amount of water flowing from the Lower site to the drainage ditch is expected to be reduced significantly.

The fact that the ditch, in its present overgrown condition, is not frequently overflowing can be interpreted as an indication that the quantities of ground water collecting in the ditch is not significant. Since the ditch is presently filled with silty soil deposits that have low percolation rates, it is assumed that no subsurface flow occurs inside the drainage ditch toward the Kapa'a Stream.

The Kapa'a Quarry Road along with the drainage ditch on the Mauka side of the roadway are being maintained by the City & County of Honolulu, which has been granted easement by the owner of TMK 4-2-15:014 (Applicant).

Appendix J describes the proposed changes to the drainage ditch. The drainage ditch would be excavated and filled with permeable soil replacement, with sufficient void ratio to allow storage and infiltration of the storm water collecting inside the drainage ditch. On the top of the new fill, a vegetated swale would be installed. The vegetated swale would provide conveyance capacity for runoff toward the Kapa'a Stream. Surface runoff from the roadway would enter the vegetated swale, which would provide Low Impact development (LID) treatment. At the foot of the fill, a perforated drainpipe could provide drainage capacity toward the Kapa'a Stream.

Figure 1 shows a representative section of the proposed modification of the drainage ditch. A narrow shoulder could be added to the roadway, thereby increasing traffic safety. The new development of the drainage ditch could accommodate the construction of a section of the planned marsh perimeter pathway.

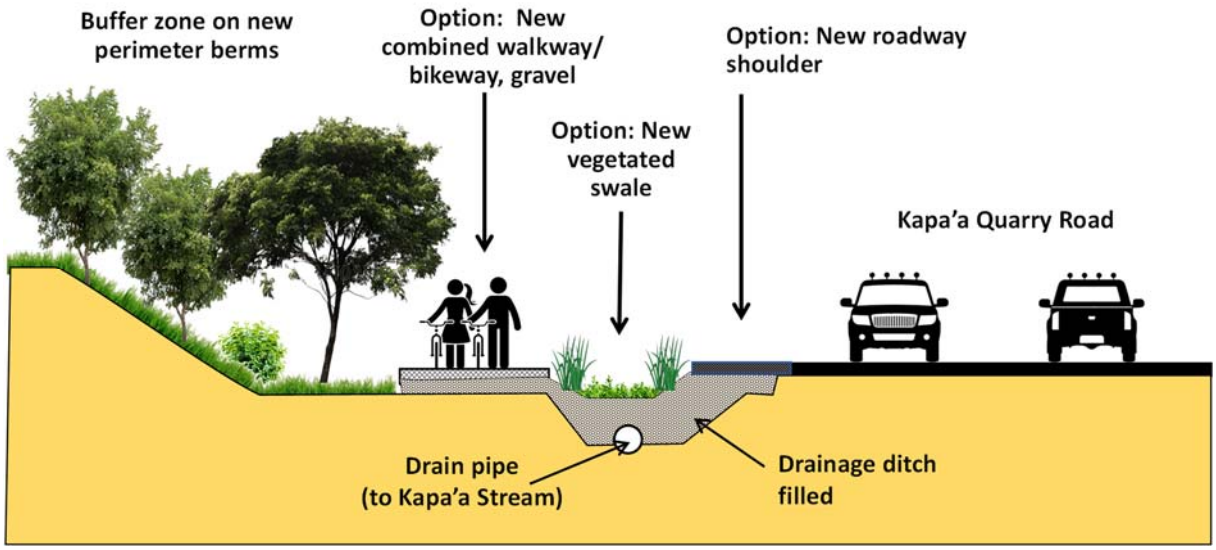


Figure 1: Proposed modification of the drainage ditch (source Appendix J of this Final SEIS, Figure 4.1)

In our assessment, the proposed modifications to the drainage ditch would improve impacts to the environment and the community.

One argument against restoring the drainage ditch by excavating and creating free water surfaces adjacent to the roadway is the possibility of roadkill of birds. The US Fish and Wildlife (USFWS) Service cautioned against creating new storm water treatment and management facilities with large free water surfaces within the Lower portion of the site. In accordance with USFWS such larger free water surfaces could attract listed water birds which would then subject to increased risks. The same rationale should be applied to a restored drainage ditch with free water surface.

Another reason against excavating the drainage ditch and creating a free surface is traffic safety risks. In the original condition, there was practically no distance between the drainage ditch and the roadway, creating significant traffic safety risks.

Response to General Comments and Questions (2):

(2) Does the applicant have a permit(s) to park cars on the lower section?

Response: At the present time the Lower site is used as a parking lot, or better outdoor holding area, for new cars. No permits are needed. In accordance with the ROH 21-3 Master Use Table under "TRANSPORTATION AND PARKING - Commercial parking lots and garages are allowed in the I-1 zoned Lower site.

Regarding storm water impacts, new cars can be stored outside without concern about entrainment of pollutants, provided that the cars are in good working order and do not leak oil.

Response to General Comments and Questions (3):

(3) The Kailua Neighborhood Board previously presented valid reasons why the EIS should not be approved, but DPP approved the EIS in part because of the proposed advanced comprehensive stormwater system. To this day that infrastructure has not been put in. Instead, an unknown amount of fill material has been brought onto the lower section steadily increasing the height.

Response: A comprehensive storm water treatment and management system will be installed at the site. At the time of the 2011 FEIS, the proposed storm water system for the Lower site was ahead of the storm water regulation implemented by the DPP. Since 2011, permit requirements have been made more restrictive for storm water treatment and management.

The proposed storm water system for the project site, as described in the Draft SEIS, is still ahead of updated regulations. The storm water treatment and management systems and approaches in the entire Kapa'a Light Industrial Park are diverse since each part of the development have different aspects and must respond to different site conditions.

Using Low Impact Development (LID) storm water strategies to the extent possible has challenges in the KLIP. Because the site is a former landfill, it necessitates the sealing of the cover and the avoidance to infiltrate of larger amounts of water into the landfill body (refer to (1) above). This eliminates a major LID strategy of infiltrating storm water at the project site.

The storm water treatment and management approach of the Lower site is illustrated in the Figure 2 below. Figure 2 serves as an example of interrelated storm water treatment system components used at the project site, which increase storm water treatment efficacy. A detailed description of the storm water approach can be found in **Appendix C of this Final SEIS**.

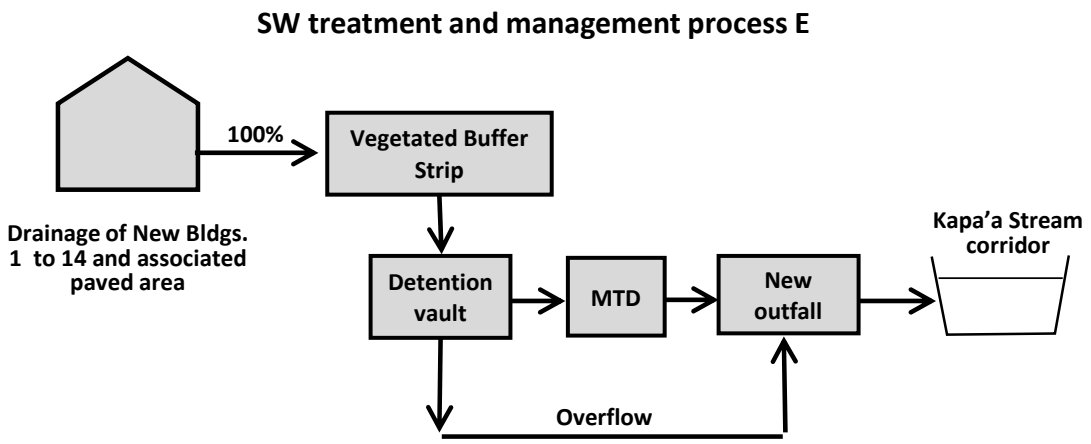


Figure 2: Storm water (SW) treatment and management approach used in the Lower project site (source Appendix F of this Final SEIS, Figure 1.3)

Four drainage areas within the Lower site will serve the Lower site, which will include a traffic area and 14 New buildings. Each of the drainage areas will be drained by the same type of storm water treatment and management process that is depicted in Figure 2. Under the depicted storm water treatment and management process, drainage from roofs and traffic areas will enter drain inlets which have debris separating screens that catch larger floatables and settleable. The runoff will be conveyed through drainpipes of up to 1,200 feet lengths to vegetated strips which are constructed above the below ground detention vaults. After flowing through the vegetated buffer strip, the runoff will enter the below ground detention vaults. The runoff in the detention vaults will be released over a period of 24 to 48 hours and will flow through the MTD units, where it is filtered. If the detention vaults are filled to capacity, the runoff the overflow from the four drainage areas will be conveyed to outfall structures that release the runoff to the Kapa'a Stream corridor. The armored outfall structure will be equipped with a rip rapped section that dissipates hydraulic energy and distributes the overflowing runoff evenly to a wider vegetated area within the Kapa'a Stream corridor. The flow through the MTD units will use separate discharge structures because of the different discharge elevations and the much smaller flow rates from the MTD discharge than through the peak rain event overflow.

The storm water process shown in Figure 2 shows the full build-out post-construction BMPs. During the construction process, which includes mass grading, erosion control BMPs will be use. These construction BMPs are described in the Storm Water Pollution Prevention Plan, which is part of the NPDES construction permit for the Lower site.

Response to General Comments and Questions (4):

(4) What is the expected velocity of stormwater coming out of the pipes into Kapa'a Stream during the dry season and wet season?

Response: This is a complex question since the storm water treatment and management approach at the project site consists of several strategies, each designed to fit site-specific needs. The emphasis of designing storm water treatment and management strategies has been to use LID storm water strategies to the extent the site conditions warrant.

A comprehensive description of the storm water treatment and management approach can be found in **Appendix C of this Final SEIS**.

While the selected method of storm water treatment has a high degree of pollutant removal efficacy, the second important function is to avoid stream bed erosion by lowering the storm water discharge flow rates. Lowering high discharge flow rates can be achieved by providing detention volumes with time delayed release. Detention vaults are presently used in the Upper site and are planned for the Lower portions of the project site.

As depicted in Figure 2 the storm water enters detention vaults which were designed to accommodate the water quality volumes of the design runoff event. The water volumes in the detention vaults are released over a time between 24 to 48 hours. This gradual release shaves off high discharge rates to the stream and therefore lowers the occurrences of stream bed erosion due to high runoff rates.

Since the entire Lower site, with the exception of small sections with trees and ornamental vegetation, will be paved and have impermeable roofs, all precipitation falling will run off. A small portion of the runoff will be lost to evaporation and evapotranspiration. This loss is reflected by the runoff coefficient used in the runoff calculation. The fact that most of the precipitation runs off the site has two aspects. One, it creates high demand on the storm water treatment and management system, and two, it safeguards that infiltration is avoided, which is a requirement to lower impacts from leachate from the landfill.

In response to the concrete question, a short summary is provided. More details can be obtained in the **Appendix C of this Final SEIS**. The drainage performance of Drainage area 1 is used to illustrate the drainage in the Lower site. Drainage area 1 is used since it has the largest detention vault (11,400 cbft) and the largest drainage area (5.6 acres).

In estimating the velocities of the drainage coming out of the "pipes" we must distinguish between (1) water discharged to the Kapa'a Stream corridor released from the detention vaults and flowing through the MTD for filtering, and (2) water bypassing the detention vaults during heavy rain events when the detention vaults are filled.

The discharge to the Kapa'a Stream corridor occurs through outfall structures that are designed to avoid stream bed erosion. This means that the end of the drainage pipe is equipped with flow control elements including stilling basins and rip-rapped areas that dissipates flow energy and slows down the water velocity by distributing it over a wider area. Both flow controls will slow the water, thus avoiding peak velocities coming out of a discharge pipe.

For the discharge from the detention vault (1) a period of 24 hours is selected which is at the shortest end of the required 24 to 48 hours and thus creates the highest flow velocities. The release of the total detention volume of 11,400 cbft over 24 yours causes a flow of 0.13 cfs (cubic foot per second). The flow will be distributed in a minimum 3 feet wide rip raps bed causing an expected flow velocity of 0.35 fps (foot per second). This slow flow rate will avoid soil erosion.

For the discharge during heavy rain events (2) the calculation model shown in **Appendix C** is used with the following data. Figure 3 shows the average rainfall at the project site, obtained from the Hawaii Rainfall Atlas. Figure 3 suggests a "wet season" from October through March and a "dry season" from April through September. Figure 4 shows the expected overflow of the detention vault in drainage area 1.

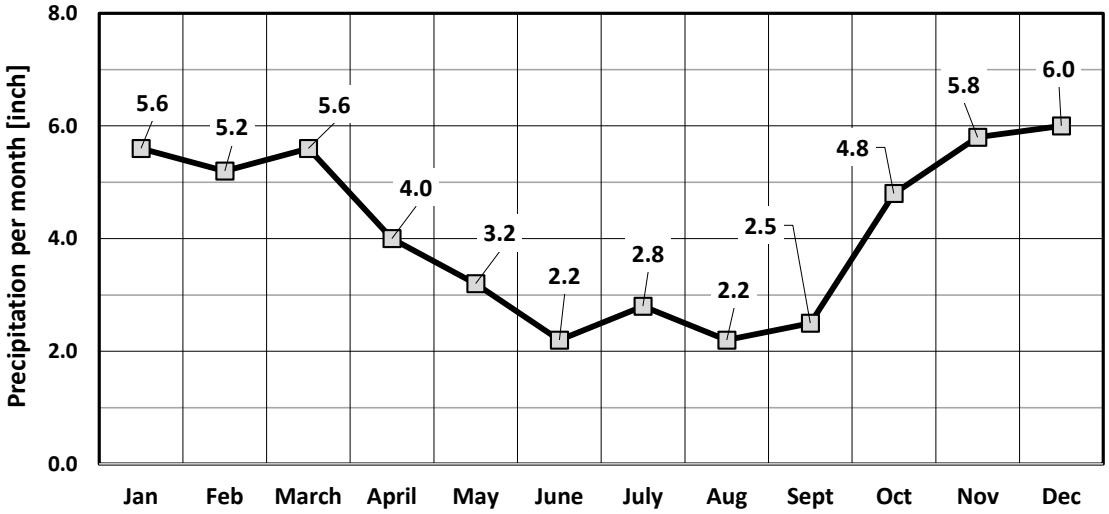


Figure 3: Average rainfall at the project site per month (source: Hawaii Rain Atlas) (source Appendix C of this Final SEIS, Figure 7.1)

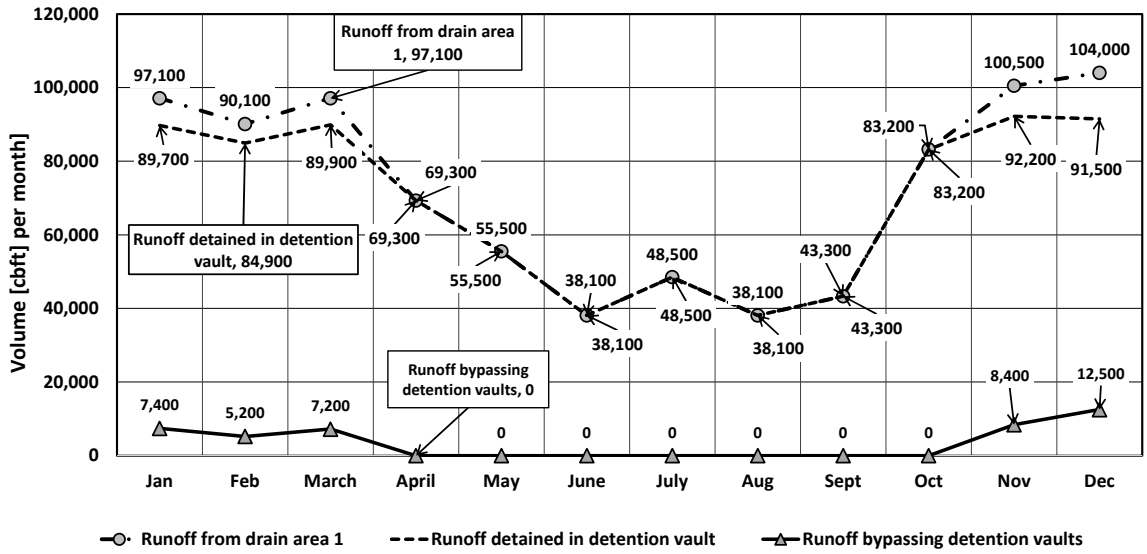


Figure 4: Estimate of the amount of runoff from drainage area 1 bypassing the detention vaults (source Appendix C of this Final SEIS, Figure 9.3)

Figure 4 indicates that the detention volume does not overflow in typical rain events during the dry season, thus all runoff will be collected in the detention vault. The highest expected overflow due to bypassing of the detention vaults would occur in December. Using the computer model presented in **Appendix C**, Section 9, under typical runoff conditions it is expected that the detention volumes will be bypassed an average of 7 times during that month. The highest and lowest overflow volume during these expected 7 events would be 360 and 2,800 cbft. Taking the highest overflow and assuming a design rain of 1.5 hours and applying a flow factor of 2.5, the highest overflow would be expected to be 1.3 cubic foot per second. This flow rate would occur after the detention vaults are filled and in the later phases of the rain event. The terminus of the overflow pipe will have a stilling basin whose function is to dissipate high flow energy and distribute the overflow on a wider downstream rip-rapped area, for final discharge to the Kapa'a Stream corridor. Assuming the width of the overflow weir of the stilling basin to be 7 feet, the overflow velocity would be approximately 0.75 foot per second (fps). This overflow velocity is not expected to cause soil erosion in the referred to rain events in the Kapa'a Stream corridor.

Response to General Comments and Questions (5):

> (5) What is the amount of stormwater that will be directed from each drainpipe per day into Kapa'a Stream during the dry season and during the wet season?

Response: **Appendix JC of this Final SEIS** provides a detailed description and analysis of the storm water system. The daily discharge is given by the example of the drainage from the Lower site. Table 1 shows the normalized daily discharges in cubic foot for the four drainage areas in the Lower site.

Table 1: Normalized daily discharges from the four draiange areas in the Lower site

			Discharge from Lower site			
Month	rain fall days per month [number]	Average rainfall [inch]	Drainage area 1	Drainage area 2	Drainage area 3	Drainage area 4
			average discharge per day [cbft]			
Jan	13	5.6	240	200	220	130
Feb	13	5.2	250	210	220	140
March	16	5.6	200	160	180	110
April	16	4	140	120	130	80
May	15	3.2	120	100	110	70
June	15	2.2	80	70	80	50
July	17	2.8	90	80	80	50
Aug	17	2.2	70	60	60	40
Sept	15	2.5	100	80	90	50
Oct	16	4.8	170	140	150	90
Nov	15	5.8	220	190	200	120
Dec	14	6	240	200	210	130
sums	182	49.9				

Response to General Comments and Questions (6):

(6) Over the years fill material has been brought in and spread over the lower section. How much rap and other fill material have been brought into the lower section since 2011?

Response: Relevant grading at the project site is limited to the Lower site. Within the Upper site, grading has been limited to creating a flattened base for the buildings, and typically no extra fill had to be brought to the project site except for fill to build the base course. Grading in the Lower site started in 2015 after the SMP (2014/SMA-27) was granted in September 2014. The grading was limited to creating even layers of the site and to smooth out elevation gradients in the Lower site. Grading has occurred since 2015 under a series of grading permits which were granted for smaller parcels of the Lower site.

The final grading permit to establish the proposed final grade is outstanding and will start under the conditions of the pertinent SMP permit. In response to this comment the following data is provided which is based on a cursory estimate relative to the last topographic report conducted in 2017:

Description	Unit	Amount
Area of Lower site that was graded to date.	Acres	14
Height of fill added, averaged over the entire Lower site	Feet	3
Approximate volume of fill brought to the site to	Cubic yard	48,000
Approximate portion RAO in fill		5%
	Cubic yard	3,300

The above data reflects an estimate and reported information and is not based on exact topographic data:

Response to General Comments and Questions (7):

(7) Has all the fill material brought onto the site been compacted?

Response: Yes, the fill has been compacted.

Responses to "Special Comments":

SPECIFIC COMMENTS:

(1) Require applicant to camouflage all new structures or hide them behind a screen of vegetation

(2) Require applicant to install a substantial capacity of photo-voltaic panels on all existing and new warehouses

(3) Require applicant to reinstate provision for trees between buildings to provide shade, reduce non-roof heat island effect, reduce noise, and capture storm water

(4) Require applicant to conduct the DOT and Unilateral Agreement required TIAR as part of the Final SEIS approval process

(5) Require on-site water monitoring wells

(6) Require that the industrial park hook up to the municipal sewer system to prevent directing all stormwater into the TMDL and Impaired Water Body Kapaa Stream, which runs into Class A waters of Kawainui Marsh and Kailua Bay

(7) Require that the drainage ditch at the foot of the lower portion of the industrial park property on the mauka side of Kapa`a Quarry Road be enlarged and regularly cleaned of all overgrowth, debris, and silt so that it is once again the receiving area for runoff from the former landfill site and serve as the designed filter for stormwater before it enters Kawainui Marsh

(a) Require applicant to identify permanent Best Management Practices especially designed for industrial parks that will be used

(b) Require applicant to create a Storm Drainage System maintenance plan which includes required quarterly reports to the DPP

(c) Require maintenance records detailing the frequency, quantity, and material composition of the material removed from the sediment basin

(d) Require quarterly maintenance records detailing pollutants from existing businesses within the Kapa'a Industrial Park and assessing the potential for pollutant reductions

(e) Require applicant to fully fund and install Oceanit/AECOS stream monitoring stations to monitor the quality of water flowing from the industrial park into Kapa'a Stream in perpetuity. Require one station to be located near the settling basin, one station in the middle section of the industrial park, one station in the lower section fronting Kapa'a Stream, and one monitoring station in the lower section at the ditch along Kapa'a Quarry Road

(8) Require that the applicant make explicit any changes and increases in pollutants from the new drainage and sewage system

(9) Require that the drainage and sewage systems be installed before any structures are approved

(a) This requirement is needed to prevent the applicant from changing the topography and coming back for additional changes later

(b) This requirement is needed to prevent the applicant from continually changing stormwater treatments. The FEIS states "The stormwater treatment system used in the DEIS design has changed from the design presented in the FEA." Now the SEIS claims that a soil analysis revealed the need to change the drainage system again.

Response to "Special Comments" , (1):

(1) Require applicant to camouflage all new structures or hide them behind a screen of vegetation

Response: Details about the referred strategies of camouflaging and hiding behind vegetative screens are described in detail in **Appendix G of this Final SEIS**. Both strategies are referred to as "visual impact mitigation." The **Appendix G** describes basically two types of visual impact mitigation (1) blending the facility into the surrounding environment applying selected color schemes, and (2) installing vegetative buffers with trees and shrubs that obstruct lines of sight on the facilities. Both visual impact mitigation strategies are used in the site development plans at the project site.

(1) Bending the facility into the landscape:

As **Appendix G** describes in detail, there are certain aspects to the landscape and visual components.

Landscape components:

Describing a landscape before and after the development allows these visual impacts to be assessed. Trying to capture the range of factors that make up an attractive landscape or a beautiful building is difficult and often depends on a viewer's personal taste. Visual impacts depend on physical elements of the landscape such as:

- Topography or landform (hills and slopes).
- Vegetation.
- Buildings
- Other land uses.

Visual components

Physical elements structure a landscape, and visual components provide a framework for the description of the landscape. Four basic visual components are frequently used. These are form, line, color, and texture:

- Form describes the shape of something, so hills may be rounded, jagged or rolling. Groups of buildings may be dense and regular, with a strong geometric pattern, or may have a less defined shape.
- Line considers boundaries and demarcation between areas. A rectangular block of trees planted on a hillside has a different appearance from an area of woodland that merges to scrubland and then open grassland with no distinct border. Variation of skylines affect the perception of landforms. An example is the perception of a development in front of either a mountainous skyline of a visible horizon. If tall buildings do not break the skyline, the mountains in the background dominate. If the buildings on the other hand obscures the hills behind the development is perceived as dominant.
- Color is an obvious aspect of a sight, with the hue of vegetation, bare earth or water being noticeable aspects. Contrasting colors may make certain features stand out and bring them to the viewer's attention. Color can be extended to include more subtle details, such as areas of

light and dark. Background, background lighting, shadows, sunlight, and reflections can alter the perceived colors.

- Texture reflects the nature of surfaces. This may be uniform or varied, smooth or rough. Turbulent water can be dramatic whereas a smooth pond is calming and promotes contemplation. The appearance of a woodland with many different species, sizes and ages of tree is different from a plantation of the same species.

The four basic visual components are affected by several factors:

- Variety: The four visual aspects may be uniform or may vary. There is no simple explanation of how much variation is good. Some developments may have buildings all the same style and have a pleasing harmony.
- Perceptions: The value of a scene to an individual generally depends on personal perceptions and preferences. What is attractive to one person may not be to another.
- Tranquility may be valued by some observers, who prefer a harmonious landscape. Other people may prefer a lively development of an urban setting. Some people value natural landscapes, or what they perceive to be natural landscapes, over areas where the influence of humankind is dominant.
- Other considerations: Visual appearance can also be influenced by other issues such as the benefit to society. Industrial and commercial developments bring employment and economic development. Therefore, the change a development affects in landscape may be accepted and even valued as a sign of progress. These developments can even become accepted as part of the landscape.

One further significant distinction is the distance of viewpoints from the facility for which visual impact mitigation is applied. The efficacy of mitigation strategies differs for short-distance and long-distance view. Further details of effective visual impact mitigation are described in **Appendix G of this Final SEIS**.

(2) Concealing the facility behind a screen of vegetation:

Vegetative buffer zones are used at the project site for visual impact mitigation at the present time.

The Upper portion of the project site has a row of high trees at the Eastern boundary. This lowers the visual impact from long-distance views.

The Lower site is presently surrounded on all four sides with existing vegetation, including larger trees. At the present, the Lower site is not visible from short-distance views, because of the vegetation at the boundary of the site, except at two locations with existing roadway entrances.

In the future the vegetative buffer zone around the Lower site will be enlarged, both in height and width, to provide a screen of vegetation for effective visual impact mitigation.

Further details of effective visual impact mitigation through vegetation at the site perimeter are described in **Appendix G of this Final SEIS**.

Response to "Special Comments", (2):

> (2) Require applicant to install a substantial capacity of photo-voltaic panels on all existing and new warehouses

Response: Existing and planned photovoltaic (PV) installations were already discussed in the responses to the DPP comments.

Under the existing laws the owner of the Kapa'a light Industrial Park (KLIP), the Applicant, cannot be required to install PV on the roof. In fact, the Applicant has expressed the desire to install more PV on warehouse roofs.

Presently, there is about 650 kW of roof top capacity installed at KLIP, on five warehouses. These were installed under the Feed in Tariff (FIT) program. The FIT program was terminated in 2017 and no more applications are accepted.

The Applicant would like to be in the position to install more PV capacity on the warehouse. If economically viable, the Applicant would like to be able to install as much PV capacity to create sufficient energy for the entire warehouse development. This would entail installation of PV rooftop on newer existing and on planned buildings.

Response to "Special Comments" , (3):

> (3) Require applicant to reinstate provision for trees between buildings to provide shade, reduce non-roof heat island effect, reduce noise, and capture storm water

Response: The Applicant has plans to add trees between building. Adding trees is required under ROH 21 Section 6 to provide shade for parking lots. More details about adding trees for parking lots at the Kapa'a site is in **Appendix F of the Final SEIS**.

In addition to adding tree for parking areas, the Applicant will plant trees for decorative purposes where space is available close to warehouse walls and when visual quality inside the site would benefit.

The benefits mentioned in comment (2), such as reduction of heat island effect and reduction of noise, also apply to the project site. Capturing storm water through trees does not apply to the project site because of the need to avoid significant infiltration. **Appendix F** describes more about the benefits of trees at the project site.

Response to "Special Comments" , (4):

> (4) Require applicant to conduct the DOT and Unilateral Agreement required TIAR as part of the Final SEIS approval process

Response: The Applicant has committed to carry out a TIAR which will update the finding of the last TIAR.

The Applicant has communicated with the accepting agency to carry out an updated Traffic Impact Assessment Report (TIAR) after the Final SEIS has been approved and before the construction in the Lower site can commence.

Response to "Special Comments" , (5):

(5) Require on-site water monitoring wells

Response: The Applicant has not been required to install or maintain on-site water monitoring wells. The reason for monitoring wells is primarily to assess groundwater characteristics, so that contaminated water is not used for irrigation or other water applications.

Under the full build-out development of the Lower site, the cover will be sealed to mitigate the creation of harmful leachate. Therefore, at full build-out, the development in the Lower site will not add to the possible pollutant load that affects the landfill body.

Response to "Special Comments" , (6):

(6) Require that the industrial park hook up to the municipal sewer system to prevent directing all stormwater into the TMDL and Impaired Water Body Kapaa Stream, which runs into Class A waters of Kawainui Marsh and Kailua Bay

Response: In the Draft SEIS, it was described that the project site is not connected to the municipal sewer system and that there are no plans to connect the project site in the future. Connecting to the municipal sewer would require a 1.6-mile pressure line for raw sewage to a take-over-point of the municipal sewer on Mokapu Blvd. From an earlier technical feasibility investigation, it was realized that the terminus of the existing sewer line at Mokapu Blvd., to where the project site would connect with the pressure sewer, only had limited capacity to accommodate raw sewage from the Kapa'a Light Industrial Park.

The alternative of treating the wastewater onsite with the selected advanced wastewater treatment technology has environmental benefits.

The EPA has published secondary treatment standards which apply to all Publicly Owned Treatment Works (POTW). For Biological Oxygen Demand (BOD_5) and total Suspended Solids (TSS), the 45-day average is 45 mg/l average for both. The selected advanced onsite wastewater treatment systems at the project site have been tested at the site and have average residual pollutant levels of both BOD5 and TSS values of 5-10 mg//l. This compares well with extensive tests that were conducted by the vendor and which were the basis for the NSG 350 certification of the MBR system. This suggests that the effluent of the selected MBR wastewater technology for the project site has significantly lower average residual pollution levels that the municipal central wastewater plants.

In addition to creating effluents with lower residual pollutant loads, onsite wastewater treatment saves significant amount of pumping power to covey the wastewater to the central wastewater treatment plant. Saving pumping power has a positive effect on environmental footprint.

The comment (6) suggest that the municipal sewer would be used for the disposal of storm water so that no storm water would be directed into the Kapa'a Steam. The use of combined sewer which

disposes of wastewater and storm water is technical doable solution but should be avoided. Only wastewater should be introduced to the municipal sewer system. Storm water should receive a separate treatment.

Response to "Special Comments" , (7):

> (7) Require that the drainage ditch at the foot of the lower portion of the industrial park property on the mauka side of Kapa`a Quarry Road be enlarged and regularly cleaned of all overgrowth, debris, and silt so that it is once again the receiving area for runoff from the former landfill site and serve as the designed filter for stormwater before it enters Kawainui Marsh

Response: **Appendix J of this Final SEIS** describes the conditions of the drainage ditch and proposes strategies to improve the present conditions. It should be noted that the Applicant cannot make final decisions about the Kapa'a Quarry Road and the adjacent drainage ditch. Although this section of the Kapa'a Quarry Road is on the Applicant's property, the City & County has an easement for both and thus is responsible for the maintenance.

The Applicant, however, has proposed a plan to improve the condition of the drainage ditch and he offers support to the City and County to implement the proposed modifications.

Under this proposed development the drainage ditch would be excavated and refilled with a layer of gravel. A vegetated swale would be installed above the new fill. Storm water runoff from the road and the adjacent land would enter the vegetated swale and would flow toward the Kapa'a Stream corridor. Stormwater would also percolate through the vegetated swale, enter the fill below and either infiltrate into the surrounding soil or enter a drainage pipe which conveys it toward the Kapa'a Stream. A new combined pathway for pedestrians or bikers could be constructed, also serving as a maintenance road for the vegetated swale. The proposed pathway would have a pervious gravel pavement.

Response to "Special Comments" , (7) (a)

> (a) Require applicant to identify permanent Best Management Practices especially designed for industrial parks that will be used

Response: The Applicant has identified BMPs for the construction and post-construction period, both structural and non-structural BMPs will be used. The proposed BMPs were disclosed to the DPP in the form of various Strom Water Strategic Plans and to the DoH as Storm Water Pollution Prevention Plans for the NPDES permits. The following is a list of BMPs which will be used in the post-construction storm water design and the pollution prevention program for construction. The selected BMPS include:

Illicit Discharge Detection and Elimination Program

- Trash and Illegal Dumping
- Used Oil Recycling Program
- Illegal Dumping Control
- Trash and Debris Management

- Decentralized Wastewater
- Preventing Septic System Failure

Construction

Project Oversight

- Construction Phase Plan Review
- Contractor Training and Certification
- Following Local Ordinances for Construction Site Runoff Control
- Construction Inspection Program

Construction Site Planning and Management

- Construction Sequencing
- Construction Site Operator BMP Inspection and Maintenance
- Land Grading
- Preserving Natural Vegetation

Erosion Control

- Chemical Stabilization
- Compost Blankets
- Dust Control
- Geotextiles
- Gradient Terraces
- Riprap
- Seeding
- Sodding
- Wind Fences and Sand Fences
- Check Dams
- Temporary Diversion Dikes

Sediment Control

- Filter Socks
- Construction Entrances
- Fiber Rolls
- Filter Berms
- Sediment Basins and Rock Dams
- Sediment Filters and Sediment Chambers
- Sediment Traps
- Silt Fences
- Storm Drain Inlet Protection
- Vegetated Buffers

Good Housekeeping/Materials Management

- Concrete Washout
- General Construction Site Waste Management
- Spill Prevention and Control Plan
- Vehicle Maintenance and Washing Areas at Construction Sites

Post-Construction

General

- Site development Program Elements
- BMP Inspection and Maintenance

BMPs for Site Plans

- Conservation Easements
- Eliminating Curbs and Gutters
- Green Parking
- Vegetative buffer strips
- Infrastructure Planning
- Low Impact Development
- (LID) and Other Green Design Strategies

Open Space Design

- Protection of Natural Features
- Riparian/Forested Buffer
- Street Design

  Urban Forestry Infiltration (only on the site perimeter berms) Filtration

- Bioretention (Rain Gardens)
- Catch Basin Inserts
- Sand and Organic Filters
- Vegetated Filter Strip
- Manufactured Treatment device (MTD)

Detention

- Dry Detention Vaults
- In-Line Storage
- On-Lot Treatment

Response to "Special Comments", (7) (b)

> (b) Require applicant to create a Storm Drainage System maintenance plan which includes required quarterly reports to the DPP

Response: **Appendix E of this Final SEIS** is a Draft maintenance and operations plan for the storm water BMPs. The applicable agency will review and accept or ask for additions in the detail design phase of the storm water system.

Response to "Special Comments", (7) (c)

> (c) Require maintenance records detailing the frequency, quantity, and material composition of the material removed from the sediment basin

Response: The applicable agency will define the scope of the maintenance records.

Response to "Special Comments", (7) (d)

> (d) Require quarterly maintenance records detailing pollutants from existing businesses within the Kapa'a Industrial Park and assessing the potential for pollutant reductions

Response: The applicable agency will define the scope of the maintenance records.

In addition to reporting to the agency, the Kapa'a Management has implemented an internal storm water pollution prevention program. The internal program maintains the required source control measures for the NPDES No Exposure Certification. Under this internal program, the Kapa'a Management inspects the tenant's compliance with the conditions of the storm water pollution program. In the event that tenants are not compliant, first notices are sent to applicable tenants to rectify the shortcomings / violations. The second level is a warning to face eviction of the violations are not rectified. This program has been successful in reminding tenants that storm water pollution prevention is a top priority.

Response to "Special Comments" , (7) (e)

> (e) Require applicant to fully fund and install Oceanit/AECOS stream monitoring stations to monitor the quality of water flowing from the industrial park into Kapa'a Stream in perpetuity. Require one station to be located near the settling basin, one station in the middle section of the industrial park, one station in the lower section fronting Kapa'a Stream, and one monitoring station in the lower section at the ditch along Kapa'a Quarry Road

Response: The decision whether to install stream monitoring stations and the scope of such an installation rests with the applicable agency. It must be noted that the water quality in the Kapa'a Stream is affected by various operations in the Kapa'a valley. The Kapa'a Light Industrial Park does not bear responsibility alone.

In fact, with the implementation of the post-construction BMPs and LID site development approach, the impact of the storm water runoff from the project site will decrease from the present condition. In accordance with the TDML records, much of the TSS load comes from upland sources in the Kapa'a Valley, including the quarry.

In addition, the requirement to implement the product of a particular vendor does not seem justifiable.

Response to "Special Comments" , (8)

> (8) Require that the applicant make explicit any changes and increases in pollutants from the new drainage and sewage system

Response: The design of the site development has been transparent with all agency stakeholders. In the past proposed changes by the Applicant to the agencies about site development approaches and technologies were either been accepted or rejected, prompting a redesign of certain site elements. This has helped to keep a high quality of the site development design process.

Response to "Special Comments" , (9)

> (9) Require that the drainage and sewage systems be installed before any structures are approved

Response: The applicable permit process is that design drawings are approved, and permits issued before construction can commence. This includes wastewater systems and storm water treatment systems. All permitted storm water and wastewater structures and systems must be installed before the building can be occupied.

Response to "Special Comments" , (9) (A)

> (a) This requirement is needed to prevent the applicant from changing the topography and coming back for additional changes later

Response: The topography is delineated in grading permits. To date, the Applicant has been issued several grading permits for the construction of warehouses, both for the Upper and the Lower sites. The scope of grading is delineated in these grading permits, which might also have associated grubbing and stockpiling permits.

To date the Lower site has been graded under existing grading permits. The grading to date was done mainly to flatten out the site, making it suitable for outdoor storage and applying layers of gravel to facilitate the movement of vehicles and replace smaller soil fractions on the surface.

Response to "Special Comments" , (9) (b)

> (b) This requirement is needed to prevent the applicant from continually changing stormwater treatments. The FEIS states "The stormwater treatment system used in the DEIS design has changed from the design presented in the FEA." Now the SEIS claims that a soil analysis revealed the need to change the drainage system again.

Response: The design of the storm water treatment and management system has been going through changes over the years. The need to change the storm water design approach was based on the necessity to comply with changing permit requirement and adapt the detail design to design intelligence that was gathered in the detail engineering phase. In the past years, the storm water related permit

requirements have gone through considerable change, and more emphasis is now placed on using Low Impact Development (LID) strategies.

In responding to this comment, it is pertinent to discuss the background of the changes of the storm water treatment and management system of the Lower site over the past seven years. There might have been a misunderstanding of the necessity to change the storm water design of the Lower site.

Following the acceptance of the 2011 FEIS, a Special Management Area Use Permit (SMP) was obtained in 2014. The concept of the storm water system was accepted under the SMP. Figure 5 shows the 2014 schematics of the storm water management system planned for use at the Lower site. There were four drainage areas inside the Lower site from which storm water runoff would be collected and subsequently treated. The drainage areas A, B and C would have had similar treatment approaches. In these three drainage areas, the storm water runoff would enter the conveyance systems by first flowing through a small catchment where larger portions of floatables and oil are separated from the runoff. The storm water would then be conveyed to sedimentation catchment units where much of the suspended solids as well as remaining floatables and oil / grease are removed. The pretreated runoff would then flow into rainwater catchment vaults. From here the harvested rainwater would be supplied to irrigation of landscaped areas and vegetative buffer zone by means of irrigation pumps.

When the rainwater catchment was filled, the runoff would be diverted to the storm water detention vaults from where detained runoff was released to the Kapa'a Stream corridor over 24 to 48 hours. In rare occasions the detention vault might be filled and then the storm water would be conveyed directly to the Kapa'a Stream corridor, bypassing the detention vault. Both the rainwater harvesting vault and the detention vault would be built underground. The vaults would be located underneath parking areas.

The drainage approach of the base yard would differ from drainage areas A, B and C. The runoff from the base yard would flow to an oil and grease separator, and then conveyed through a bio swale to the pre-treatment unit of drainage area C. The bio swale would include selected plants that could absorb certain pollutants such as heavy metals. The plants in the bio swale would be periodically removed or cut low and removed from the site.

During the detailed site development design phase, the following potential shortfalls of the present stormwater management approach were identified:

1. The planned finish grade as presented in the approved SMP 14-222 is marginal to provide an adequate hydraulic discharge gradient for the stormwater collected in the detention basins.
2. The selection of the type of below-ground detention basins predated the more stringent requirements of Low Impact Development (LID) stormwater measures delineated in the DPP Rules Relating to Storm Drainage Standards" as amended in 2013.

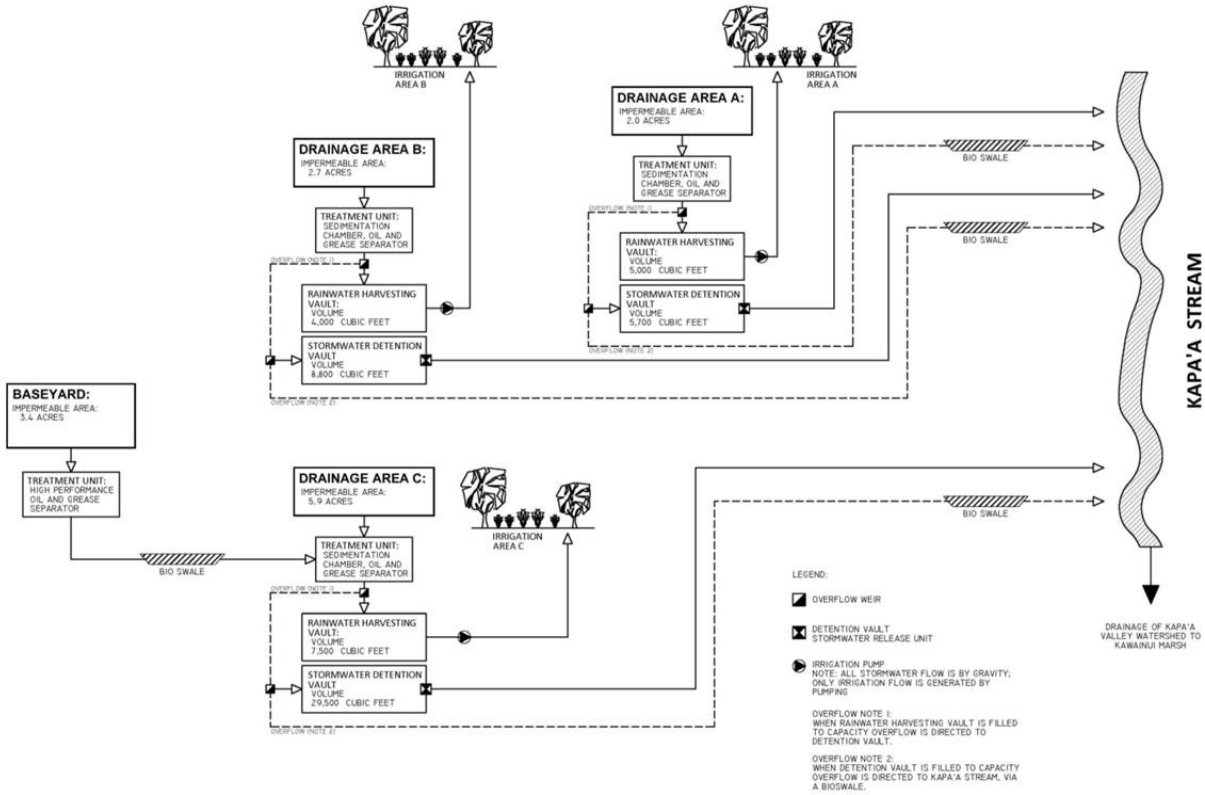


Figure 5: Storm water management and treatment systems at the Lower site; part of the accepted SMP 14-222 (Major) (source: 2014 SMP application, Figure 3.9)

In 2017, a Minor Modification Application for the SMP 14-222 (Major) was submitted which included a revision of the storm water treatment and management. It was considered that the storm water system under the SMP 14-222 (Major) permit did not have effective treatment downstream of the detention vault. New permit requirements were in effect at the time in 2017 when the Minor modification was submitted.

The main modifications to the stormwater treatment and management system as delineated in the SMP 14-222 (Major) included the following design concepts:

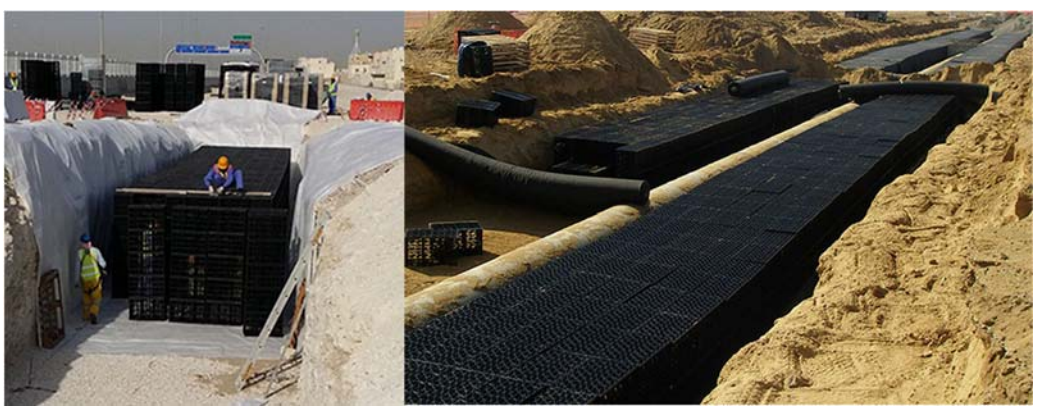
- In adopting Low Impact Development (LID) Stormwater strategies, an approach was considered to add infiltration as a specific LID process in a way that would still satisfy the avoidance of infiltration into the landfill, which would create leachate related impacts. Thus, a system was developed that would release the storm water below ground in lieu of the detention and subsequent surface release of the detained stormwater, as described in the earlier storm water system approaches. In the new approach with infiltration, stormwater infiltration would occur from below ground vaults with pervious surfaces. These vaults would be located at the site perimeter. Sufficient soil would be added, and therefore infiltration would occur into new fill and not the landfill body. A layer with low-permeable soils would be installed below the new added fill, thus directing the infiltrated water toward the perimeter berms and offsite, avoiding contact

with the existing landfill material. This approach was consistent with the Applicant s commitment of avoiding infiltration of precipitation within the inner site area.

- Infiltration of stormwater would occur through below-ground infiltration tanks which were structurally supported by plastic modular elements with a high void ratio. The void ratio of the modular tanks would be significantly higher than conventional rock filled infiltration trenches. This had the benefit of a smaller structural footprint.
- A vegetated swale, a LID stormwater measure by itself, would be installed above the infiltration tank. Water in the vegetated swale would percolate through the soil and enter the infiltration tank and would eventually infiltrate in the adjacent substrate and migrate underneath the site perimeter berms towards an existing drainage canal.
- Pretreatment units were planned upstream of the vegetated swale and infiltration tanks. These pretreatment units reduced the amount of suspended solids as well as oil and grease entering the vegetated swale and infiltration tanks.
- A rainwater harvesting system was integrated into the stormwater management system. Rainwater would be collected from rooftops of selected building and would be stored in below-ground tanks. When the rainwater tank overflowed the runoff from the roofs would be discharged to the stormwater drainage area on the traffic areas. The design of the rainwater harvesting tanks was similar to the infiltration tanks, with the difference that an impermeable liner confined the collected water in the rainwater tanks and avoid losses through infiltration.
- The sizing of the rainwater harvesting tanks was based on precipitation and evaporation rates.

Figure 6 shows the type of below-ground modular infiltration tanks that would be used. Figure 7 illustrates the combination of a vegetated swale with the below ground the modular stormwater infiltration tank. Runoff from the site would flow to the vegetated swale and percolate through an engineered soil into the infiltration chamber. As the water infiltrated into newly filled soil water would migrate through the soil underneath the new site perimeter berms toward the drainage ditch.

Figure 8 shows a detailed illustration of the combination of vegetated swale and infiltration vault below the swale.



(a) The black elements are the structural modules which are wrapped in a geotextile fabric.

(b) The pipe in the middle is the overflow of the vegetated swale.

Figure 6: Example of a below-ground stormwater infiltration and storage system. (Eco Tank)

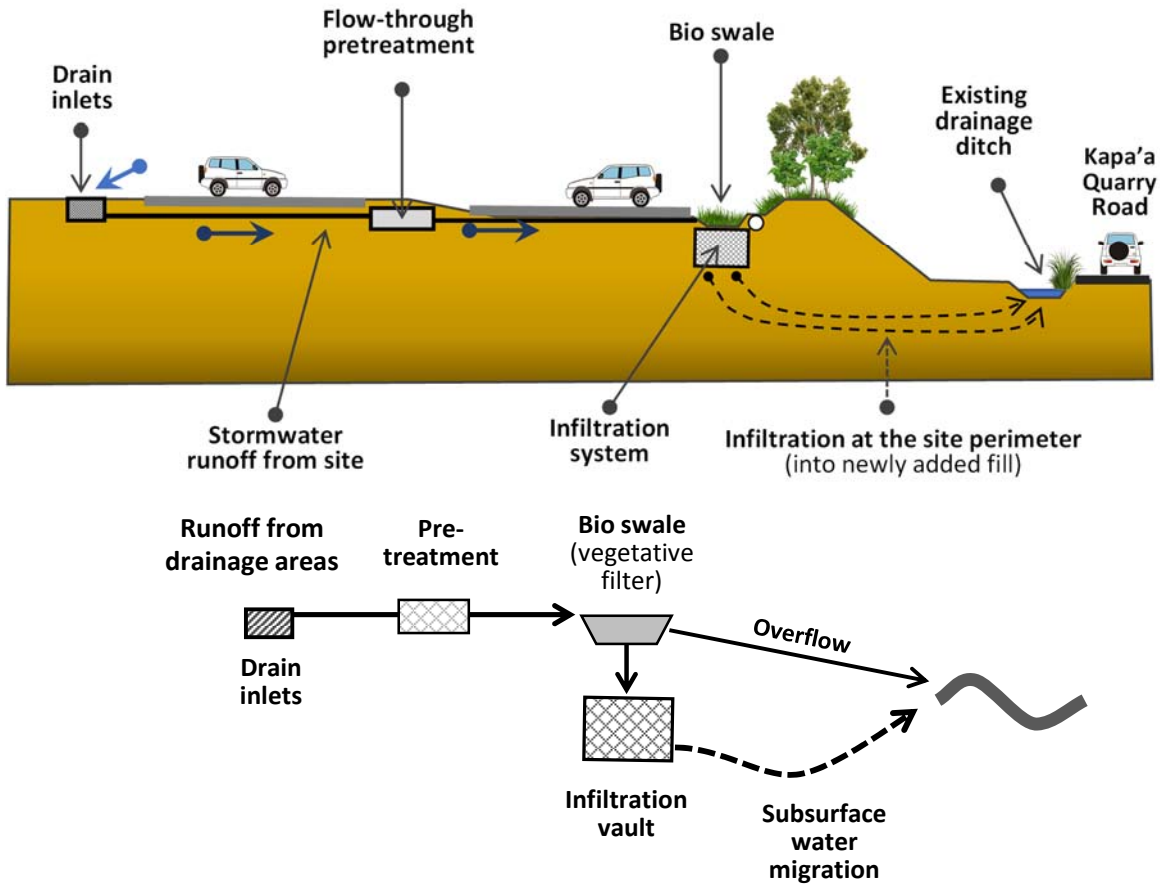


Figure 7: Storm water treatment process with combination of vegetated swale and infiltration

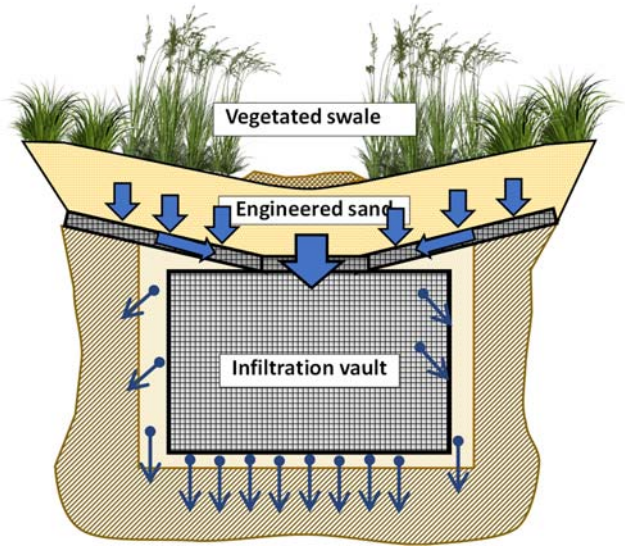


Figure 8: Combination of vegetated swale and infiltration vault

During the detail engineering phase, a detailed soil study was done, and the expert suggested that the proposed infiltration of the water adjacent and upstream of the site perimeter berms, and subsequent migration below the perimeter berm toward the drainage ditch, faced the following technical challenges:

- A 2019 soil engineering report sponsored by the Applicant suggested that subsurface movement of significant volumes of water underneath the site perimeter berms could cause instabilities of the earth berms. Thus, creating a safety concern.
- The condition of the drainage ditch along the Kapa'a Quarry Road had deteriorated in its ability to convey water that would enter the drainage ditch after migrating under the site perimeter berm. This possibly could cause significant flooding on the Kapa'a Quarry Road if the water could not be conveyed to the Kapa'a Stream, another safety concern.

These design considerations led to the new storm water design presented in this SEIS. The new storm water treatment and management system described in the Final SEIS proposes conveying the runoff from the project site to multiple treatment facilities at the Northern site perimeter, and subsequent release to the Kapa'a Stream corridor through several outlets. The implementation of this comprehensive storm water treatment train will provide effective removal of pollutants in the storm water. The discharge of the treated storm water runoff through multiple outlets will provide a more distributed release to the Kapa'a Stream corridor, resulting in better flood control and avoidance of stream erosion.

Responses to "Recommendations to DPP" , (1) (a) through (f)

RECOMMENDATION TO DPP - Request that DPP does not approve the SEIS for the following reasons:

(1) The proposed plan directs all stormwater in the lower portion into Kapa`a Stream, which is a Total Maximum Daily Load (TMDL) stream and is listed as an Impaired Water Body under the Clean Water Act §303 (d) that drains into the Class 1A waters of Kawainui Marsh, which drain into Kailua Bay

(a) TMDL is a regulatory term in the U.S. Clean Water Act, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards

(b) The objective of a TMDL is to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken, and water quality standards achieved

(c) MDL stands for "Total Maximum Daily Load". A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can accept and still meet the state's Water Quality Standards for public health and healthy ecosystems

(d) "The City will assist DOH in engaging the surrounding land users to determine if there are additional opportunities to alter existing business practices to realize pollutant load reductions via education and outreach." (Implementation and Monitoring Plan for Kapaa Stream Wasteload Allocation for the City and County of Honolulu Municipal Separate Storm Sewer System NPDES Permit No. HI S000002 June 2015)

(e) There does not appear to be any TMDLs specifically assigned to either individual businesses within the industrial park or the industrial park as a whole beyond those identified as "industrial" in the Total Maximum Daily Loads (TMDLs) for Total Suspended Solids, Nitrogen and Phosphorus in Kapa'a Stream Kailua, Hawaii DOH Environmental Health Administration 2007 report.

- Has the TMDL for the industrial park been updated since the park has expanded since 2007?
- Does the industrial park and/or individual businesses within the industrial park have a TMDL assigned to them?

(f) On October 16, 2013, the EPA issued the City Department of Environmental Services a Notice of Apparent Violation (NAV) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4). Under the notice of violation Load Reductions to Achieve Kapa'a Stream TMDLs, the industrial park was required to reduce TSS, TGN, and TP.

- Has the industrial park met the EPA's required reductions?

Response to (1): It is correct that the Kapa'a Stream is a 303-listed inland water. The stream has been identified as an "impaired water" by the State.

Response to (1) (a) through (c): No response as statements are correct.

Response to (1) (d): The Applicant is following the State and County ordinances and guidelines to implement measures to lower impacts on the Kapa'a Steam. These measures are structural and non-structural BMPs. The Applicant uses LID storm water treatment and management strategies to the extent possible to comply with new County storm water rules. The Applicant has implemented a comprehensive source control program for the existing development to comply with conditions of the NPDES No Exposure Certification. The NPDES No Exposure Certification will also be obtained for all new buildings at the project site. The source control addresses the avoidance of rainwater impinging on outdoor stored material and process equipment which could entrain pollutants and discharge them to the receiving waters.

Response to (1) (e): In accordance with the 2018 DoH report on Statewide water quality there has been no update to the 2007 assigned TMDL for the Kapa'a Stream. No TMDL values have been assigned to individual businesses of the KLIP.

Response to (1) (f): The Applicant has lowered TSS, TN, and TP through the structural and non-structural BMPs in the Upper portion of the project site. The implementations of the new storm water treatment trains in the Lower site will significantly reduce TSS, TN, and TP concentrations in the runoff. The new advanced onsite wastewater treatment technology which will be implemented for all new buildings will significantly reduce TSS, TN, and TP concentrations in the wastewater effluent.

Responses to "Recommendations to DPP" , (2)

(2) The industrial park presently contributes about 16% of the entire Kapa`a watershed TSS baseload and directing all stormwater will increase the contaminants

Response: The origin of the present TSS load is considering the existing soil conditions, especially in the Lower site. Surface runoff and the emergence of leachate contributes to the present TSS loading. The TSS loading will be reduced due to stabilizing all surfaces and the implementation of the advanced storm water treatment train. While the manufacture treatment device (MTD) has a certified TSS reduction above 80%, the combination of the MTD with the vegetated buffer strip, detention vaults and other pretreatment device will increase the expected TSS removal rate even higher.

Responses to "Recommendations to DPP" , (3)

(3) At present the water quality of Kapa`a Stream is primarily affected from high TSS content. This causes related consequences of higher turbidity in Kawainui Marsh

Response: The reduction of TSS concentration in the runoff and the avoidance of stream bed erosion are both measures that will reduce turbidity in the Kapa'a Stream. Both types of impacts are presently mitigated and will be continued to mitigate by the existing and future new storm water treatment and management systems.

Responses to "Recommendations to DPP" , (4)

(4) During intense storms water levels in the stream increase and can cause the transport of sediments and other pollutants to the downstream wetland and marsh

Response: Flood control is an important aspect of achieving good water quality. Typically, LID storm water strategies require that storm water be detained at the site through infiltration into soil. This natural detention reduces the peak runoff rates, which are responsible for stream erosion and associated environmental impacts. The implementation of significant detention volumes at the project site and the ability to control the release of the detained runoff over a period between 24 and 48 hours will help to keep peak discharge rate low.

Responses to "Recommendations to DPP" , (5)

> (5) Elimination of trees in the inside of industrial park increases impervious surfaces, eliminates shade for people and buildings, and eliminates the capacity to store and reuse stormwater by half

Response: Planting trees inside the project site is a measure that will be implemented for new buildings. In fact, trees are a required element of providing parking spaces**. Appendix F of this Final SEIS** describes design measures that will implement trees.

Besides providing shade, trees are commonly used elements for storm water treatment and management in parking lots. Under the design approach presented in **Appendix F,** only precipitation on the planting area around trees provide will have infiltration capacity. The planting area around trees will not receive runoff from the adjacent paved traffic areas.

Trees will receive irrigation from harvested rainwater, and a portion of this will infiltrate into the soil below. Trees also lose storm water through evapotranspiration.

At the project site, storm water treatment through trees cannot be applied to the extent possible at sites with regular soils because of the landfill conditions which should not receive significant amounts of infiltration. **Appendix F of this Final SEIS** describes this aspect in further detail.

Responses to "Recommendations to DPP" , (6) and (7)

> (6) Converting 27 acres in the lower portion from pervious to impervious increases captured and non-captured stormwater runoff which, under proposed modifications, the flows are directed to Kapa`a Stream
> (7) Severe environmental impacts on Kapa`a Stream and Kawainui Marsh from paving over 147,000 square feet for new warehouses and parking spaces and directing all stormwater to the stream

Response: Of the 25-acre lower project site, around 19 aces will be converting from pervious to impervious. The rest will remain pervious land at the site perimeter that will create vegetated buffer zones.

The Kapa'a Stream provides most of the drainage of the Kapa'a valley. At the present time, quantities of rainwater infiltrates into the land fill body, especially in the Lower site. The infiltrated rainwater creates leachate that will either emerge at the base of the landfill and add to the surface discharge, or will percolate toward the Kawainui Marsh, carrying with it the pollutants that cannot be removed by the downstream soil.

As was mentioned earlier, LID storm water strategies typically recommend infiltration into the site. Since the project site is a former landfill where infiltration should be avoided, converting pervious to impervious surface cover is beneficial and a required design aspect addressed in the zone change conditions.

The planned storm water treatment and management system for the Lower site will address the aspect of flood control through the implementation of significant detention volumes.

Responses to "Recommendations to DPP" , (8) (a) though (g)

(8) Visual impacts from 15 warehouses 5,000+ to 24,000+ square feet and 40 feet tall

(a) There are no topographic maps in the SEIS showing the height of the lower portion before the land was purchased for an industrial park, the existing height after the owner put in unknown yards of soil and rock, and the finished height of the lower section when increased by 40-50 feet

(b) Just as the transfer station and lights are visible from multiple areas of Kailua, so will this new section with 15 warehouse structures, roofs, and associated lights.

(c) "Tall" trees on top of a perimeter berm to hide the warehouses take a long time to grow and could be cut down and die thus leaving the warehouses visible from all areas of Kailua. Berm will be about 2 feet higher than the full buildout interior site finish grade

- How many "tall" trees will be planted on top of the berm? What type of trees will be used?
- Given that the ground is raised 50 feet and will have 40-foot-tall warehouses on top, what is the anticipated height of the trees that will hide the warehouses from being visible throughout Kailua?

(d) Kawainui Marsh is at 3 feet above sea level. Before being used as a city dump, this section was part of Kawainui Marsh and at about 3 feet above sea level.

(e) The SEIS does not show any views from Kapaa Quarry Road looking up at 50+ feet with 40-foot buildings on top

(f) Without exact information on final finished grade for lower section, but using the proposal's words to increase the height to 40 or 50 feet, calculates to approximately 15,000 semi-trucks that will be needed to bring in approximately 2.22 million cubic yards of material.

(g) The SEIS does not identify the source(s) of where the fill material will come from, the type(s) of fill material that will be used or allowed, how much fill will be needed to reach the 50-foot height, whether the fill material will be tested before being allowed on the lower section, and what types of permits are needed to bring in fill material.

Response to (8) (a): **Appendix D of this Final SEIS** shows topographic renderings of the existing and the full build-out grade. The elevation sections in **Appendix D** show the height of the planned buildings in relationship to the proposed full build-out grade and the existing grade.

Response to (8) (b): **Appendix G of this Final SEIS** describes measures to lower the visual impact of the project site. The **Appendix G** specially addresses the impacts of long-distance view across the Kawainui Marsh and preferred mitigation measures.

As described in **Appendix G** visual impact mitigation of facilities can be done by applying color and/or textures to the facility or building façade. The goal is to achieve optical effects which blend the facility into the background environment. **Appendix G** describes that long-distance views can best be mitigated by applying a suitable color scheme.

As the comment under (b) suggests, the present negative visual impact of the Kapa'a Transfer station is an indication of the expected visual impacts of the future development in the Lower site. **Appendix G** presents the example of the present visual impact of the Kapa'a Transfer station and the ability of lowering visual impact through appropriate color scheme applications. Figure 9 illustrates the effect on visual impact for long distance views by applying color schemes to buildings. The image (a) shows long a distance view of the Kapa'a Transfer station with existing color scheme and (b) using a simulated long-distance view with a color scheme matching background color.

(a) Long distance view for a building with **Existing colors** for the building façade and roof

(b) Long distance view for a building with **B = Simulated colors** for the building façade and roof

Figure 9: Lowering visual impact of long-distance views by color schemes (Source Appendix G, Figure 8.2).

The same approach to lower visual impact would be applied to the development in the Lower site. As was mentioned before, the Upper site is already hidden from views from view from Kailua and across the Kawainui Marsh by a scree of tall (larger than 40 feet) trees. Regarding light emitted from the development in the Lower site, the **Appendix H of this Final SEIS** describes light pollution measures.

Response to (8) (c):

(c) "Tall" trees on top of a perimeter berm to hide the warehouses take a long time to grow and could be cut down and die thus leaving the warehouses visible from all areas of Kailua. Berm will be about 2 feet higher than the full buildout interior site finish grade

- How many "tall" trees will be planted on top of the berm? What type of trees will be used?
- Given that the ground is raised 50 feet and will have 40-foot-tall warehouses on top, what is the anticipated height of the trees that will hide the warehouses from being visible throughout Kailua?

Response: The comment that "trees typically take a long time to grow" is correct. There are two design scenarios that address the issue of time to grow trees on the site perimeter, time to plant the tree and type of trees.

First, the site development design goal is to commence grading of the finish grade as soon as possible. A priority and one among first objectives of the grading to finish grade elevation will be the construction of the site perimeter berms. This will be hand in hand in planting vegetation including trees and shrubs. Planting the trees before the buildings are erected will provide time for the trees to grow.

Second, **Appendix I of this Final SEIS** describes the development concept of the vegetated buffer around the Lower site. The **Appendix I** describes which type of trees should be planted at the site. The preference, endorsed by DLNR, is to have native or adaptive trees, grow quickly and provide a wide body for an effective vegetation screen.

As **Appendix G of the Final SEIS** indicates, visual impact mitigation for long distance view will be mainly through the application of color schemes that blend buildings into the adjacent environment. Trees

planted on the perimeter berms will add to the visual impact mitigation by creating a natural texture. The final color selection for the building's façades will occur in a field studies.

Response to (8) (d): This information is assumed be correct.

Response to (8) (e):

(e) The SEIS does not show any views from Kapaa Quarry Road looking up at 50+ feet with 40-foot buildings on top

Response: **Appendix G of this Final SEIS** shows visual impact mitigation measures for short-distance views from adjacent roadways, the Kapa'a Quarry Road, and the Kapa'a Quarry Place. **Appendix G** shows representative cross sections that indicate the required height of trees on the site perimeter to hide the new buildings.

Figures 11 through 14 show two representative cross sections for the Kapa'a Quarry Road and the Kapa'a Quarry Place, respectively. These two cross sections are examples of the effectiveness of reducing the visual impact from short-distance view. The cross sections indicate the line of sight with and without trees planted on the site perimeter berms. The required height of the trees is also indicated. Figure 10 indicates the locations of the cross sections A and B shown in Figures 11 and 14, respectively.

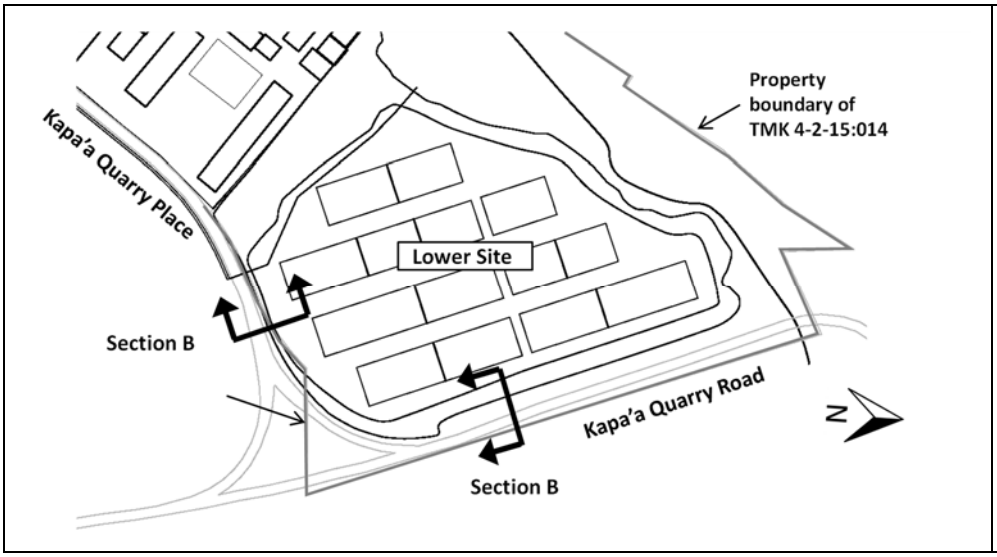


Figure 10: Locations and orientations of representative cross section A and B through the proposed site perimeter berm

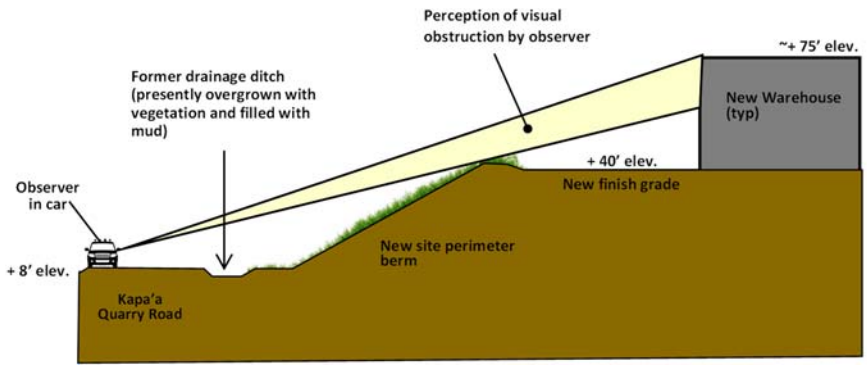


Figure 11: Cross-section A **without** trees on the new Eastern site perimeter berm (section drawn to scale) (Source Appendix G, Figure 7.8).
The lines of sight intersect with the upper parts of the buildings which are next to the Eastern site perimeter. Therefore, without vegetation the site perimeter berms cannot cover all the buildings.

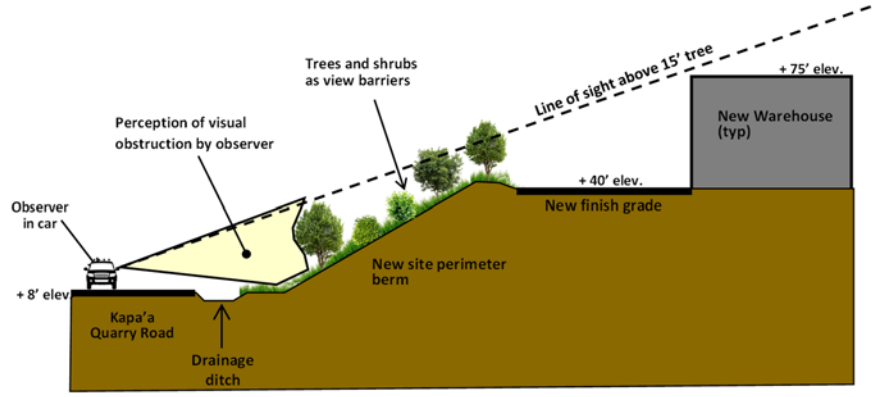


Figure 12: Cross-section A **with** trees on the new Eastern site perimeter berm (section drawn to scale)
(Source Appendix G, Figure 7.9).
With trees on the top of the berms buildings are concealed from the view.

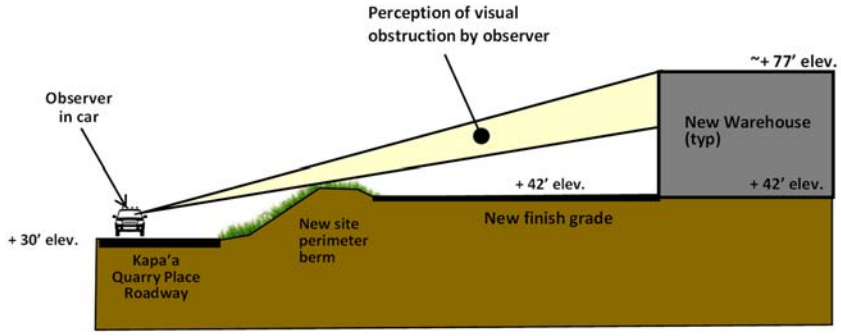


Figure 13: Cross-section B **without** trees on the new Eastern site perimeter berm (section drawn to scale) (Source Appendix G, Figure 7.8).
The lines of sight intersect with the upper parts of the buildings which are next to the Eastern site perimeter. Therefore, without vegetation the site perimeter berms cannot cover all the buildings.

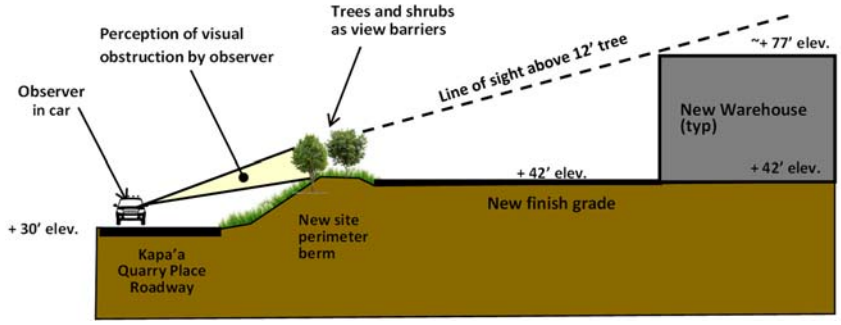


Figure 14: Cross-section B **with** trees on the new Eastern site perimeter berm (section drawn to scale)
(Source Appendix G, Figure 7.9).
With trees on the top of the berms buildings are concealed from the view.

Response to (8) (f):

> (f) Without exact information on final finished grade for lower section, but using the proposal's words to increase the height to 40 or 50 feet, calculates to approximately 15,000 semi-trucks that will be needed to bring in approximately 2.22 million cubic yards of material.

Response: The finish grade elevations are provided in the Draft SEIS and in the **Appendix D of this Final SEIS**.

The finish grade elevations will between 40 and 50 feet. Using the finish grade as indicated the average increase over the existing grade is 15 feet. The increase of finish grade over the existing grade varies over the entire site. Figure 15 illustrates the distribution of the height of the fill that must be added to the existing grade. The results depicted in Figure 15 were obtained by a grid model that was developed for the project site. The results of the grid model indicate the amount of net fill to be approximately 450,000 cubic yards (cby).

									7	18	22														
							-2	6	13	16	19														
					3	7	10	10	11	13	15	17													
					11	7	7	8	9	12	12	13	16	20											
					6	-2	1	8	9	11	11	12	13	16	19										
-3	-2	0	1	1	6	3	6	10	10	11	11	12	14	16	18										
-7	-5	-2	3	7	10	11	12	13	13	14	14	14	16	17	18	18	19	24							
-8	-3	0	5	9	11	13	13	14	16	16	17	17	17	18	18	18	18	21	25						
-6	-2	2	7	9	11	13	14	15	16	16	16	17	18	18	18	18	18	18	22	25					
-4	-2	2	7	8	10	12	14	15	16	16	16	17	17	18	18	18	17	17	18	22					
-3	-2	3	8	10	11	12	13	14	15	16	17	17	16	17	18	18	17	16	16	18	22				
-1	1	6	10	12	13	13	14	15	16	17	17	17	17	18	19	18	17	17	17	19	21				
3	6	9	11	13	14	14	15	16	16	15	15	16	18	19	19	19	18	18	19	19	19	21			
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6	6	10	14	15	16	16	17	18	17	14	13	14	17	20	20	20	20	20	19	19	19	19	21	22	23
11	10	12	15	17	17	17	17	18	17	15	15	15	18	21	21	21	21	21	21	21	20	19	20	22	24
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				22	22	22	24	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	23	24

Red cells inidcate Cut **Blue cells inidcate Fill**

Figure 15: Increases of finish grade over existing grade – based on Grid model

Response to (8) (g):

> (g) The SEIS does not identify the source(s) of where the fill material will come from, the type(s) of fill material that will be used or allowed, how much fill will be needed to reach the 50-foot height, whether the fill material will be tested before being allowed on the lower section, and what types of permits are needed to bring in fill material.

Response: The sources of the fill must be disclosed as a condition of the grading permit. It has been the common procedure at the Kapa'a site to require proof that no harmful soil is being brought the site before access to the site is given. As a general procedure, only inert fill will be used for grading at the site.

Response to (9) (a) through (d)

(9) The following are missing from the SEIS:
(a) Topographic map when landfill closed, when King family bought property and Hawaiian Earth Products was the tenant.
(b) Topographic map of existing lower site
(c) Topographic map of finished grade with building rendering on top of finished grade showing views from the levee and Kapa'a Quarry Road
(d) Without this information it is impossible to assess the visual and environmental impacts from the dramatic increase of the height of the lower section.

Response to (9) (a): Tor our knowledge, the referred topographic map is not currently available.

Response to (b): The topographic map of the existing grade which is presented in the Draft SEIS and **Appendix D of this Final SEIS** shows the topographic site situation at the time the 2017 SMP Minor Modification was filed. Figure 16 shows the existing grade as define above.

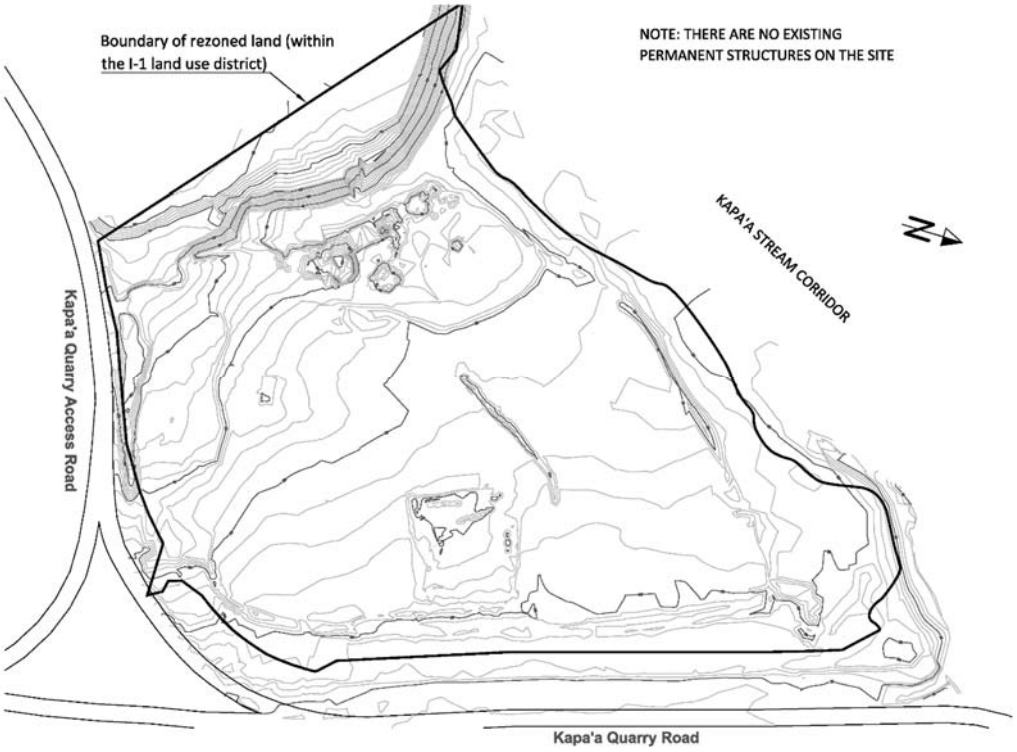

Figure 16: Existing topography of project site; status time of SMP Minor Modification application in 2017

Response to (9) (c):

Figure 17 shows the site map with the proposed finish grade. Several cross-sections of the Lower site are provided in the Draft SEIS and in **Appendix G of this Final SEIS.** (refer to Figure 18).

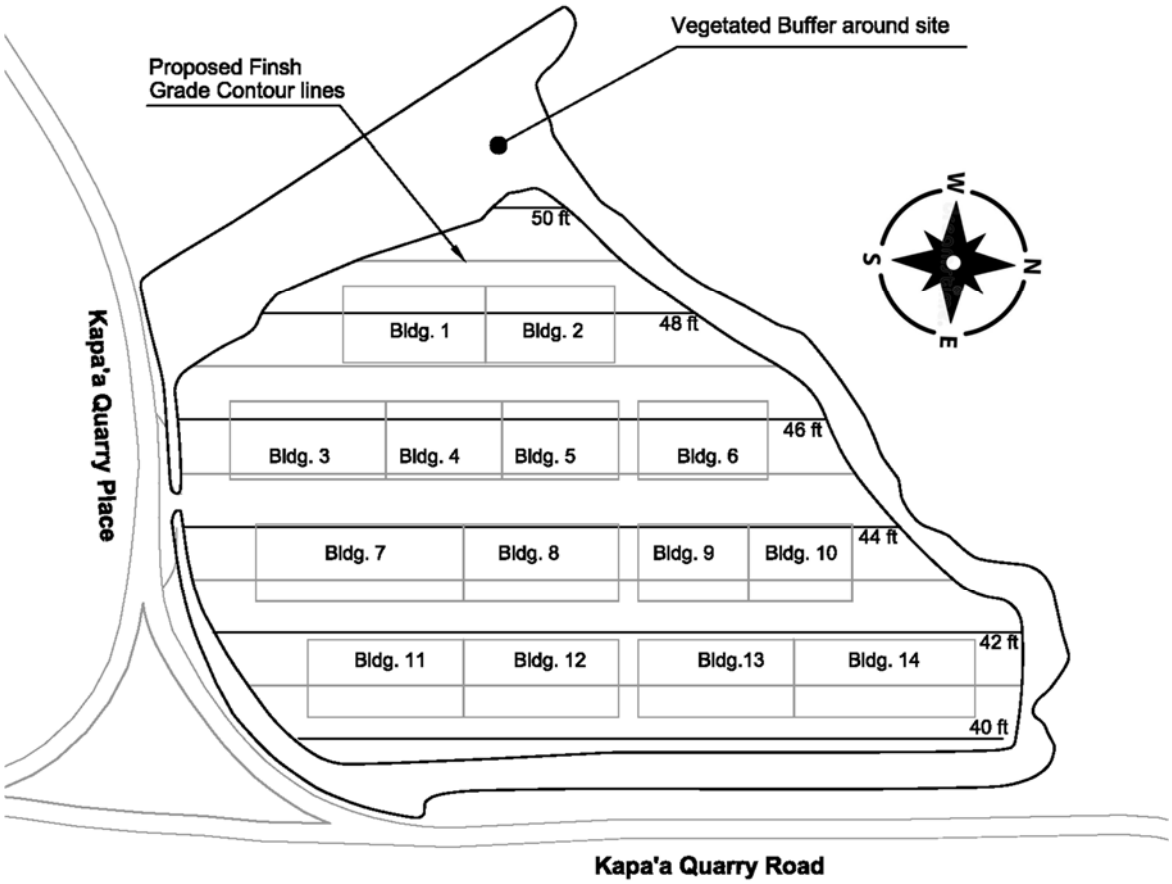

Figure 17: Proposed finish grade with buildings indicated

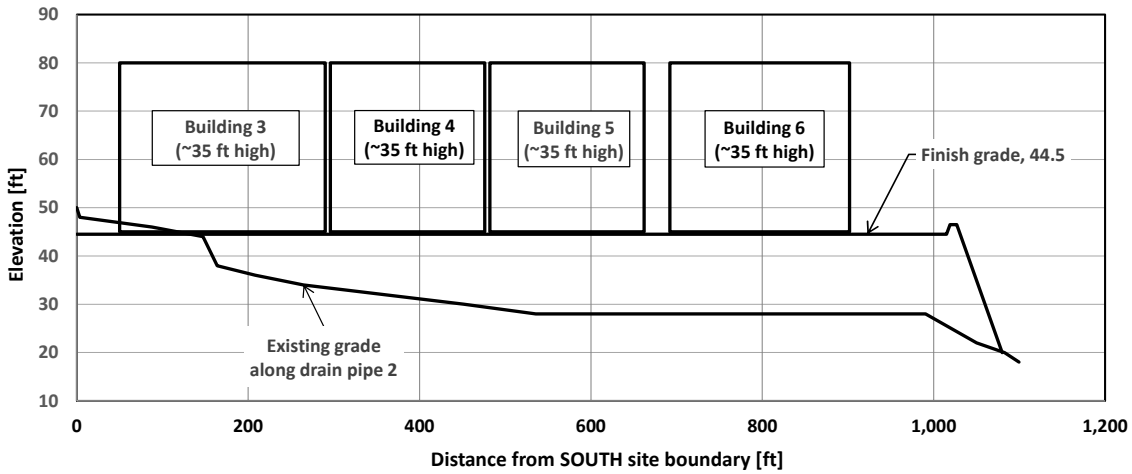

Figure 18: Cross section through Lower site along North-South axis at drainpipe 2

Response to (9) (d): It is our view that sufficient information has been shared in the various sections of the Draft SEIS and the **Appendices of this Final SEIS** to allow impacts to the environment and the community.

Responses to "Background Information"

BACKGROUND INFORMATION:

In our continuing effort to protect Kapa'a Stream, Maunawili Stream, Kahanaiki Stream, Kawainui Marsh, and Kailua Bay the KNB has provided comments and recommendations on all applications that the Board feels will impact the waters of Kailua. Since 2009 when the landowner John King applied to expand industrial uses in Kapa'a Valley, the KNB has responded to each application and environmental document with concerns about impacts of an expanded industrial park on the water quality of adjacent Kapa'a Stream, Kawainui Marsh, and Kailua Bay.

(1) In 2009 the KNB expressed concerns in the DEA, among other things, regarding:

(a) Effectiveness of the 18 septic wastewater systems' ability to accommodate 500-700 employees, at full buildout, while protecting Kapa`a Stream and Kawainui Marsh from harmful sewage overflow

(b) Impacts of storm water runoff from proposed 446 parking spaces on Kapa`a Stream and Kawainui Marsh

(c) Visual impacts from 5,000+ to 24,000+ square feet, 40 feet tall warehouses

(d) Effectiveness of the storm runoff collection and detention system especially the lower portion where the detention system was to collect 70,500 cubic feet of runoff

(e) Impacts on Kapa`a Stream and Kawainui from paving over 147,000 square feet for new warehouses and parking spaces

(f) Public safety concerns regarding the industrial parks push to have customers/employees ride bicycles on the substandard and dangerous Kapa`a Quarry Road to the industrial park

(g) Quantity and quality of storm water runoff into Kapa`a Stream

(h) Impacts from increased lighting on night views and migrating water birds

(i) Increased traffic on substandard Kapa`a Quarry Road

(j) Impacts of all stormwater systems on Kapa`a Stream and Kawainui Marsh

(k) Impacts from wastewater systems on Kapa`a Stream and Kawainui Marsh

Response to "Background Information" (1) (a)

In 2009, the technology proposed for onsite wastewater treatment was conventional septic systems. Under the updated site development approach an advanced onsite wastewater technology will be used. This technology significantly reduces the pollutant load in the wastewater, and therefore reduces environmental impact from effluent to the receiving water and to the community.

Response to "Background Information" (1) (b)

In 2009, the storm water treatment and management approach was not as efficient in reducing pollutant if the storm water.

Response to "Background Information" (1) (c)

In 2009, visual impact mitigation did plan to use more innovative measures to lower the visual impact. The measures that are proposed under the Draft SEIS and the Final SEIS have a wider range of measures to lower the visual impact.

Response to "Background Information" (1) (d)

In 2009, the storm water treatment and management approach was not as efficient in reducing pollutant if the storm water.

Response to "Background Information" (1) (e)

The impacts of storm water runoff on the Kapa'a Stream and the Kawainui Marsh are disclosed in the Draft SEIS and this Final SEIS.

Response to "Background Information" (1) (f)

We agree that there are traffic safety concerns on the Kapa'a Quarry Road and the Kapa' Quarry Place., especially regarding pedestrians and bicyclists. These roadways typically lack a shoulder which makes walking along the road and riding a bike unsafe. An appropriate remedy to mitigate related traffic safety issues would be the construction of a combined walkway / bikeway, as has been proposed for the improvement of the marsh.

The Applicant has expressed that he is willing to support the City & County of Honolulu to build a 1,500-foot path along the Easter site boundary, on his property. For area where the pathway could be built the City & County of Honolulu was granted a road and utility easement. **Appendix J of this Final SEIS** proposes a possible development which would use land of the present drainage ditch.

Response to "Background Information" (1) (g)

Quantity and quality of the runoff from the full build-out site has been addressed in the Draft SEIS and in **Appendix C of this Final SEIS**.

Response to "Background Information" (1) (h)

The impacts of increased lighting on night views and migrating birds have been addressed in the updated Proposed Lighting plan for the Lower site which is presented in **Appendix H of this Final SEIS**. DLNR has accepted the basic approaches of lowering light pollution at the site and the updated version presented in **Appendix H** uses the same basic approaches, while updating the site development design.

Response to "Background Information" (1) (i)

Traffic volume will be affected on adjacent roads. A Traffic Impact Analysis Report (TIAR) will be created after the Final SEIS is accepted and it is known what the final maximum size the development will be. The Applicant has cooperated with the Traffic Review Branch (TRB) of the DPP to develop a plan for frontage roadway improvements. Some of the agreed upon improvement measures have been implemented and the remaining improvements will be implemented in conjunction with the development of the Lower site.

Response to "Background Information" (1) (j)

Impacts of the storm water on the Kapa'a Stream and the Kawainui Marsh are discussed in the Draft SEIS and this Final SEIS.

Response to "Background Information" (1) (k)

Impacts of the wastewater discharge on the Kapa'a Stream and the Kawainui Marsh are discussed in the Draft SEIS and this Final SEIS. The proposed onsite wastewater treatment system has a higher efficacy of reducing pollutants from the wastewater effluent than earlier proposed treatment technologies.

Response to "Background Information" (2) (a) and (b)

> (2) In the 2011 EIS the KNB expressed the same concerns as in the DEA with the addition of the following:
> (a) That the drainage ditch at the foot of the lower portion of the industrial park property on the mauka side of Kapa`a Quarry Road be enlarged to be the receiving area for runoff from the industrial park, thus filtering storm water before it enters Kawainui Marsh.
> (b) Require on-site water monitoring wells

Response to (2) (a): In an earlier discussion of this **Appendix B,** it was pointed out the function of the drainage ditch ought to be reconsidered. In accordance with the DoH sponsored 2007 TMDL reporting the drainage ditch's function is to mainly receive water that is infiltrated through the land fill body of the Lower site. There are the following issues to consider:

Water that percolates through the land fill creates leachate which typically carries pollutants that are entrained by mass transfer and other conversion processes inside the landfill. The water that comes out of the landfill as leachate is potentially harmful. With the sealing of the project under the full build-out conditions and efforts to minimize water infiltrating into the landfill, it is expected that significantly less water will emerge from the land fill, improving the related impact scenario. With less water emerging, the capacity and function of the drainage ditch reconsideration as a significant drainage asset in the present state.

At the present time, the drainage ditch has changed considerably from the state in the early 2000s when it had a free surface. The drainage ditch is now overgrown with tall plants and cannot be distinguished from the vegetated area around the ditch. Due to the soil accumulation and the dense vegetation cover, discharge capacity is severely reduced as a storm water conduit.

If the drainage ditch were restored to the condition of the early 2000s, there could be impacts to the environment and the community. The fact that there is practically no shoulder and opportunity to stop in the section of the Kapa'a Quarry Road fronting the Lower site would create a traffic safety issue. Regarding environmental concerns, water birds could be attracted to the free surface and be subjected to higher risk of bird strikes from passing vehicles. The concern was raised by the UD Fish and Wildlife Service to avoid water bodies with free surfaces at the project site.

The proposed modifications of the drainage ditch and the projected benefits are presented in **Appendix J of this Final SEIS**.

Response to (2) (a): To reiterate earlier discussions, the installation of monitoring wells on the project site is not within the scope of the required measures. In addition, monitoring wells typically have a function that is not required at the project site.

Response to "Background Information" (3) (a) through (c)

> (3) A September 14, 2011 letter to DPP Director David Tanoue Sustainable Design & Consulting LLI stated "we fully agree with the need to "camouflage the new structures or hidden behind a screen of vegetation to the extent possible" and that the industrial park will install "a substantial capacity of photo-voltaic on the existing warehouses…." Since that 2011 letter there has not been any mention of camouflage or photovoltaic in any of the following environmental documents.
>
> (a) The FSEIS must contain explanations as to why these two commitments have not been met or discussed in other environmental documents.
>
> (b) The same letter stated that trees would be next to buildings "to provide shade (e.g. reduce non-roof heat island effect, reduce noise and evaporated captured stormwater…"
>
> (c) The FSEIS must explain why trees that were touted as being beneficial have been eliminated from the interior of the industrial park and will only be on the perimeter.

Response to (2) (a): These two issues have been met and are also discussed in the planning document and in this Final SEIS.

Appendix G of this Final SEIS describes the visual impact mitigation measures that have been reviewed for this project. The issue of camouflaging facilities is a still evolving trend in the development of sites and utility installations. **Appendix G** discusses measures to camouflage facilities by applying texture and color. **Appendix G** also addresses also how facilities are affecting the visual experience of the observer. The **Appendix G** suggests preferred visual impact mitigation strategies for different viewpoints, such as short- and long distance. In addition to camouflaging facilities with color schemes applied to the façades the visual impact will be mitigated with trees on the site perimeter.

Since 2011, the Applicant has been adding photovoltaic capacity to the warehouse development. At the present, the installed electric capacity at the KLIP has an equivalent of providing electric energy to about 140 households (average applied). The Applicant has plans to install as much PV as possible to be able to offset the energy demand from the warehouse development. The challenge is not whether the Applicant wants to add PV, but if the Applicant will be allowed to install this much PV and add the output to the island wide grid.

Response to (2) (b) and (c): Trees will be added in the interior of the development. There is a requirement to plant trees for shade on traffic lots (refer to the **Appendix F in this Final SEIS**). Trees will also be planted inside the project site for aesthetic reasons and to assist in visual impact mitigation (refer to the **Appendix G in this Final SEIS**). In addition, trees have, as correctly stated, a sound impact mitigation function. The function of trees to provide significant storm water treatment functions is not considered for the project site, since significant infiltration must be avoided. Therefore, the typical

design of funneling storm water runoff from larger traffic areas to the tree wells is not applied for the project. Rather, the trees only receive enough irrigation for growth. The irrigation water will be provided by harvested rainwater.

Response to "Background Information" (4)

> (4) In 2013 the KNB opposed the rezoning of three parcels in Kapa`a Industrial Park from P-2 to I-I for basically the same reasons stated in the board's responses to previous environmental documents. There was strong community opposition to the rezoning, but community voices were ignored.

While there was opposition in the community to the development of the Kapa'a Light Industrial Park (KLIP), there was also significant support which was voiced during the permitting processes. The following are a few of the benefits of the KLIP that were mentioned by the community during the permitting process:

- There are benefits to the environment and community of having light industrial space available on the windward site.
- There is a high demand for light industrial space on the windward side. Many businesses seek places for the businesses which are closer to their windward homes.
- There is limited space on the windward side that is zoned for light industrial uses, since existing spaces are converted to higher valued residential and commercial uses.
- Consumers and employees that are served or employed at the KLIP can avoid long trips and commutes to leeward locations. The avoidance of longer trips helps to reduce environmental impact.
- The Koolau Poko Sustainable Community Plan identifies the land of the KLIP as one of a few windward locations where space serving light industrial uses can be built. One of the aspects in sustainability is developing in such a way to avoid long trips.

All the benefits have, of course, to assume of sustainable development that aligns to the Triple Bottom Line (TBL). The TBL is the basis of corporate sustainability solutions and balances social, environmental, and financial needs.

Response to "Background Information" (5): We acknowledge receipt of your comments.

Response to "Background Information" (6):

> (6) It is our understanding that DPP approved all the Kapa`a Industrial Park environmental documents in part because of the comprehensive storm water system proposed for the lower portion of the industrial park. Now for some reason the lower portion superior storm water drainage system does not fit into the applicant's development plans and has been modified. In addition, the number of buildings and amount of impervious surfaces have expanded, and the height of the lower portion has been raised from 25 to 30 feet to 40 to 50 feet.

Response: Since the 2011 FEIS was accepted, core-required processes and technologies used in the storm water treatment and management system at the project site have changed. The changes have, however, resulted in a higher efficacy of the storm water systems to remove pollutant and to perform function of flood control.

The storm water systems which have been installed since 2011 and which are planned for installation must comply with State and County regulation which are more stringent than in 2011. The assertion that the Applicant chooses not to implement the 2011-FEIS accepted storm water systems because they do not fit into his development plans do not portray the Applicant's intention and actions. On the one side, the storm water impact mitigation must be at least as good as is required by applicable regulations. On the other side, the Applicant wants to implement an effective storm water system in the Lower site which surpasses the basic requirements, since the Lower site is within the SMA area.

The conclusion of the comment that the building footprint proposed in the SEIS will be increased relative to the 2011-FEIS needs to consider that proposed building footprint under the SEIS is basically the same as under the 2011 FEIS, with change of less than 1%.

The mentioning of increasing the grade "from 20 to 30 feet to 40 to 50 feet" is only partially applicable. The existing site has elevations in a range from 20 to 60 feet. The finish grade will produce a slightly Easterly-sloped flat area with elevation of 40 to 50 feet. **Appendix D of this Final SEIS** delineates the needs of the increased grade elevations to create hydraulic gravitational flow energy for the comprehensive storm water treatment and management system.

RESPONSES TO COMMENTS RECEIVED FROM HAWAII AUDUBON SOCIETY

The following letter was received from Hawaii Audubon Society (3 pages)

For the Protection of Hawaii's Native Wildlife
HAWAII AUDUBON SOCIETY
850 Richards Street, Suite 505, Honolulu, HI 96813-4709
Phone/Fax: (808) 528-1432; hiaudsoc@gmail.com
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January 7, 2021

Zack Stoddard
Department of Planning and Permitting
Land Use Approval Branch
Zachary.stoddard@honolulu.gov

Manfred Zapka, Consultant
Sustainable Design & Consulting, LLC
sustainableDC@gmail.com

Senator Chris Lee
senlee@capitol.hawaii.gov

RE: Development of new portions of the Kapa`a Light Industrial Park Draft Supplemental Environmental Impact Statement (DSEIS)

The Hawaii Audubon Society (HAS) hereby submit the following comments pertaining to the development of new portions of the Kapa`a Light Industrial Park DSEIS. These comments are consistent with the HAS mission statement and our previous comments on the Kawainui-Hamakua Complex Master Plan EIS.

HAS has reviewed the DSEIS and finds it that it does not meet the requirements of Hawaii Revised Statutes (HRS) Chapter 343 or Hawaii Administrative Rules (HAR) Title 11 Section 200. The DSEIS does not fully disclose or assess all the primary, secondary and cumulative impacts of the toxic pollution that is highly likely to flow and seep down from the proposed industrial development project into the adjacent Kapa`a Class 2 stream and downstream Kawainui Marsh Class 1 wetlands. This Project is highly likely to cause the already substantial degradation of the environmental quality of these stream and wetlands to increase and negatively impact the endangered waterbirds that inhabit these sensitive environments. It is also likely to affect human health since native Hawaiian groups cultivate traditional food crops on the margins of the downstream wetlands.

Kapa`a Stream, which flows from Kapa`a Valley into Kawainui Marsh, is referred to as an intermittent stream. Kapa`a Stream is bordered by auto repair shops and other industrial uses and a rock quarry for which Total Maximum Daily Load (TMDL) standards have been calculated

because of the many contaminates that already enter the stream. Water from Kapa`a Stream flow into Kawainui Marsh, particularly during heavy rains, and the DEIS should include a detailed plan for cleaning up the water flowing from Kapa`a Stream into Kawainui Marsh. One action item should be the requirement that the ditches on either side of Kapa`a Quarry Road below the industrial park should be cleared of invasive vegetation so they can function as designed to filter water from the abandoned dump under the industrial park and the polluted Kapa`a Stream before it enters the Class 1 waters of Kawainui Marsh, designated a Wetland of International Importance under the Ramsar Convention. It is the objective of Class 1 waters that these waters remain in their natural state as nearly as possible with an absolute minimum of pollution from any human caused source. Waste discharged into these waters is prohibited and any conduct that results in a demonstrable increase in the levels of point or nonpoint source contamination in Class 1 waters is prohibited. (HAR Chapter 11-54)

Kapa`a Stream is supposed to be a Class 2 inland stream under State Department of Health Water Quality Standards, whose objective as applied to Kapa`a Stream is "to protect its uses for recreational purposes, support and propagation of fish and other aquatic life..." Yet Kapa`a Stream is on the State Department of Health List of Impaired Waters prepared under the Clean Water Act §303(d) because of elevated concentrations of turbidity, total suspended solids, nutrients, and metals in the stream. Despite this the City's Department of Planning and Permitting and the City Council approved the zone changes, FEIS and SMAP for the Kapa`a Industrial Park.

In the DSEIS the approved wastewater system has been changed to a system that does not make water reusable for irrigation or other purposes and is currently a pilot project at the industrial park. The new system will use a membrane bioreacor (MBR) technology, which includes infiltration fields at the site perimeter which boarders Kapa`a Stream. Figure 6.2.3.13 in the DSEIS shows that all waste and storm water from the lower landfill section three stand-alone containerized waste water membrane bioreator treatment plants and three stormwater drain outlets are directed to Kapa`a Stream, which runs into Kawainui Marsh and eventually into Kailua Bay. This will add cumulatively to the impact of the stormwater currently flowing from the existing Kapa`a Industrial Park and the nearby municipal waste transfer station.

In the DSEIS all the green space and landscaped barriers around the warehouses have been replaced with 27 acres of impervious surface thus eliminating the ability to capture stormwater runoff and reuse the captured water for other purposes. Because the DSEIS lacks specifics on what Best Management Practices (BMPs) will be used after construction and for the life of the industrial park it is impossible to tell whether they will be adequate to prevent additional polluted stormwater from going into Kapa`a Stream.

The SEIS is silent on the project's impacts to seabirds and migratory birds from lights in parking areas and on buildings that are approximately 117 feet in the sky. Kapa`a Stream and Kawainui Marsh provide habitat for four endangered water birds and a stopping off place for migratory birds so the FSEIS must contain meaningful and attainable mitigation measures to help ensure that endangered bird species are not harmed or killed by this project.

The SDEIS is also silent on the types of chemicals that will be used to achieve low phosphorus concentrations in the effluent and to produce bisolids that are acceptable for disposal. It is important to understand that there is no such thing as a safe landfill. No matter how many barriers, liners and pipes are installed to mitigate the risk, landfills will always leak toxic chemicals into the soil and water. To prevent continuous degradation and nutrient loading in Kapa`a Stream and ensure that water leaving the lower landfill section is as clean as possible as it migrates from Kapa`a Stream into Kawainui Marsh and eventually into Kailua Bay the City should require the industrial park to hook up to the City municipal sewer system before approving any construction on the lower landfill site.

Thank you for the opportunity to provide comments.

Sincerely,

Linda M. B. Paul, HAS President

CC:
Glenn Haae
State of Hawaii Department of Health
Solid Waste Section
Solid and Hazardous Waste Branch
glenn.haae@doh.hawaii.gov

Senator Jarrett Keohokalole
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Council Member Esther Kiaaina
ekiaaina@gmail.com

3

Responses to the following paragraph:

HAS reviewed the DSEIS and finds it that it does not meet the requirements of Hawaii Revised Statutes (HRS) Chapter 343 or Hawaii Administrative Rules (HAR) Title 11 Section 200. The DSEIS does not fully disclose or assess all the primary, secondary and cumulative impacts of the toxic pollution that is highly likely to flow and seep down from the proposed industrial development project into the adjacent Kapa`a Class 2 stream and downstream Kawainui Marsh Class 1 wetlands. This Project is highly likely to cause the already substantial degradation of the environmental quality of these stream and wetlands to increase and negatively impact the endangered waterbirds that inhabit these sensitive environments. It is also likely to affect human health since native Hawaiian groups cultivate traditional food crops on the margins of the downstream wetlands.

Response: The Kapa'a Light Industrial Park (KLIP) has a comprehensive plan to avoid the discharge of toxic pollution from the active light industrial uses. This plan includes source control and the installation and operation of storm water as well as onsite wastewater treatment facilities. As the KLIP grows toward full build-out conditions storm water and wastewater treatment facility components will be added. The storm water as well as the wastewater treatment facilities at the project site are designed and implemented to offer flexibility as more elements are added.

Most of the storm water treatment system elements are designed to operate independently but some system elements are interlinked. In case they are interlinked, the treatment system element that is added later must not surpass the treatment capacity of the element that it connects to.

The landfill at the project site is a closed landfill whose operations started some 60 to 70 years ago. This landfill was created without a subsurface liner, which has become a required design element of modern landfills. In modern landfills, leachate collection and treatment systems are installed to remove harmful pollutants. This is not the case for the landfill at the project site and leachate that is generated from precipitation and infiltrates has no subterrain barrier, so polluted leachate can migrate off site, either along surface or subsurface pathways. The remedy to mitigate the leachate problem at the site is to install an impervious cover, in the form of impervious pavement and building roofs.

The preferred storm water design standard is to infiltrate as much runoff as possible. This has several benefits, including lower capacity demand on municipal system, better treatment, recharge of aquifers and flood control. For the reasons outlined above, infiltration of significant volumes of storm water cannot be done at the project site. This results in using the treatment method of collection the storm water from the impervious area and subjecting it to a comprehensive treatment train before it is discharged to the receiving water. By definition, a storm water treatment train combines multiple treatment processes that ensures that all pollutants that can affect the receiving water are considered.

With the proposed storm water system in place at full build-out, the water quality impacts from the site will be reduced relative to the present time. Therefore, the water quality in the Kapa'a Stream and the downstream Kawainui marsh will not be negatively affect relative to the existing conditions.

The onsite wastewater system is designed to reduce the impacts on the environment as well as the community. The KLIP is not connected to the municipal sewer and there are no plans that the city will connect the site. Connecting to the municipal is only possible by installing a sewer pump which requires significant energy and therefore has environmental impact. In addition, connecting to a municipal sewer might require increasing the conveyance capacity of sewers lines in Kailua, which would receive the wastewater from the KLIP.

Onsite wastewater treatment processes are not necessarily inferior when compared with a centralized wastewater plant. The conveyance of wastewater from the source to the central treatment plant requires expensive sewer pipe infrastructure and pumping energy. The applicable EPA effluent standard of a secondary municipal treatment plant, also referred to as publicly owned treatment works (POTW), allows a 7-day average of 45 mg/l for both the biological oxygen demand (BOD_5) and total suspended solids (TSS). This means that these plants scan discharge treated effluent of these concentrations to the receiving water (in Hawaii almost always the ocean). The selected and tested technology for the onsite wastewater treatment system has a range of 5 to 10 mg/l for both the BOD5 and TSS. In addition to lowering the pollutants in the effluent, the treated effluent at the site can be used directly as recycled water, for example to provide irrigation.

The treated storm water and wastewater from the systems at full build-out will therefore provide an improvement from the conditions before the existing conditions at the project site.

Responses to the following paragraph:

Kapa`a Stream, which flows from Kapa`a Valley into Kawainui Marsh, is referred to as an intermittent stream. Kapa`a Stream is bordered by auto repair shops and other industrial uses and a rock quarry for which Total Maximum Daily Load (TMDL) standards have been calculated because of the many contaminates that already enter the stream. Water from Kapa`a Stream flow into Kawainui Marsh, particularly during heavy rains, and the DEIS should include a detailed plan for cleaning up the water flowing from Kapa`a Stream into Kawainui Marsh. One action item should be the requirement that the ditches on either side of Kapa`a Quarry Road below the industrial park should be cleared of invasive vegetation so they can function as designed to filter water from the abandoned dump under the industrial park and the polluted Kapa`a Stream before it enters the Class 1 waters of Kawainui Marsh, designated a Wetland of International Importance under the Ramsar Convention. It is the objective of Class 1 waters that these waters remain in their natural state as nearly as possible with an absolute minimum of pollution from any human caused source. Waste discharged into these waters is prohibited and any conduct that results in a demonstrable increase in the levels of point or nonpoint source contamination in Class 1 waters is prohibited. (HAR Chapter 11-54)

The responses to the previous paragraph already outlined the comprehensive full build-out storm water and wastewater treatment systems at the KLIP.

The Applicant has the responsibility to implement the system that reduces impacts originating from his site.

The conditions of and the proposed modification of the drainage ditch along the Kapa'a Quarry Road is discussed in **Appendix J of this Final SEIS**. The proposed modifications suggest excavating the drainage ditch and clearing it from the dense vegetation that has filled the ditch. The proposed modification further suggests the installation of a shallow vegetated swale with a bed of gravel underneath. This gravel bed would infiltrate water that enters through the vegetated swale into the surrounding soil. The area around the filled drainage ditch could be developed with new trees and a pathway for pedestrians and bikers. This pathway could be part of the planned marsh perimeter path. The Applicant has indicated that he could donate land for the approximate 1,500 feet pathway that would be built on his property.

Establishing a free surface in the drainage ditch, such as it was back in 2003, would not be a preferred scenario since it could cause safety concerns and negative environmental impact. Regarding safety of birds, the US Fish and Wildlife Service stated the requirement that no basins with free surfaces are installed at the project site. These concerns were based on the risks of increased predators and traffic kills for water birds which are attracted to the free surface. Imagining risk to water birds which are attracted to larger and constantly present free water surface in the drainage ditch would have. Regarding storm water treatment, the proposed vegetative swale, and the below infiltration bed should have a better treatment effectiveness than the restored drainage ditch.

It must be pointed out that the Applicant has no jurisdiction over the drainage ditch since a road and utility easement of the roadway and drainage ditch was awarded for the property to the City and County of Honolulu. Therefore, the final decision what happens to the drainage ditch rests with the City and County of Honolulu.

Responses to the following paragraph:

In the DSEIS the approved wastewater system has been changed to a system that does not make water reusable for irrigation or other purposes and is currently a pilot project at the industrial park. The new system will use a membrane bioreactor (MBR) technology, which includes infiltration fields at the site perimeter which boarders Kapa`a Stream. Figure 6.2.3.13 in the DSEIS shows that all waste and storm water from the lower landfill section three standalone containerized wastewater membrane bioreactor treatment plants and three stormwater drain outlets are directed to Kapa`a Stream, which runs into Kawainui Marsh and eventually into Kailua Bay. This will add cumulatively to the impact of the stormwater currently flowing from the existing Kapa`a Light Industrial Park and the nearby municipal waste transfer station.

Response: The following statements are correct:

The onsite wastewater system for the older buildings at the KLIP use conventional septic systems. While septic systems are the most frequently used onsite wastewater systems and perform well given their specific treatment process, advanced treatment systems create effluent with less residual pollution.

At the present time two advanced wastewater treatment systems are installed under a pilot project accepted by the Department of Health, Wastewater Branch. The pilot project tests the performance of the infiltration field that treats the treated effluent.

The treatment technology is the Membrane Bioreactor (MBR) technology which uses activated sludge in an aerobic process to remove organic pollutants. The effluent is then discharged through a membrane which removes most of the suspended solids, including fine particles which typically are not removed by clarifiers down stream of other aerobic treatment systems.

As the vendor of the MBR technology for project site has stated, there are several hundred MBR installations on the US mainland and abroad. The specific MBR technology for the project site is certified under the National Sanitary Foundation (NSF) 350 standard. This NSF 350 certifies wastewater systems that have an effluent with very low residual pollutant concentration. The NSF 350 standard describes that effluent of these systems can be used as recycled water for "unlimited outdoor use", provided that the effluent is disinfected. In the pilot project the effluent of the two MBR units is not disinfected and therefore must be infiltrated so that there is no exposure to humans. A possible use as un-disinfected recycled water would be through drip irrigation, but this is not within the scope of the pilot project.

Figure 6.2.3.13 of the Draft SEIS depicts the discharge locations of the treated storm water. The wastewater is discharged into an infiltration filed that is located between the Upper and Lower site. The location of the infiltration was selected since it is better suited for infiltration of the wastewater effluent than a location in the core areas of the KLIP. The soil inside the core areas has a very low permeability while the soil at the location of the infiltration field has much better percolation rates.

Responses to the following paragraph:

In the DSEIS all the green space and landscaped barriers around the warehouses have been replaced with 27 acres of impervious surface thus eliminating the ability to capture stormwater runoff and reuse the captured water for other purposes. Because the DSEIS lacks specifics on what Best Management Practices (BMPs) will be used after construction and for the life of the industrial park it is impossible to tell whether they will be adequate to prevent additional polluted stormwater from going into Kapa`a Stream.

Response: The development plan of the warehouse development will retain vegetated land around the site perimeter. **Appendix I of this Final SEIS** describes the design concepts of the vegetated buffer zone around the Lower portion of the site. These design concepts were approved by the Hawaii Department of Land and Natural Resources (DLNR). The design concepts include the construction of site perimeter zones made of earth berms, which will surround the entire Lower site. The perimeter berms will be

planted with trees shrubs and other vegetation. The DLNR has provided recommendations of using native and adapted plants species for the vegetated buffer zones at all four site perimeter berms.

The Applicant has identified BMPs for the construction and post-construction period; both structural and non-structural BMPs will be used. The proposed BMPs were disclosed to the DPP in form of various Strom Water Strategic Plans and to the DoH as Storm Water Pollution Prevention Plans for the NPDES permits. The following is a list of BMPs which will be used in the post-construction storm water design and the pollution prevention program for construction. The selected BMPS include:

Illicit Discharge Detection and Elimination Program

- Trash and Illegal Dumping
- Used Oil Recycling Program
- Illegal Dumping Control
- Trash and Debris Management
- Decentralized Wastewater
- Preventing Septic System Failure

Construction

Project Oversight

- Construction Phase Plan Review
- Contractor Training and Certification
- Following Local Ordinances for Construction Site Runoff Control
- Construction Inspection Program

Construction Site Planning and Management

- Construction Sequencing
- Construction Site Operator BMP Inspection and Maintenance
- Land Grading
- Preserving Natural Vegetation

Erosion Control

- Chemical Stabilization
- Compost Blankets
- Dust Control
- Geotextiles
- Gradient Terraces
- Riprap
- Seeding
- Sodding
- Wind Fences and Sand Fences
- Check Dams
- Temporary Diversion Dikes

Sediment Control

- Filter Socks
- Construction Entrances
- Fiber Rolls
- Filter Berms
- Sediment Basins and Rock Dams
- Sediment Filters and Sediment Chambers
- Sediment Traps
- Silt Fences
- Storm Drain Inlet Protection
- Vegetated Buffers

Good Housekeeping/Materials Management

- Concrete Washout
- General Construction Site Waste Management
- Spill Prevention and Control Plan
- Vehicle Maintenance and Washing Areas at Construction Sites

Post-Construction

General

- Site development Program Elements
- BMP Inspection and Maintenance

BMPs for Site Plans

- Conservation Easements
- Eliminating Curbs and Gutters
- Green Parking
- Vegetative buffer strips
- Infrastructure Planning
- Low Impact Development
- (LID) and Other Green Design Strategies

Open Space Design

- Protection of Natural Features
- Riparian/Forested Buffer
- Street Design

  Urban Forestry Infiltration (only on the site perimeter berms) Filtration

- Bioretention (Rain Gardens)
- Catch Basin Inserts
- Sand and Organic Filters

- Vegetated Filter Strip
- Manufactured Treatment device (MTD)

Detention

- Dry Detention Vaults
- In-Line Storage
- On-Lot Treatment

Responses to the following paragraph:

> The SEIS is silent on the project's impacts to seabirds and migratory birds from lights in parking areas and on buildings that are approximately 117 feet in the sky. Kapa`a Stream and Kawainui Marsh provide habitat for four endangered water birds and a stopping off place for migratory birds so the FSEIS must contain meaningful and attainable mitigation measures to help ensure that endangered bird species are not harmed or killed by this project.

Response: The updated version of a 2016-submitted and accepted "Proposed Concept Plan for Exterior Lighting" is presented in **Appendix H of this Final SEIS**. **Appendix H** describes the measures that will be used to mitigate light pollution and the associated effects on night sky and on wildlife, especially migrating birds.

The new vegetative buffer zones at the site perimeter will have important visual impact mitigation functions. Figures 1 and 2 describe the light pollution reduction approaches used in two typical sections of the full build-out perimeter areas. The figures indicate the extent of light trespassing from the traffic and parking areas to the surrounding vegetated land.

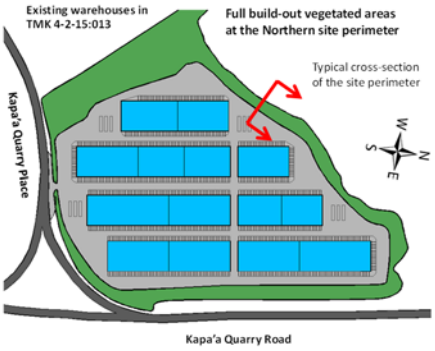
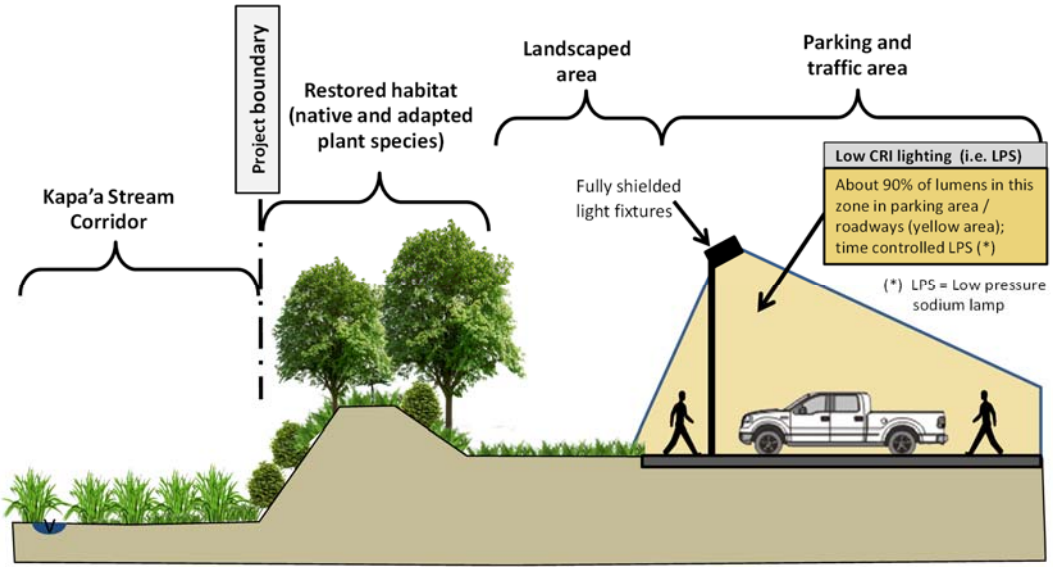


Figure 1: Full build-out vegetated area at the **Northern** site perimeter

<<< Location of the representative cross section

Below: Concept of external lighting at the **Northern** site perimeter at full build-out - Typical cross-section – Note: Concept illustration not to scale (source: Appendix H, Figure 5.5)



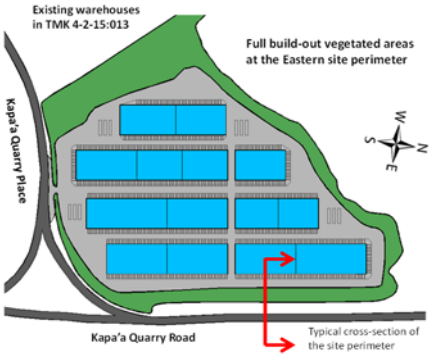
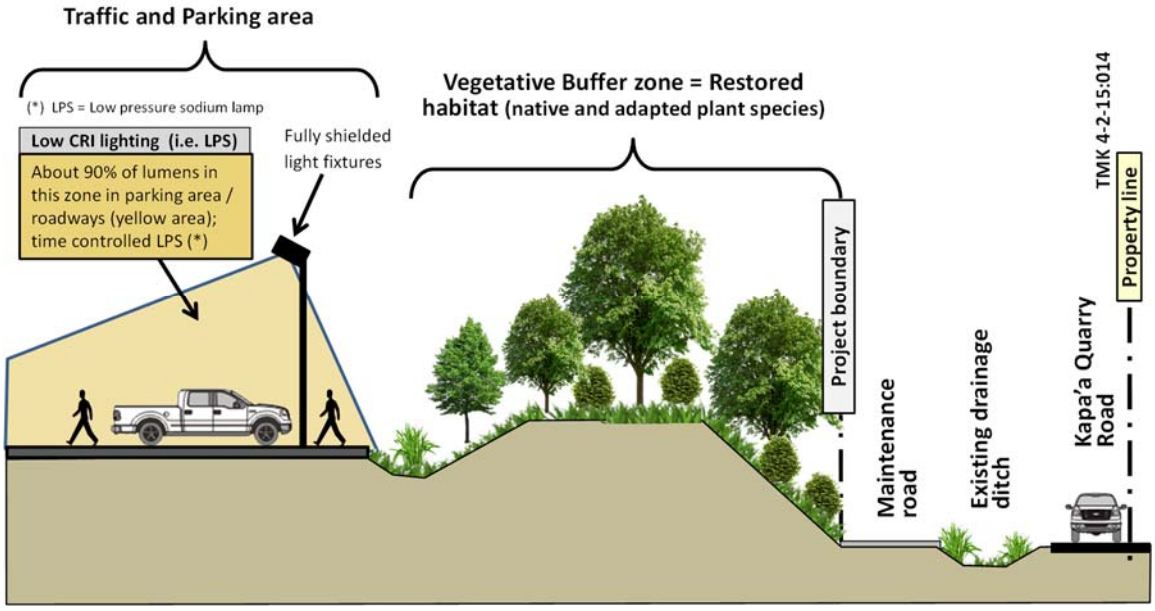


Figure 2: Full build-out vegetated area at the E**astern** site perimeter (source

<<< Location of the representative cross section

Below: Concept of external lighting at the E**astern** site perimeter at full build-out - Typical cross-section – Note: Concept illustration not to scale (source: Appendix H, Figure 5.7)



The land around the project site falls into two different outdoor lighting zones designations. Figure 3 illustrates the two lighting zones surrounding the project site. The project site and adjacent areas are characterized as urban areas with light and intensive industrial use with limited nighttime use.

- Land with Lighting Zone LZ-3: The land to the West and adjacent to the project site is a densely developed industrial park. The land is zoned Intensive Industrial (I-2). There is not wildlife habitat on in parcel TMK 4-2-15:013.
- Land with Lighting Zone LZ-2: The land to the North, West and South and adjacent to the project site is vegetated land with habitat of wildlife.

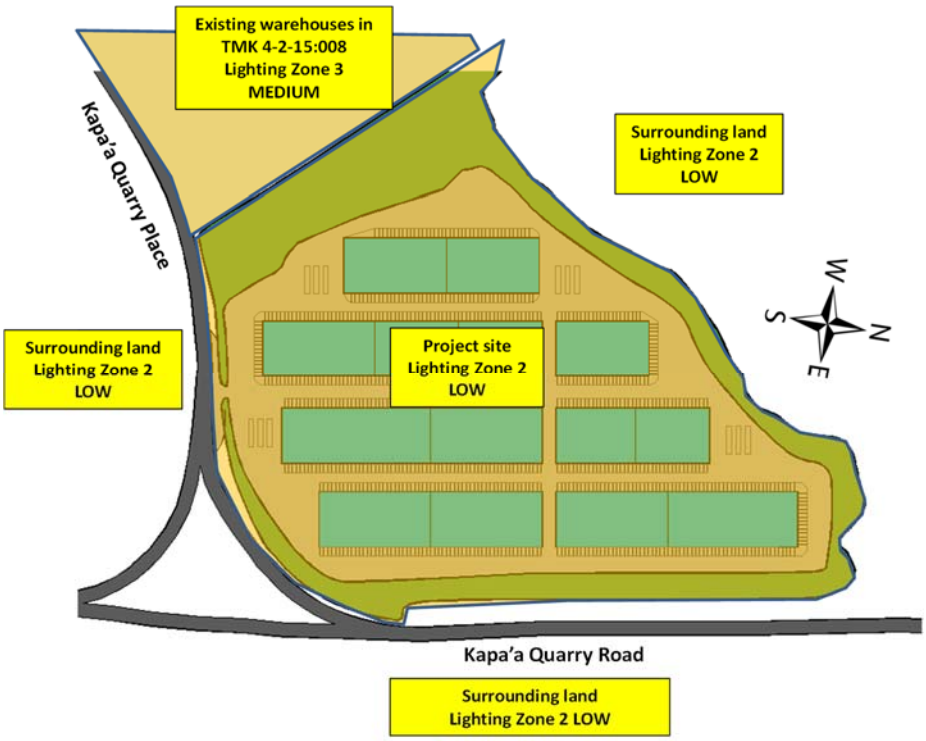


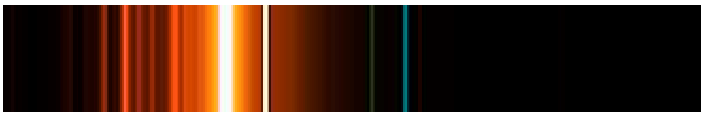
Figure 3: Lighting zones of project site and adjacent area (source: Appendix H, Figure 5.5)

The selection of the right light bulb, and therefore of the light color, for the application has a significance on the effectiveness of mitigating negative effect of excessive light on wildlife, and on migrating birds. Artificial night lighting harms species directly by triggering unnatural periods of attraction or repulsion that leads to disruptions in reproductive cycles, by fixation, by disorientation, or by interfering with feeding and sustenance. Light pollution has been shown to disorient migratory birds and hatchling turtles, disrupt mating and reproductive behavior in fireflies and frogs, and interfere with communication in animal species.

There is evidence that the use of high- and low-pressure sodium light in ecologically sensitive areas such as wetlands, woods, and coastal areas has <u>less impact on habitat and life cycle behavior</u> than use of other types of light sources. The relatively monochromatic wavelength emitted by the yellow tinted sodium vapor lights attracts fewer insects and can be more easily filtered to minimize negative effects.

Yellow lights such as high-pressure sodium (HPS) or low-pressure sodium (LPS) lamps should be used in environmentally sensitive areas.

Low-pressure sodium lamps are used in American cities, particularly those near active astronomical research facilities. The county of Hawaii (Big Island) has reported good results from using low pressure sodium lamps for general roadway and parking lot lighting. Advantages of the low-pressure sodium lamps are the excellent high-efficacy and good maintenance of luminous output and long lifetime. Because of the poor color rendering, low-pressure sodium lamps can only be used in so-called "Class 2" lighting that is lighting situations in which the perception of color is not necessary for the type of activity carried out under the lighting conditions.

	**Low-Pressure Sodium (LPS);** Spectrum 700 -- 350 nm

High-pressure sodium lamps are currently the most widely used high-intensity discharge (HID) lamps for roadway and parking lot lighting, though in some areas metal halide lighting is becoming more popular. Advantages include a long lifetime, a wide variety of moderate to high luminous output lamps (2000 - 120,000 lumens mean output), high efficiency and good maintenance of luminous output. Disadvantages include poorer color rendition.

	High-Pressure Sodium (HPS); Spectrum 700 -- 350 nm

For internal traffic and parking area lighting of the project, the **low-pressure sodium lamp is preferred** over high-pressure sodium lamps since the type of light color spectrum produced by the low-pressure sodium lamps is less harmful to wildlife, especially migrating birds, than the color spectrum produced by high-pressure sodium lamps.

For illumination of loading docks and entrances where a good color rendering is required, **LED lighting** will be used in the project. Figure 4 shows a typical installation approach, where the LPS traffic area provides loading zone illumination. The LED light has a higher color rendering index (CRI) than the LPS lights which are mainly used inside the site. The higher CRI LED-illumination supports loading operation when it is of importance to distinguish colors. Figure 4 illustrates that shielding of the LPS lights avoids significant light trespassing into the vegetative buffer zone. The combination of effective light shielding, and the light obstruction function of the vegetative buffer zone, avoids direct light trespassing into adjacent land.

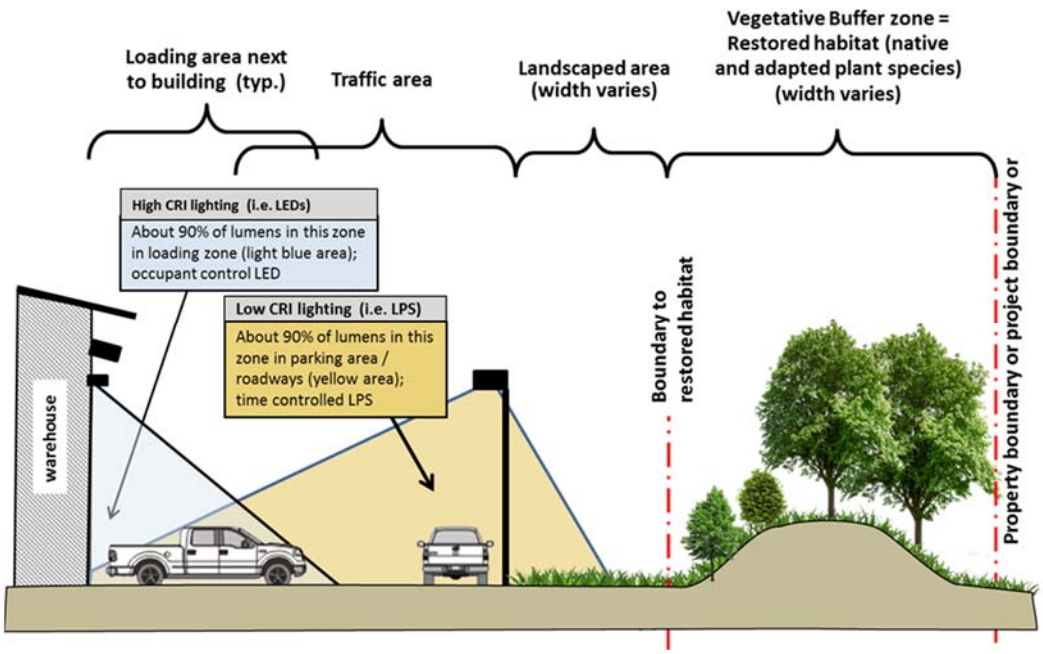


Figure 4: Typical cross-section for lighting installation on traffic areas with loading zone illumination (source: Appendix H, Figure 5.5)

As is described in **Appendix H of this Final SEIS**, the following design guidelines will be the basis for the detail design of the lighting system. The detail design will include the exact locations, the light power density of the two types of external lighting fixtures and the type of lighting products.

- The project site and adjacent land, vegetated land, and the highly developed land, is categorized in accordance with light zones as LZ2 and LZ3.
- The amount of light trespassing into the adjacent land follows the recommendation of the LEED credit for light pollution reduction. The selection of the shielded (e.g., full cut-off) external light fixtures will ensure light trespassing control in accordance with the LEED guidelines.
- The light power densities for external lighting follow the energy code and the ASHARE 90.1 standards.
- Low-pressure sodium (LPS) lamps are selected for roadways and parking lot illumination within the project site since their monochromatic spectrum is reported as causing the least negative impacts on wildlife. The low color rendering capability of low-pressure sodium lamps is acceptable for the intended function and their environmental benefits dominate the selection. The basic design objective for project site immunization is supplying the lowest acceptable light level and avoid significant light trespass to adjacent land.
- LED external fixtures are limited to areas where color rendering is of concern, such as for loading docks and for building entrances. The proposed installation method for LED fixtures at the loading docks on the Eastern side of buildings is illustrated in Figure 4.

Responses to the following paragraph:

The SDEIS is also silent on the types of chemicals that will be used to achieve low. phosphorus concentrations in the effluent and to produce biosolids that are acceptable for disposal. It is important to understand that there is no such thing as a safe landfill. No matter how many barriers, liners and pipes are installed to mitigate the risk, landfills will always leak toxic chemicals into the soil and water. To prevent continuous degradation and nutrient loading in Kapa`a Stream and ensure that water leaving the lower landfill section is as clean as possible as it migrates from Kapa`a Stream into Kawainui Marsh and eventually into Kailua Bay the City should require the industrial park to hook up to the City municipal sewer system before approving any construction on the lower landfill site.

The following responses are given:

No chemicals are used to remove phosphorus, both in the storm water and the wastewater treatment processes.

In the MBR wastewater system used at the site polymers or chloride compounds are not used to increase phosphorus removal rates.

The MBT unit, Bio Barrier membrane, used at the site has a nominal ultrafiltration pore size of 0.03 micron. Generally, this means physical separation of bacteria, many types of virus, and other high molecular weight compounds. Therefore, some reduction of emerging pathogens and pollutants of concern is expected, but we cannot quantify specifically a typical reduction performance. There should certainly be less impact on stream quality as compared to alternative technologies.

The extent of phosphorus removal is expected to be a 1 mg/L reduction below the influent concentration, as this is typically what the activated sludge process achieves through the bacteria metabolic uptake. Additional removal usually depends on a chemical addition for precipitation of phosphorus with physical removal performed by the membranes filtering out the resulting solids.

At landfills which have engineered liners the leakage of leachate into the ground can be significantly reduced.

The MTDs used in the Lower site have reported storm water treatment effectiveness for TSS, TN and TP which are as 89%, 31% and 72%, respectively. The overall reduction in storm water pollutants under water quality flow conditions will be higher since vegetated buffer strips will contribute to the storm water treatment.

As discussed earlier, the connection to a municipal sewer is not available nor is it considered advantageous at the project site, since the onsite treatment of the wastewater with the advanced MBR treatment systems create an effluent that is low in residual pollutants. The effluent can be safely disposed in one infiltration field which has a high distance of unsaturated below the field.

RESPONSES TO COMMENTS RECEIVED FROM THE LANI - KAILUA OUTDOOR CIRCLE

The following letter was received from the Lani-Kailua Outdoor Circle (6 pages)

THE LANI - KAILUA OUTDOOR CIRCLE

"Keeping Kailua Clean, Green and Beautiful since 1948!"

Draft Supplemental Environmental Impact Statement (DSEIS) Kapa'a Light Industrial Park
Lani-Kailua Outdoor Circle (LKOC) Testimony
01/04/2021

To:
City and County of Honolulu
Department of Planning and Permitting
650 South King Street
Honolulu, HI 96822
ATTN: Mr. Zachary Stoddard

From:
The Lani-Kailua Outdoor Circle
P.O. Box 261
Kailua, HI 96734
ATTN: Diane Harding, President
Email: lani-kailua@outdoorcircle.org

Dear Mr. Stoddard,

This letter is in response to the publication in "The Environmental Notice" of the Draft Supplemental Environmental Impact Statement (DSEIS) for Kapa'a Light Industrial Park - Kailua, and the request for public comment due on January 7, 2021.

The Kailua Light Industrial Park (KLIP) is a 79.1 acre parcel located within the Kapa'a watershed in Kailua, Oahu on land formerly zoned Preservation. It is presently divided into two parcels, an Industrial-zoned (I-1) Upper Level and a Preservation-zoned (P) Lower level pending final approval of an I-1 designation. The Lower level is within the Special Management Area (SMA) and the Coastal Management Zone (CMZ).

The Draft SEIS published in "The Environmental Notice" outlined changes KLIP made to its stormwater management, wastewater, and irrigation systems; to its roadway access; to the number of its proposed buildings; and to the size of its site's impervious ground cover. The Lani- Kailua Outdoor Circle (LKOC) is familiar with the development and has expressed concern over its ongoing expansion along the Kapa'a Stream corridor and the interconnecting waters of Kawainui Marsh and Kailua Bay. Our position is that protecting and restoring the Kapa'a watershed is essential to the long term health, productivity and economic wellbeing of the district.

LKOC supports the need for a SEIS of the previously accepted, but not fully-implemented FEIS, and appreciates the opportunity to re-evaluate the original plan and the proposed modifications to determine whether they are still viable and in the best interests of Hawaii's residents. Enclosed are our comments for your review.

Sincerely,

The Lani-Kailua Outdoor Circle
Diane Harding, President

Lani-Kailua Outdoor Circle. P.O. Box 261 Kailua, HI 96734 Email:Lani-kailua@outdoorcircle.org. www.lkoc.org

THE LANI - KAILUA OUTDOOR CIRCLE

"Keeping Kailua Clean, Green and Beautiful since 1948!"

The Lani-Kailua Outdoor Circle (LKOC) testimony on the Draft Supplemental Environmental Impact Statement (DSEIS) for Kapa'a Light Industrial Park
January 4, 2021

#1 - Size of the Development

The KLIP development covers 79.1 acres of the Kapa'a watershed in Kailua, Oahu. Fifty-four warehouses, with a combined footprint of 883,000 sq. ft. at buildout, would introduce wastewater leachate from two septic systems into a vegetated area along Kapa'a Stream.

Our concerns are:

1) Massive amounts of polluted stormwater would sheet flow across impervious pavement and enter underground storage tanks where it would receive minimal treatment before traveling through gravity-designed drainpipes into the Kapa'a stream corridor and Kapa'a Stream. (Figures 6.2.3.2. and 6.2.3.13)
2) Eleven feet of fill (fill C) would be added to an existing 30 (aprox.) feet of fill (fill B) on the lower level above a pre-existing but closed landfill (fill A). The proposed fill C would be contoured to direct the flow of stormwater to what was once the upslope direction of the site. It is unclear whether permits were granted for fill B; and the height of fill B above the level of fill A is also unclear. Fill A was not properly sealed when closed approximately 40 years ago. It rests in a basin of the Kapa'a watershed, upslope and adjacent to Kawainui Marsh.
3) Over the years, the Kailua community, through its Neighborhood Board, community groups and individuals, has consistently opposed the expansion of the KLIP development. The demand for warehouse space in the region has been low enough for KLIP to change the completion date of its expansion from 2025 to "further into the future" (p.48).
4) We believe the expansion of warehouses into the Lower level is not needed. This area of the Kapa'a watershed should retain Preservation zoning and be considered for soil remediation and reforestation.

#2 - Stormwater Treatment and Management

KLIP's proposed stormwater system has 6 drainage areas each with a specific storm water treatment and management process that uses: a combination of drain inlets and large diameter underground drainpipes (max diameter 48 inches); catchment baskets; detention vaults and basins; an energy dissipation structure; a below ground outfall with pretreatment screens; an armored outfall structure; a water reservoir with a free surface and an overflow weir; a manufactured treatment device (MTD) with a flow bypass for pollutant removal; concrete swales and drainpipes directing stormwater to an upstream outfall; vegetated swales; and roof runoff catchment systems directing stormwater into rainwater harvest tanks etc. (pp. 229-242)

Our concerns are:

1) Although some on-site stormwater is to be used for landscape irrigation, most of it is directed through pipes to detention vaults for partial treatment and then released to outfall drains that transport it off site to the vegetated Kapa'a Stream corridor. (p. 240) The detention vaults are designed to hold 23% of the 10-year storm event, leaving 77% of non-treated stormwater to bypass the tanks and make its way to Kapa'a stream. (p.253) Stormwater runoff entering the site through a culvert under Kapa'a Quarry Place road is also collected and stored. High peak discharge of runoff and streamflow will therefore overload the capacity of Kapa'a stream, causing downstream flooding

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and stream bank erosion, transporting large amounts of fine sediment into Kailua Bay where corals are already overstressed by unnatural turbidity.

2) While regulating the velocity and volume of outflow is essential, an equally important factor is minimizing the pollution load entering the stream. Stormwater transports fine particulate, oil, grease and toxic industrial effluents including heavy metals such as lead and mercury from petroleum products.
3) Kapa'a is a Total Maximum Daily Load (TMDL) steam listed as an Impaired Water Body under the Clean Water Act and KLIP stormwater management system must meet state environmental agencies and EPA standards.
4) The Low Impact Development (LID) designation is used in the DSEIS to describe KLIP's construction methods at the Lower site. LID promotes best management practices to reduce site disturbance, minimize impervious ground cover, promote water infiltration and address site constraints such as proximity to waterways and wetlands. KLIP's management plan for using expansive impervious surfaces, large capacity stormwater outflows into Kapa'a Stream and the aggressive regrading and filling of the Lower site, (essentially removing the last trace of its former topography), is inconsistent with the Low Impact Techniques (LID) designation. LID typically tries to "fit the development into the terrain, as opposed to changing the terrain to fit the development" as is the case in KLIP's overall plan.

#3 - Wastewater Treatment System

The 54 warehouses on KLIP will rely entirely on the use of on-site wastewater treatment units using both a conventional and alternative septic system. (p.159) The conventional system uses a two-stage process with anaerobic decomposition of organic matter and periodic pumping to remove accumulated sludge. After treatment, the liquid effluent is allowed to overflow into a leach field and filtrate into the ground. This system will be used at the Upper area. (p.159)

Due to its proximity to the wetland and Kapa'a Stream, KLIP would use an alternative system, an EPA recommended membrane bioreactor (MBR) technology believed to have a high treatment efficiency for organic load, TSS and nutrients. All the treatment in this system occurs in the process vessel in a settling chamber similar to a septic tank. The effluent from this innovative system is said to resemble the water quality of stormwater. Effluent from the MBR process vessel will be located in the Lower site and the effluent pumped to a location at a higher elevation "to ensure sufficient distance to the ground water below the bottom of the soil absorption" [sic]. (p.163) A second advanced wastewater treatment is also planned for the Upper site and both are part of a pilot project being conducted with oversight from the DoH. If successful, the MBR technology would be used in both the Upper and Lower project sites.

Our concern is

1) What alternative plan would be implemented if the MBR pilot project is not successful.

#4 - Grading and Addition of Soil to the Lower Site

Proposed changes to grading features in the Lower level (Figures 6.5.2.1 through 6.5.2.9) indicate an approximate 11-foot rise in fill material (fill C) in relation to the grade approved in the 2011 FEIS. From a natural topography perspective, this increase in grade is actually 11 feet of fill added to a substantially larger fill base of undocumented origin (fills A & B). The full height of the fill, if measured from the natural grade level along Kapa'a Road would be upwards of 40 feet. KLIP requires the increased grade in order to

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accommodate the redesigned stormwater management grid of underground pipes and storage tanks that have to be directed uphill into the Upper level to avoid draining into the former landfill.

Our concerns are:

1) This represents a substantial re-engineering of the Kapa'a watershed.
2) Although the plan favors shallow foundations under the new warehouse buildings, deeper drilling into the fill material for support is not ruled out.
3) Soil must be well compacted to avoid differential settlement and protect against landslides caused by earthquake or subterranean erosion.
4) Drilling should avoid disturbance of the landfill.

#5 – Traffic Impacts

Kapa'a Quarry Road traffic impacts, aesthetics, and safety issues are ongoing community concerns. Kapa'a Quarry Road is a "backroad" into Kailua Town used by drivers coming to and from H3 and the Kaneohe side of the island. It is a daily route for parents dropping children off at Le Jardin Academy and Kalaheo High School. The road is relatively narrow, unlit and dangerous as it winds its way along a changing vista of wetland pools, tall dry grasses and overhanging branches. It has no shoulders for second chances or telephone poles to mar the view and perhaps for these reasons, drivers find it a serene respite except for occasionally having to share it with thundering trucks from Kapa'a Quarry.

Our concerns are that, at buildout, KLIP will:

1) Bring an as yet undetermined number of customers to their site by way of this route.
2) Increase the area's carbon footprint and concentration of hydrocarbons in runoff.
3) Their estimated six hundred employees will add more cars and bicycles to the morning and evening commute, and, as noted in the 2011 FEIS, create gridlock at both ends of the road during peak hours.
4) A re-engineering of the road, a loss of scenic values, and substantial costs to future taxpayers are the likely outcomes.

#6 - Cultural Support

According to KLIP:
"The low-impact development of the Proposed Action would serve as an important example that industrial development can occur in an environmentally friendly way, and in a manner that is supportive and respectful to the community and its cultural values."

It is disingenuous to suggest that development in the Kapa'a Valley has demonstrated respect for cultural values given the now sterile nature of the land at the proposed development site. Prior and present mass grading has transformed an historic district that once supported lo'i kalo and fishponds into a barren, engineered and possibly toxic landscape that will take the concerted effort of many generations to return to environmental health or at the very least, prevent from further harm.

Our concerns are:

1) Despite KLIP's claims that the project site "is not of environmentally high value" (p. 346), clean water in Kapa'a Stream, Kawainui Marsh and Kailua Bay are of inestimable value, and are threatened by the proposed development plan.
2) The cultural and historical value of Kapa'a Valley cannot, and should not, be minimized for the sake of this development.

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#7 - LKOC Recommendations to DPP

Here are the Lani-Kailua Outdoor Circle recommendations to DPP.

1) Retain Preservation zoning and reject KLIP's development plans for the Lower level site.
2) Establish a fund, in partnership with the community, to buy back the Lower project site and remediate the area contiguous with Kawainui Marsh.
3) Improve oversight of the building process and require regular water quality testing of stormwater runoff into Kapa'a Stream.
4) Maintain Preservation zoning and SMA and CZM protection of this connected waterways.
5) Require KLIP to identify, collect, contain and remove pollutants that enter the underground holding tanks, remove them from the site and dispose of them in an environmentally sound manner.
6) A detailed Figure and explanation is needed to show the original, pre-development hydrologic conditions of the two development sites.
7) The Traffic Impact Analysis Report (TIAR), due after KLIP's final development density is determined should include in the analysis, traffic impacts from the additional driveways proposed for Kapa'a Quarry Road in the recently approved Kawainui-Hamakua Marsh Master Plan.

#8 - LKOC Questions for DPP

Here are the Lani-Kailua Outdoor Circle questions regarding the project as described in the DSEIS.

1) What is the velocity of the outflow from each of the drains?
    a. Is there data for the amount of sediment or soil disturbance that will occur within the stream bank?
    b. What impact will the outflow have on stream bank vegetation?
    c. At what level of outflow would turbidity become a problem in the stream?
    d. At what level of outflow would we expect flooding at Kapa'a Quarry Road?
2) Vault overflow is anticipated to occur 35 times a year.
    a. What would be the cumulative pollution load at the bypass sites?
    b. How will this be monitored?
3) What is the average volume of stream water delivered by each outflow drain into Kapa'a corridor and stream?
    a. What is the velocity of this discharge?
    b. How will this be measured?
    c. How many detention/holding tanks are there in each of the 6 drainage areas?
    d. How many have an updated MTD to capture particulate, heavy metal and petroleum pollutants?
4) What is the volume of water received from Kapa'a Place road and transported underground by culvert to the KLIP site?
    a. Are the proposed holding and treatment tanks large enough to hold the additional stormwater?
    b. Are additional treatment processes necessary to contain pollutants that may originate from the upslope, off site operations?
5) Given the massive clear cutting, grading and undocumented filling of the Lower site, how does KLIP justify the use of the Low impact Development (LID) designations in its public presentation in the DSEIS?
    a. What percent of the Lower site could be accurately characterized as LID?
    b. What ratio of pervious to impervious cover would justify an LID designation?

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   c. What protections would be afforded the stream bank, Kapa'a Stream, Kawainui Marsh and Kailua Bay under an LID plan?

6) How many toilets are planned for the warehouses?
   a. What is the maximum number of persons using the system on a daily basis?
   b. How often would the holding tanks be pumped?
   c. What precautions are being taken to avoid malfunction of the septic systems?
7) The proposed wastewater management system has a pilot program that is under review of the DoH.
   a. What is KLIP's alternate plan if the pilot plan is not successful?
   b. Would another SEIS be required to evaluate a new plan?
8) The alternative septic system proposed in KLIP's wastewater treatment plan would have effluent with characteristics similar to stormwater.
   a. Would the effluent be used on site? If so, in what way(s)?
   b. How will the on-site use of effluent/storm water be monitored?
   c. Will any effluent be drained into Kapa'a Stream?
   d. What regulations protect this type of "wastewater/stormwater" from introducing harmful pollutants into Kapa'a Stream?
9) Effluent from the alternate septic system will be pumped upslope and deposited along the perimeter of the site at a "sufficient distance to the groundwater" to avoid ground water pollution.
   a. How is this "sufficient distance" determined?
10) What would be the estimated weight of soil and concrete on top of the landfill after 11 more feet is added (as measured from the original grade)?
   a. What impact will the weight of 40+ feet of fill material have on landfill leachates?
11) What plans are there to relieve peak hour gridlock at both ends of Kappa's Quarry Road at full development buildout?
12) If re-engineering of Kapa'a Road is required for traffic safety, who will pay for it?

#9 – LKOC Additional Comments to DPP

These are what we believe are "Misleading Statements Made in the Kapa'a Light Industrial Park (KLIP) DSEIS" and deserve further consideration and amendment.

1) "This limited construction could involve minor modification of the stream banks or boundaries of wetland areas, and any fill to be deposited into stream beds or wetland areas will be only incidental." (p.342)
2) "There would be no disturbances to floodplains, designated wetland areas and water bodies." (p.343)
3) "[The proposed] stormwater treatment and management system would result in a long- term improvement of the runoff to the receiving waters - with resulting improvements of current impacts on water quality, stream bed erosion and subsequent sedimentation in the downstream marsh. This would improve the long-term productivity of the water bodies directly affected by the proposed project." (p. 342)
4) "The long-term productivity of biological resources would not be adversely affected by the proposed action." (p. 344)

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Responses to ***#1 - Size of the Development***

The KLIP development covers 79.1 acres of the Kapa'a watershed in Kailua, Oahu. Fifty-four warehouses, with a combined footprint of 883,000 sq. ft. at buildout, would introduce wastewater leachate from two septic systems into a vegetated area along Kapa'a Stream.
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4) We believe the expansion of warehouses into the Lower level is not needed. This area of the Kapa'a watershed should retain Preservation zoning and be considered for soil remediation and reforestation.

Response to initial paragraph: The Kapa'a Light Industrial Park (KLIP) will be developed on portions of the parcels TMK 4-2-15:013 and 014. The mentioned 79.1 acres indicate the combined size of the two parcels which includes the 43.5 acres of the core area the KLIP, with warehouse development and traffic area, and the remaining area that will remain with vegetation cover. There are presently nine conventional septic systems and two advanced wastewater system installed in the Upper site.

Response to 1): In the Lower site, storm water runs over pavement as sheet flow and enters drain inlets. From there it runs through drainpipes towards the treatment facilities at the Northern site perimeter. The underground tanks are detention vaults which release water to the MTDs over a period of 24 to 48 hours. The man function of the detention vaults is to provide flood control and shave off high peak flow rates of the discharged water. In addition to the detention vaults, there will be several rainwater harvesting vaults to provide irrigation water for the Lower site vegetated perimeter.

Response to 2): Fill will be added to reach the proposed finish grade. Some grading has been carried out in the Lower site under grading permits.

Response to 3) and 4): As was discussed earlier in Appendix B, the need for the KLIP development was established in the 2011-FEIS and this need still remains. (refer also to appliable statement by DPP in this Appendix B).

Responses to #2 - Stormwater Treatment and Management

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KLIP's proposed stormwater system has 6 drainage areas each with a specific storm water treatment and management process that uses: a combination of drain inlets and large diameter underground drainpipes (max diameter 48 inches); catchment baskets; detention vaults and basins; an energy dissipation structure; a below ground outfall with pretreatment screens; an armored outfall structure; a water reservoir with a free surface and an overflow weir; a manufactured treatment device (MTD) with a flow bypass for pollutant removal; concrete swales and drainpipes directing stormwater to an upstream outfall; vegetated swales; and roof runoff catchment systems directing stormwater into rainwater harvest tanks etc. (pp. 229-242)
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Response to initial paragraph: There is one existing and four planned energy dissipation devises to reduce soil erosion impacts from peak flow discharges in the Upper and Lower site, respectively . The same applies to armored outfalls which serve all releases of water to the Kapa'a Stream corridor. The water reservoir with free surface is an underground overflow structure for the detention volume that is made of larger diameter drainage pipes. There is one existing and four planned MTDs which filter the runoff upstream of the release to the Kapa'a Light Industrial Park.

Response to 1): The function of the detention vaults is to lower the discharge rates of storm water. The detention vaults were sized based on the difference of existing and future runoff volumes. In the Lower site, all storm water runoff flows through vegetated buffer strips; this includes the runoff to the detention vaults and the detention vault overflow. Therefore, all of the runoff will receive treatment, irrespectively whether or not water flows into the detention vaults or bypasses them. The analysis of how much storm water bypasses the detention vaults was also made for the typical metrological rain event. Besides identifying what happens to the storm water discharge under a recurrence period of 10 years, it is important to look at typical metrological events, such as normal rain events. This analysis of typical rain events is presented in **Appendix C** of this Final SEIS.

Response to 2): We agree that source control plays an important part of storm water pollution prevention efforts. The KLIP is operating under a NPDES No Exposure Exemption program. This means that material handling or workflow processes must avoid exposure to precipitation, since exposure can entrain pollutant in the runoff.

Response to 3): We acknowledge receipt of your comment.

Response to 4): The LID storm water development strategies will be implemented to the extent possible. An important element of LID storm water is infiltrating a significant amount of water at the site, which is beneficial for aquifer recharge and flood control. Infiltration is not possible at the project since it is a landfill, where infiltration would cause the generation of potentially harmful leachate. This notwithstanding, the storm water treatment approach at the project site is using LID elements at several locations. These LID strategies include the use of a 0.7-acre existing infiltration and detention basin adjacent to the paved portion of the Upper site, vegetated buffer strips at the site perimeter of the Upper site and vegetated buffer strips inside the Lower site, on top of the below ground detention vaults. The use of LID stormwater strategies will need to fit the terrain of the full build-out site.

Responses to #3 - Wastewater Treatment System

The 54 warehouses on KLIP will rely entirely on the use of on-site wastewater treatment units using both a conventional and alternative septic system. (p.159) The conventional system uses a two-stage process with anaerobic decomposition of organic matter and periodic pumping to remove accumulated sludge. After treatment, the liquid effluent can overflow into a leach field and filtrate into the ground. This system will be used at the Upper area. (p.159)
Due to its proximity to the wetland and Kapa'a Stream, KLIP would use an alternative system, an EPA recommended membrane bioreactor (MBR) technology believed to have a high treatment efficiency for organic load, TSS and nutrients. All the treatment in this system occurs in the process vessel in a settling chamber similar to a septic tank. The effluent from this innovative system is said to resemble the water quality of stormwater. Effluent from the MBR process vessel will be in the Lower site and the effluent pumped to a location at a higher elevation "to ensure sufficient distance to the ground water below the bottom of the soil absorption" [sic]. (p.163) A second advanced wastewater treatment is also planned for the Upper site and both are part of a pilot project being conducted with oversight from the DoH. If successful, the MBR technology would be used in both the Upper and Lower project sites.
Our concern is 1) What alternative plan would be implemented if the MBR pilot project is not successful.

Response to 1): The Pilot project is not about verifying the treatment technology of the MBR system. The pilot project is about the disposal of the treated effluent. The effluent of the NSF 350 certified MBR units is lower regarding residual pollutants, as represented by values such as BOD5, TSS and TN, than conventional onsite treatment and even central treatment system. Typically, onsite wastewater effluent disposal fields, soil absorption fields or "leach fields" for conventional septic systems, are sized on the basis of organic loading. Since the organic load of effluent of the MBR system is very low, the infiltration field in the pilot project is based on hydraulic loading. This approach results in a smaller size of this infiltration field. This field sizing approach has been done on the mainland and the DoH wants to ensure this already proven procedure can also be applied here in Hawaii. An alternative to infiltrating the effluent would be to discharge the treated wastewater effluent along with the storm water though the proposed storm water treatment systems. This approach was suggested by the DPP for investigation in the FSEIS. Additional disinfection of the effluent might be required if the effluent would be discharged on the surface. The outcome of the pilot project will provide guidance about the best way of the future disposal of treated wastewater effluent. The final design for the full build-out wastewater design will incorporate these findings.

Responses to #4 - Grading and Addition of Soil to the Lower Site

Proposed changes to grading features in the Lower level (Figures 6.5.2.1 through 6.5.2.9) indicate an approximate 11-foot rise in fill material (fill C) in relation to the grade approved in the 2011 FEIS. From a natural topography perspective, this increase in grade is actually 11 feet of fill added to a substantially larger fill base of undocumented origin (fills A & B). The full height of the fill, if measured from the natural grade level along Kapa'a Road would be upwards of 40 feet. KLIP requires the increased grade in order accommodate the redesigned stormwater management grid of underground pipes and storage tanks that must be directed uphill into the Upper level to avoid draining into the former landfill.

Our concerns are:
1) This represents a substantial re-engineering of the Kapa'a watershed.
2) Although the plan favors shallow foundations under the new warehouse buildings, deeper drilling into the fill material for support is not ruled out.
3) Soil must be well compacted to avoid differential settlement and protect against landslides caused by earthquake or subterranean erosion.
4) Drilling should avoid disturbance of the landfill.

Response to initial paragraph: As is delineated in Appendix D of this Final FEIS, the increased grade in the Lower site is required to provide sufficient flow energy to convey and treat the storm water and discharge it to the Kapa'a Quarry corridor. The grade inside the Kapa'a Stream corridor must remain undisturbed, therefore the elevation of at the discharge point of the storm water must be at the elevation where the foot of the site perimeter berm meets the existing grade in the Kapa'a stream corridor. The discharge of the storm water from the Lower site occurs next to the Lower site and is not directed uphill.

Response to 1): We do not agree that the development will reengineer the Kapa'a watershed. The discharge of storm water is based on areas calculated and not on height.

Response to 2): A soil engineering report will be conducted to determine the most suitable foundation method before construction of buildings will commence in the Lower site.

Response to 3): There are two geotechnical report of the Lower site, one in 2012 and one in 2019. Both identify the need and delineate the required type for soil compaction. The geotechnical reports also addresses the question of stability and degree of soil consolidation.

Response to 4): Drilling into the landfill body of the Lower site will be avoided o the extent possible.

Responses to #5 – Traffic Impacts

Kapa'a Quarry Road traffic impacts, aesthetics, and safety issues are ongoing community concerns. Kapa'a Quarry Road is a "backroad" into Kailua Town used by drivers coming to and from H3 and the Kaneohe side of the island. It is a daily route for parents dropping children off at Le Jardin Academy and Kalaheo High School. The road is relatively narrow, unlit, and dangerous as it winds its way along a changing vista of wetland pools, tall dry grasses, and overhanging branches. It has no shoulders for second chances or telephone poles to mar the view and perhaps for these reasons, drivers find it a serene respite except for occasionally having to share it with thundering trucks from Kapa'a Quarry.

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1) Bring an as yet undetermined number of customers to their site by way of this route.
2) Increase the area's carbon footprint and concentration of hydrocarbons in runoff.
3) Their estimated six hundred employees will add more cars and bicycles to the morning and evening commute, and, as noted in the 2011 FEIS, create gridlock at both ends of the road during peak hours.
4) A re-engineering of the road, a loss of scenic values, and substantial costs to future taxpayers are the likely outcomes.

Response to initial paragraph: We agree with efforts to improve traffic on the Kapa'a Quarry Road. In 2014 the Applicant funded a traffic safety study that recommended measures to increase safety on the Kapa'a Quarry Road and Kapa'a Quarry Place. The findings suggested, among other issues, to provide sufficient clearance beside the roadway. The proposed modification of the drainage ditch, as delineated in the **Appendix J of this Final SEIS**, would increase traffic safety on the Kapa'a Quarry Road along the frontage of the Lower site.

Response to 1): After the full build-out site development plan is accepted in the Final SEIS, the Applicant will conduct a Traffic Impact Assessment Report (TIAR). The results will be used to finalize traffic issues, including an agreement with the State to manage traffic at the intersections to the State roadways, Kalanianaole Hwy and Mokapu Blvd. The Applicant has already reached an agreement with the City and County for substantial frontage roadway improvements on Kapa'a Quarry Place. These frontage improvements have been implemented in accordance with the progress of the site development.

Response to 2): An important aspect of sustainable urban planning is to avoid long trips and commutes by bringing shops and workplaces closer to where people live. This reduces the need for car trips and fuel consumption, with the benefit of a lower carbon footprint. Providing places to do business at the KLIP helps windward companies to stay closer to home and serve their windward clients. The alternative of not having sufficient light industrial spaces within the Ko'olau Poko region would require businesses to find space on the leeward side of Oahu. This could require long trips and commutes for windward residents. During the 2011 Zone change there was wide community support of people who regarded the KLIP as beneficial to the community, since it would avoid long trips and commutes.

Response to 3): A new TIAR will be conducted after the full build-out site development plan delineated in the FEIS is accepted, as was agreed upon with the Accepting Agency.

Response to 4): The before-mentioned traffic safety study has recommended measure to improve safety conditions. A loss of scenic value can be mitigated by the visual impact mitigation measures, which are shown in **Appendix G** of this Final SEIS.

Responses to #6 – Cultural Support According to KLIP:

"The low-impact development of the Proposed Action would serve as an important example that industrial development can occur in an environmentally friendly way, and in a manner that is supportive and respectful to the community and its cultural values."
It is disingenuous to suggest that development in the Kapa'a Valley has demonstrated respect for cultural values given the now sterile nature of the land at the proposed development site. Prior and present mass grading has transformed an historic district that once supported lo'i kalo and fishponds into a barren, engineered and possibly toxic landscape that will take the concerted effort of many generations to return to environmental health or at the very least, prevent from further harm.
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1) Despite KLIP's claims that the project site "is not of environmentally high value" (p. 346), clean water in Kapa'a Stream, Kawainui Marsh and Kailua Bay are of inestimable value, and are threatened by the proposed development plan.
2) The cultural and historical value of Kapa'a Valley cannot, and should not, be minimized for the sake of this development.

Response to initial paragraph: We believe that our statement is correct and portrays the situation in a positive and respectful way. The essence of the statement supports the so-called Triple Bottom Line (describes earlier in the Appendix) which balances the aspects of the environment, social and financial wellbeing of the community.

The landfill was created about 60 years ago when parts of the Kapa'a valley were filled with waste and material from quarry operations. This converted the valley into a deposit of excess material, converting the existing landscape and vegetation. In addition to the landfill at the project site, there are two additional landfills in the area.

An important trend is the redevelopment of former landfills to convert them to higher value use. There are many examples of successfully converting landfill, among them some here in Hawaii. Converting the

landfill within the Lower site as a site where windward businesses can find light industrial zoned space is a good development for these windward community, since it reduces the need to use open space for the development. The Ko'olau Poko Sustainable Community Plan identifies the project site as suitable for the industrial development.

The sealing of the former landfill will lower impacts which are caused by runoff and leachate from the existing landfill body.

Response to 1): It is evident from the tone of our discussion that the reference of "not environmentally high value" does not address the Kapa'a Stream, Kawainui Marsh and Kailua Bay. The reference to "not environmentally high value" refers to so called brownfield development where land of "lower value" such as landfills or contaminated site are used for suitable development rather than using valuable open land with vegetation to place developments. Brownfield development supports responsible development.

Response to 2): We agree that environment must be protected, and effective impact mitigation is required.

Responses to #7 - through #9:

Response: These comments and questions are directed to the DPP

RESPONSES TO COMMENTS RECEIVED FROM HAWAII'S THOUSAND FRIENDS

The following letter was received from Hawaii Thousand Friends (12 pages)

Hawaii's Thousand Friends
335 Hahani Street #342132 * Kailua, HI 96734 * Phone/Fax (808) 262-0682 E-Mail: htf3000@gmail.com

January 7, 2021

Zack Stoddard
Department of Planning and Permitting
Land Use Approval Branch
Zachary.stoddard@honolulu.gov

Manfred Zapka
Consultant
Sustainable Design & Consulting, LLC
sustainableDC@gmail.com
Senator Chris Lee
senlee@capitol.hawaii.gov

Draft Supplemental Environmental Impact Statement
Development of New Portions of the Kapa`a Light Industrial Park

In reconsidering the proposals in the SEIS it is important to understand that there is no such thing as a safe landfill. No matter how many barriers, liners and pipes are installed to mitigate the risk, landfills will always leak toxic chemicals into the soil and water.

Despite repeatedly stressing that permitting an industrial park adjacent to Kapa`a Stream, a 303(d) Total Maximum Daily Load (TMDL) impaired water body, and the Class 1.b waters of Kawainui Marsh, a Wetland of International Importance under the Ramsar Convention, would cause negative impacts to these two water bodies the Department of Planning and Permitting and the City Council approved the zone changes, FEIS and SMAP for the Kapa`a Industrial Park.

> Under Section 303(d) of the Clean Water Act, Hawai`i is required to evaluate all available water quality-related data and information to develop a list of waters that do not meet established WQS (impaired) and those that currently meet WQS, but may exceed it in the next reporting cycle (threatened). Hawai`i then must develop a TMDL for every pollutant/waterbody combination on the list. An essential component of a TMDL is the calculation of the maximum amount of a pollutant that can occur in a waterbody and still meet WQS. Within the TMDL the state allocates this loading capacity among the various point sources and non-point sources. Permits for point sources are issued through EPA's National Pollutant Discharge Elimination System, or NPDES program.
> It is the objective of Class 1 waters that these waters remain in their natural state as nearly as possible with an absolute minimum of pollution from any human caused source.

1

> Waste discharged into these waters is prohibited. Any conduct, which results in a demonstrable increase in the levels of point or nonpoint source contamination in Class 1 waters, is prohibited. (HAR Chapter 11-54)

It is our understanding that approval of the 2011 FEIS was partially based on the proposed advanced onsite wastewater treatment system that increased removal of biological oxygen suspended solids and nutrients from the wastewater making water useable for irrigation. The stormwater treatment system was also changed for the lower portion to collect and harvest water for irrigation and recycled water uses inside buildings.

In the SEIS the superior highly praised and approved wastewater system has been changed to a system that does not make water reusable for irrigation or other purposes and is currently a pilot project at the industrial. The new system will use a membrane bioreacor (MBR) technology, which includes infiltration fields at the site perimeter which boarders Kapa`a Stream.

> Why would the City accept the system recommended in the SEIS for the lower landfill section that will not recycle water for reuse and ***"...would be closer to the surface and ground water..."*** with the ***"infiltration point of leach fields ... having short vertical and horizontal distances to travel, there... would be a probability of insufficiently treated wastewater reaching the ground water and/or seeping into the Kapa`a Stream corridor or drainage ditch"?*** (Pg 160)
>
> Why would the City accept a new system that places three large stand-alone, containerized treatment plants with infiltration fields at the site perimeter which boarders Kapa`a Stream riparian area increasing the possibility of spillage into Kapa`a Stream and erosion of stream banks?

In reviewing the SEIS it is important to understand that ***stormwater*** from the transfer station and ***all stormwater*** from the industrial park is directed and discharged into Kapa`a Stream.

> Note in attached Figure 4.3.4.1 from the approved 2011 FEIS that stormewater from the city transfer station is directed to the *culvert underneath the roadway* onto the landfill for disposal into Kapa`a Stream.
>
> Figure 4.3.4.1 shows that no stormwater will be directed toward the ditch along Kapa`a Quarry Road even though the ditch was designed to receive seepage from the landfill to filter out contaminants before going into Kawainui Stream. Stormwater directed towards the ditch also lessens the pollution load into Kapa`a Stream.
>
> Instead Figure 6.2.3.13 in the SEIS shows that all waste and storm water from the lower landfill section **three** stand-alone containerized **wastsewater** membrane bioreator treatment plants and **three stormwater** *drain outlets* is directed into Kapa`a Stream, which runs into Kawainui Marsh and eventually into Kailua Bay.
>
> What is the tipping point when Kapa`a Stream ceases being a stream and becomes a drainage ditch?

2

Kapa`a Stream is a Class 2 Inland Stream. The objectives of Class 2 waters, as they apply to Kapa`a Stream, are to protect its uses for recreational purposes, the support and propagation of fish and other aquatic life, and agricultural and industrial water supplies. Uses to be protected include all uses compatible with the protection and propagation of fish, shellfish, and wildlife and with recreation in and on these waters. Existing uses include support of recreational activities, aesthetic values, and traditional and customary native Hawaiian beliefs, values, and practices. (§HAR11-54-3)

In **2004** Kapa`a Stream was listed on Hawaii's 303(d) List of Impaired Waters under the Clean Water Act due to water quality being impaired by elevated turbidity, total suspended solids (TSS, nutrients (TN, TP) and metals. Kapa`a Stream flows into Kawainui Marsh and beyond to Oneawa Canal, Kailua Bay and the ocean.

> In 2004 Kapa`a landfill was placed on the State Priority list of sites eligible for possible listing under CERCLA? Was the landfill ever listed?

In **2007** Total Maximum Daily Loads (TMDL) were established for Kapa`a Stream for total suspended solids, nitrogen and phosphorus in wet and dry seasons for the quarry and city facilities within Kapa`a Valley. Waste Load Allocations (WLAs) for Kapa`a Stream TMDLs are to be implemented through compliance with NPDES permit conditions and by following stormwater management plans associated with those permits.

According to the ***City's Implementation and Monitoring Plan for Kapa`a Stream Waste Load Allocation for the City and County of Honolulu Municipal Separate Storm Sewer System NPDES Permit NO. HI S000002*** the City will:

1. Assist DOH in assessing the potential of existing businesses within the Kapa`a Industrial park to determine if there are outreach opportunities to educate business owners about potential pollutant reductions. However, due to the difficulty in quantifying future pollutant load reductions from this activity, no pollutant load reductions have been included for accounting purposes at this time.
2. Assist DOH in engaging the surrounding land users to determine if there are additional opportunities to alter existing business practices to realize pollutant load reductions via education and outreach.

    - How often since the NPDES was approved in 2015 has the City assisted DOH in ***assessing the potential of existing businesses within the Kapa`a Industrial park to determine if there are outreach opportunities to educate business owners about potential pollutant reductions?***
    - Did this outreach result in any change in behavior or increase awareness of the importance of reducing/eliminating pollutants that could run into Kapa`a Stream?
    - Were the City and DOH able to overcome the ***difficulty in quantifying future pollutant load reductions from this activity*** in the last six years and assign ***pollutant load reductions?*** If so, in the FSEIS identify the entities that were assigned load reductions.
    - How often since approval of the NPDES in 2015 has the City assisted DOH ***in engaging the surrounding land users to determine if there are additional opportunities to alter existing business practices to realize pollutant load reductions via education and outreach?***

3

NPDES Permit No HI S000002

- Has the City reached the WLA Reductions from the Kapa`a Closed Sanitary Landfill for Kapa`a Stream identified in this permit?
- Has the City complied with the completion of construction of structures due the end of FY 2020 and are any of the construction projects associated with Kapa`a Landfill or Kapa`a Stream?

A 2013 Municipal Separate Storm Sewer System (MS4) Compliance Audit Report of the City and County of Honolulu lists ***Industrial Park*** under Permit NO. HI S000002 Part F Table 6.10 Load Reductions Required to Achieve TMDLs.

In the FSEIS identify who is responsible for ensuring that the required load reductions are achieved as shown in this audit - the City, the industrial park owner and/or individual tenants?

On October 16, 2013 the City Department of Environmental Services received a Notice of Apparent Violation (NAV), National Pollutant Discharge Elimination System (NPDES), Municipal Separate Storm Sewer System (MS4) from the State Department of Health noting that the City was out of compliance.

Since receiving this NAV has the City met the Load Reductions Required to Achieve Kapa`a Stream TMDLs for the industrial park and come into compliance?

When the industrial park expands onto the lower landfill section will the City continue to be responsible for the Kapa`a Stream WLA allocations or will the responsibility be on the industrial park owners and/or tenants?

Does Kapa`a Stream currently meet EPA water quality standards?

In the FSEIS describe how the industrial park and businesses within the lower landfill section will ensure that stormwater leaving business sites and the industrial park meets water quality standards.

To prevent continuous degradation and nutrient loading in Kapa`a Stream and ensure that water leaving the lower landfill section is as clean as possible as it migrates from Kapa`a Stream into Kawainui Marsh and eventually into Kailua Bay the City should require the industrial park to hook up to the City municipal sewer system before approving any construction on the lower landfill site.

The SEIS lacks specifics on what Best Management Practices (BMPs) will be used after construction and for the life of the industrial park. Without this information it is impossible to whether proposed BMPs will be adequate to prevent polluted stormwater from going into Kapa`a Stream. Included this information in the FSEIS.

The FEIS was approved in 2011 and the applicant received the SMAP in 2014 yet no wastewater or drainage infrastructure has been installed in the lower landfill section. To prevent further changing of wastewater and drainage systems and topography of the lower landfill section approval of this SEIS should contain the requirement that stormwater and wastewater infrastructure must be put in before approval of any structures on the lower landfill section.

4

The SEIS incorrectly refers to the ditch that runs alongside Kapa`a Quarry Road as ***previous.*** This is incorrect. The ditch still exists but is overgrown and unable to fulfill its designed function of filtering out pollutants from stormwater seeping from the landfill before going under Kapa`a Quarry Road into Kawainui Marsh. In the FSEIS change any reference to the ditch, as ***previous*** to existing.

The approved 2011 FEIS states "Measures proposed include maximizing open space within their property with landscaping and a "green" landscape barrier around warehouses, improving management of stormwater runoff discharged from the site and using harvested rainwater from buildings to support irrigation of landscaping, which decreases discharges." (Pg 7-9)

Under the SEIS all the green space and landscaped barriers around warehouses are gone with 27 acres of a pervious surface changed to impervious thus eliminating the ability to capture stormwater runoff and reuse the captured water for other purposes.

Pg 183 SEIS "In the case of high peak flows rainwater cannot be percolated into pervious surfaces and be consumed by vegetation covers, so drainage flows from increasingly impervious surfaces. In general, areas that were converted to a higher imperviousness can cause higher peak flow rates. The Proposed Action would convert land from pervious to impervious surface and therefore would add adverse effect from high peak runoff rates if no mitigation measures were taken"

Pg 247 According to Table 6.2.5.1 the 3 drainage areas in lower site 100% will be impervious. (See attached ***Figures 6.7.1.2 and 6.7.1.3)***

- The proposed modifications in the SEIS increase impervious surface for the lower landfill section from the approved 2014 SMAP of 61% to SEIS proposed 74% which eliminates the much touted Low Impact Development (LID) techniques such as stormwater harvesting and reuse.
- In the FEIS explain why it is necessary to eliminate the touted Low Impact Development (LID) approaches.
- In the FSEIS identify the mitigation measures that will prevent adverse impacts to Kapa`a Stream from runoff that is not slowed and/or captured when green spaces are eliminated.
- In the FSEIS explain why it is necessary to increase pervious surfaces in the lower landfill section and eliminate almost all of the green space and the ability to capture water for reuse in an area that is adjacent to Kapa`a Stream and Kawainui Marsh.
- Accepting the SEIS is going backwards

Pg 223 If specific **low impact development** (LID) strategies approved in the 2014 SMAP that were to be used to treat storm water and control flow events will no longer be used does this deletion negate the 2014 SMAP?

The SEIS proposed wastewater system is a Membrane Bioreactor (MBR) treatment unit. According to the SEIS there will be three MBR units in the lower landfill section.

In the FSEIS explain if the drain outlets shown in Figure 6.2.5.2 and Figure 6,2.5.4 are the same as the ***treatment systems*** and ***stormwater outfall for drainage areas*** as shown in Figure 6.2.3.13 and if the same systems will be used for storm and wastewater.

5

The FEIS is silent on how far the pipes will extend over the riparian area of Kapa`a Stream. Placement is critical to prevent erosion and prevent large amounts of water from inundating Kapa`a Stream and its marine life. In the FSEIS include information on placement of the pipes shown in Figure 6.2.3.13 including how far they will extend into Kapa`a Stream riparian area

In the FSEIS provide information on the anticipated amount of stormwater and wastewater expected to come from each of the six drainpipes (3 wastewater and 3 stormwater shown in Figure 6.2.3.13, Figure 6.2.5.2, Figure 6,2.5.4) per day and deposited into Kapa'a Stream during the dry season and during the wet season.

Since Kapa`a Stream is a TMDL impaired waterbody and the receiving water for each MBR and stormwater system in the lower landfill section will each MBR and stormwater system be assigned a waste load allocation?

What State or City agencies, if any, will monitor and test the membrane bioreactor systems (MBR) to ensure that they are routinely and properly maintained and that the water flowing into Kapa`a Stream meets EPA water quality standards?

Will the MBR systems be above ground or below ground? If below ground what is the required depth for each unit? If above ground what is the height of each unit?

In the FSEIS explain if the landfill is stable and deep enough to accommodate membrane bioreactor (MBR) systems without breaking the cover?

What are the dimensions of each of the three MBR systems identified as (C), (D), and (E) shown in Figure 6.2.3.13?

What is the height of each MBR if placed above ground?

The SDEIS is silent on the types of chemicals that will be used to achieve low phosphorus concentrations in the effluent and to produce biosolids that are acceptable for disposal?

> The FSEIS must provide information on the types of chemicals that will be used in the MBR processes and provide information on whether they are safe for the marine life in Kapa`a Stream and Kawainui Marsh.

Does an operator of a MBR system need special training or qualifications?

In the FSEIS describe the type(s) of debris removal processes that will be used in the MBR systems to remove debris before wastewater goes into the system?

In the FSEIS explain how and where debris removed from the MBR process will be disposed?

In the FSEIS explain what chemicals, if any, will be used to process the waste sludge and whether the chemicals are safe for marine life?

In the FSEIS explain how and where the sludge, treated with chemicals, from the MBR treatment systems will be disposed.

6

In the FSEIS provide information on the porous nature of the MF/UF membranes used in MBR system that allows small organic compounds such as pesticides, pharmaceuticals, endocrine-disturbing chemicals and/or disinfection by-products to permeate through the membrane and the possible impact on the water quality and marine life in Kapa`a Stream and Kawainui Marsh.

Settlement is a major geotechnical aspect of the restoration and development of a closed landfill. Municipal solid waste settlement will cause problems for after use development, such as severe distortion and damage to buildings, sagging surface channels and the ground resulting in water ponding, reversed flow of underground drain, cracking of surface paving causing infiltration of water into the municipal solid waste.

In the FSEIS provide information on whether the landfill has been properly compressed.

The SEIS is silent on how long the landfill will need to compress and settle after all the soil is placed on the landfill to reach the 50 feet before it is safe to be built on. This information must be in the FEIS.

Since we are unable to find closure information for the Kapa`a Landfill, lower section of Kapa`a Industrial Park, it is unclear if the landfill was closed according to required DOH and EPA approved practices.

Landfills are the third-largest source of human-related methane emissions. Uncontrolled biodegradation in a landfill can cause methane gas emissions, ground water pollution and unstable sub-soil conditions. Really old organic materials in a landfill slowly release methane as they anaerobically degrade.

Before the lower landfill section is allowed to be covered with 390,000+ cubic yards of material, topped with 15 warehouses that are 40 feet tall and 27 acres of pervious surface converted to impervious surfaces and opened to the public it is imperative that City and state agencies first must ensure that 1) gas emissions will not build up and leak out under the weight and 2) that the landfill is solid enough to hold the weight without sliding, sinking or collapsing causing human safety and environmental problems.

According to landfill experts when building on a landfill, it is imperative to consider consolidation-time-settlement relationships and load bearing capacities developed from field and laboratory data. Information on this subject is missing from the SEIS. It must be provided in the FSEIS.

When waste is placed in landfills, over time the waste decomposes and sweats. This liquid, leachate, is hazardous, a known health risk and must be collected for disposal. Leachate can escape the landfill and contaminate ground and surface waters.

In the years since the landfill was closed has leachate been collected from the landfill? If so, in the FSEIS provide information on when and how much leachate was collected and where, how and where it was disposed.

7

Has the Kapa`a Stream, water in the ditch along Kapa`a Quarry Road and water in Kawainui Marsh been tested for hazardous constituents that could have seeped from the landfill?

Since the landfill has only been closed for approximately 23 years is leachate collection on going?

It is common knowledge that landfills can continue to produce gases for more than 50 years. Kapa`a landfill was closed about 23 years ago.

For the safety and health of the public and the environment it is important that the FSEIS contain information on if and when methane was discovered in Kapa`a landfill how it was handled.

In the FSEIS provide information on whether methane gas still exists in the landfill.

In the FSEIS explain if methane gas was encountered during the soil survey and/or has been inadvertently discovered during other activities. If methane gas has been discovered explain how it was treated.

Hawai`i Administrative Rules Title 11 Chapter 58.1 Solid Waste Management Control §11-58.1-11 are in place to ***ensure the protection of human health and the environment.***

"Post-closure" as defined in this section means ***the requirements placed upon landfill disposal sites after closure to ensure their environmental safety for a thirty-year period.***

Kapa`a landfill has been closed about 23 years. It is assumed that the City and County and State Department of Health are following the closure plan. The question is once buildings, storm and wastewater infrastructure are placed on or within the landfill who is responsible for following the closure plan and protecting human health and the environment.

The FSEIS must identify the party(ies) who will be responsible for following the plan and protecting the public and environment over the remaining years.

§11-58.17-17 Municipal solid waste landfills – closure and post-closure care (a) calls for a final cover system to be designed and installed when a landfill is closed. We assume that a cover, which minimizes infiltration, was installed when the landfill was closed.

In the FEIS describe the type of cover system that was placed over the landfill.

In the FSEIS provide information on the human health and environmental consequences if a proposed MBR system placed under ground penetrates the cover allowing infiltration and erosion.

The SEIS states that "The proposed warehouses are ***relatively light structures that could use shallow foundations***, such as raft foundations" but "If found to be necessary, ***some form of deep foundation might be considered*** for selected buildings though deep foundations using piles are not anticipated to be extensively used for the proposed site, if at all."

8

Did the soil survey reveal the load bearing capacity of the landfill and the ability of the material in the landfill to support pilings for buildings?

The SEIS states that "The soil bearing capacity within the Lower portion of the proposed site and the most suitable type of foundation will be determined before construction of the structures begins."

- The SEIS does not provide information on the weight of each of the 15 structures or the total weight of the soil rocks etc. that will be brought in to reach 50 additional feet. So how it is possible to determine that the landfill can safely hold the additional weight.
- Waiting until after permits have been given and construction is about to begin to determine the soil bearing capacity is to late.
- The SEIS says that a soil survey was conducted so why isn't the soil bearing capacity of the lower portion known and included in the SEIS?

Once buildings are built on the lower landfill section the entire area will be open to the public. It is a concern that if the landfill was not properly closed with gas extraction and maximum settlement major health and safety issues could occur such as gas intrusion, distortion and damage to buildings, and sagging and cracking of surfaces

Pg 131 "The landfill operation was discontinued more than 40 years ago, and therefore the landfill should have reached a degree of stability that is necessary to substantially mitigate the engineering and health and safety concerns associated with waste degradation."

This is an incorrect statement. Kapa`a Landfill was closed in 1997, which is only 23 years ago.

In the FSEIS describe ***degree of stability?***

In the FSEIS provide information on whether the City has installed a gas collection and control system for the Kapa`a landfill presently the site of Kapa`a Industrial Park. If so explain how much methane gas has been extracted and if methane gas extraction is on going.

The SEIS is silent on how many tons of soil, rock, topsoil, rap, asphalt etc. will be brought in to cover the lower landfill to reach the requested 40 to 50 feet. This information must be in the FSEIS.

What is the soil compaction requirement after all soil etc. has been brought onto the lower landfill section before the landfill is safe to build on?

The SEIS is silent on the cumulative effect of piling 40 to 50 additional feet of rock, soil etc on top of the landfill. How much will the additional weight compress the existing solid waste in the landfill? Is there a time limit between closure of the landfill and the ability to safely construct buildings?

The attached power point titled ***Kapaa Indus prk topo map SEIS 2020*** shows the comparison in height for the lower landfill section between the 2011 DEIS and site elevations in 2020.

9

It is estimated that 20 to 30 feet of trash was added to the landfill site when it was active. Considering that the former Kapa`a Valley wetland was about 10 feet, which is the height of Kawainui Marsh, the present height of the landfill should be approximately 40 feet.

It is our understanding that the applicant has approval to raise the finished grade from 25 to 39 feet. So why is the increase to 50 feet necessary? As far as visual pollution and impacts on migratory birds any increase in grade is bad enough.

If 40+ feet is added to the topside of the lower landfill section it will about the same height as the middle section of the industrial park noted by the circle next to Nikola's Auto Center, which is 85 feet. Increasing the height by 40 feet makes it convenient to create a contiguous paved area from the mauka end of the industrial park to the makai end next to Kapa`a Quarry Road except the green in between Nikola's Auto Center and the parked cars is a stream.

Adding 40 to 50 feet to the lower 26 and 27 feet and placing 40 foot tall warehouses on top of the approximately 77 feet will create a 117 foot high barrier that will make all the warehouses visible from almost any where in Kailua. Presently the City's transfer station and lights from the industrial park are seen over the flat Kawainui Marsh.

SEIS Pg. 347 "...the Proposed Action would cause irreversible and irretrievable changes in near and distant views from view planes around Kawainui Marsh, Kailua town, H3-Freeway and roads adjacent to the property site. The proposed visual impact mitigation, such as the vegetative buffer zones around the site perimeter along the Kapa`a Quarry Road would significantly reduce the intensity of the visual impact from view planes on the adjacent roads and around Kawainui Marsh."

This is a correct statement. Once the land is raised another 40 to 50 feet to the interior 34 feet there is no hiding the 40 feet tall buildings or the lights on and from the buildings.

A berm that is 2 feet higher than the ***full build out interior site*** will not hide anything.

There are no mitigation measures that can negate the negative visual impact of the 117 foot high barrier along Kapa`a Quarry Road. Have soil studies been conducted to ensure that increasing the height 77+ feet along Kapa`a Quarry Road and adding 40 feet tall buildings will be safe for drivers along the road?

Have studies been conducted that evaluate the continual flooding of Kapa`a Quarry Road and impacts from the increased height such as erosion to the hillside?

Raising the higher end of the lower section another 40 feet on top of the 43 feet = 83 feet. Add 40 feet tall buildings on top of that and nothing is hidden.

If the interior of the lower section is raised 40 feet added to the present 34 feet = 74 feet. Add 40 feet to the lower section 27 feet along Kapa`a Quarry Road = 67 feet. The dimensions of the earthen berm are not given so it is impossible to calculate the height the berm, on top of the 67 feet along Kapa`a Quarry Road, would have to be to provide any visual relief.

10

Not only will the buildings be visible during the day from many areas in Kailua but the night lights could be a deadly for migratory birds that fly mauka to makai over the dark Kawainui Marsh and through the relatively dark Kapa`a Valley.

The SEIS is silent on impacts to migratory birds from lights in parking areas needed for safety and on buildings that are approximately 117 feet in the sky.

Kawainui Marsh is habitat for four endangered water birds and a stopping off place for migratory birds so the FSEIS must contain meaningful and attainable mitigation measures to help ensure that migratory and endangered bird species are not harmed or killed.

Were studies conducted to see and understand the impacts to Kapa`a Stream from increasing the existing height from 30+ and 40+ feet to 70+ to 80+ feet in the area adjacent to the stream?

The FSEIS must provide information on how the increased height will impact Kapa`a Stream and how adding layers of dirt will not cause erosion into the stream.

Noise barriers pg 345 "long term noise during operations could be mitigated through several measures that include orienting large warehouse doors away from the marsh, installing noise barriers to shield adjacent areas that are most sensitive, housing noisy equipment indoors or under noise attenuating containments and avoiding unnecessary idling of heavy trucks."

The industrial park just provides spaces for businesses so it is not their obligation to ensure that noisy equipment is indoors, that doors to do open toward Kawainui Marsh and the ocean to get trade winds or police heavy trucks to prevent idling noise. So unless there are some unknown rules and or the city will police undesirable and unhealthy actions if approved there is not much that can be done about these issues.

The industrial park could install some sort of noise containment but nothing was identified in the SEIS. If there are structures or techniques that could be installed to contain noise they should be in the FSEIS.

There is no comprehensive topographic map of the lower landfill section in the SEIS. Figures 6.3.2 and 6.3.2 titled ***topographic of the project site*** and ***Lower site with grading recorded in 2017*** just show wavy lines without any depth, width or height calculations.

Three topographic maps of the lower landfill section must be included in the FSEIS.

- One map showing the depth, width and height at the time the landfill closed in 1997.
- Two topographic maps, one for 2017 and one for 2019 showing depth, width and height for the lower landfill section.

The SEIS does not provide any information on if the soil, sand, rap and asphalt shown in attached photos titled ***Kapaa ind park elevation 2019*** and ***Kapaa industrial park 8/2014.***

In the FSEIS provide information on how much fill has been brought onto the lower site for at least the past five years and if the soil, rap, rocks, etc. ware tested for contaminants before brought onto the landfill site

11

The FSEIS must explain if the fill that has been brought in has been compacted and to what degree.

The SEIS does not mention that Kapa`a Quarry Road and the lower section of the industrial park are within the City and County defined Extreme Tsunami Evacuation Zone. There is no discussion on evacuation plans since a tsunami would overtake the lower section of the industrial park and the only escape route Kapa`a Quarry road. (Attached titled ***tsunami Kapaa C&C map 2015***)

Pg 253 "...mean monthly rainfall intensity was taken from the Rain Atlas of Hawaii and combined with the recoded mean days with rainfall in the Kailua Area"

In the FSEIS identify the sites in Kailua where the rain data used in this SEIS was collected.

CC:
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12

Response to the following text on page 2:

> It is our understanding that approval of the 2011 FEIS was partially based on the proposed advanced onsite wastewater treatment system that increased removal of biological oxygen suspended solids and nutrients from the wastewater making water useable for irrigation. The stormwater treatment system was also changed for the lower portion to collect and harvest water for irrigation and recycled water uses inside buildings.
>
> In the SEIS the superior highly praised and approved wastewater system has been changed to a system that does not make water reusable for irrigation or other purposes and is currently a pilot project at the industrial. The new system will use a membrane bioreacor (MBR) technology, which includes infiltration fields at the site perimeter which boarders Kapa`a Stream.
>
> > Why would the City accept the system recommended in the SEIS for the lower landfill section that will not recycle water for reuse and *"...would be closer to the surface and ground water..."* with the *"infiltration point of leach fields ... having short vertical and horizontal distances to travel, there... would be a probability of insufficiently treated wastewater reaching the ground water and/or seeping into the Kapa`a Stream corridor or drainage ditch"?* (Pg 160)
> >
> > Why would the City accept a new system that places three large stand-alone, containerized treatment plants with infiltration fields at the site perimeter which boarders Kapa`a Stream riparian area increasing the possibility of spillage into Kapa`a Stream and erosion of stream banks?

Response: The advanced onsite wastewater treatment will still be implemented. In fact, the 2011-FEIS proposed wastewater system was a septic tank effluent pumping (STEP) system which used a recirculating sand filter as the central treatment facility. In the SEIS, this wastewater system was replaced by the more effective membrane bioreactor (MBR) technology. The specific MBR technology used at the project site is an NSF 350 certified system. The specific technology has been tested by the NSF to produce effluent which can be reused at the site. NSF certifications are used in the wastewater treatment industry to achieve code compliance.

The referenced discussion on page 160 of the DSEIS describes typical processes and impacts associated with conventional septic systems. Conventional septic systems are widely used and are the most common onsite wastewater technology. Conventional septic systems produce levels of wastewater treatment that are endorsed by the EPA and State agencies. The text on page 160 of the DSEIS describes typical shortcomings of conventional septic systems, specifically at locations where there is only limited distance between the soil absorption field and the saturated water horizon. Also, septic systems do not remove much of the nutrients in the wastewater effluent. The benefits of the alternative wastewater system were described.

The description of "three large stand-alone, containerized treatment plants with infiltration fields at the site perimeter which boarders Kapa`a Stream riparian area increasing the possibility of spillage into Kapa`a Stream and erosion of stream banks?" does not portray the actual site conditions. There are no containerized wastewater treatment plants with infiltration fields at the site perimeter.

Response to the following text on page 2:

> In reviewing the SEIS it is important to understand that ***stormwater*** from the transfer station and ***all stormwater*** from the industrial park is directed and discharged into Kapa`a Stream.
>
> Note in attached Figure 4.3.4.1 from the approved 2011 FEIS that stormewater from the city transfer station is directed to the ***culvert underneath the roadway*** onto the landfill for disposal into Kapa`a Stream.
>
> Figure 4.3.4.1 shows that no stormwater will be directed toward the ditch along Kapa`a Quarry Road even though the ditch was designed to receive seepage from the landfill to filter out contaminants before going into Kawainui Stream. Stormwater directed towards the ditch also lessens the pollution load into Kapa`a Stream.
>
> Instead Figure 6.2.3.13 in the SEIS shows that all waste and storm water from the lower landfill section **three** stand-alone containerized **wastsewater** membrane bioreator treatment plants and **three stormwater** *drain outlets* is directed into Kapa`a Stream, which runs into Kawainui Marsh and eventually into Kailua Bay.
>
> What is the tipping point when Kapa`a Stream ceases being a stream and becomes a drainage ditch?

Response: In accordance with our observations and review of document the statement that "*that stormwater from the transfer station and all stormwater from the industrial park is directed and discharged into Kapa`a Stream"* is not consistent with our available data. The referred to Figure 4.3.4.1 of the 2020 Draft SEIS document is shown below.

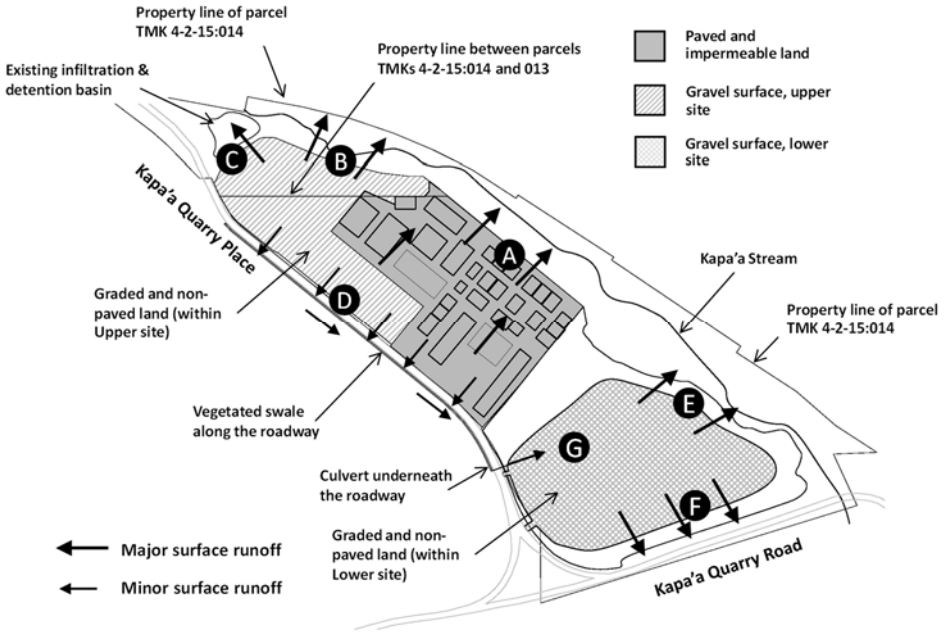
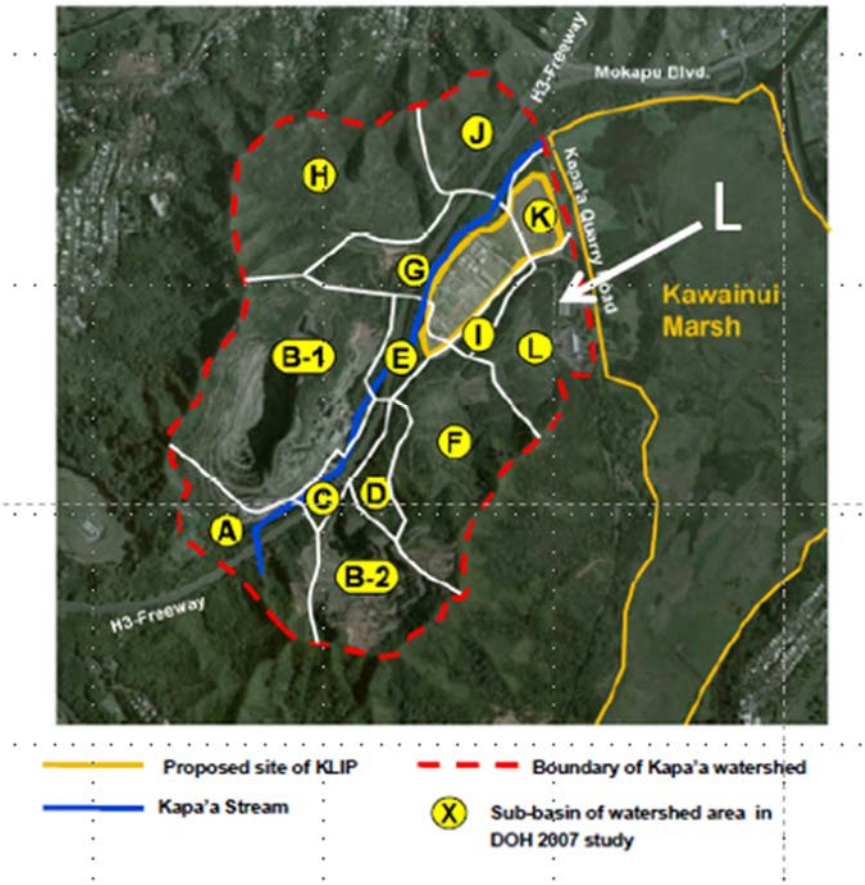


Figure 4.3.4.1: Schematic storm water management of the site at the time the 2011 FEIS was accepted.

The flow designated as (G) in Figure 4.3.4. 1 is defined as follows "The runoff in the vegetated swale along the Kapa'a Quarry Place enters a pipe conduit under the Kapa'a Quarry Place roadway and s flowthrough a 300-foot drainpipe, then discharged to a vegetated swale inside the Lower site, downstream of the drainpipe terminus. In the vegetated swale the runoff flows towards the Kapa'a Stream corridor". The flow (G) does not represent the runoff from the City Transfer Station. In fact, the transfer station drains to the Kawainui Marsh through a culvert underneath the Kapa' Quarry Road.

The figure below is from the 2011 FEIS with the annotation "L" added to indicate the subbasin L, where the transfer station is located.

Figure 3-12 Kapa'a Watershed with sub-basin definition for hydrological model



As was discussed before, the statement "*Instead Figure 6.2.3.13 in the SEIS shows that all waste and storm water from the lower landfill section* ***three*** *stand-alone containerized* ***wastewater*** *membrane bioreactor treatment plants and* ***three stormwater*** *drain outlets is directed into Kapa`a Stream, which runs into Kawainui Marsh and eventually into Kailua Bay*" does not describe the actual conditions at the site. There are no wastewater MBR treatment plants with outlets to the Kapa'a Stream. This observation does not portray the actual situation.

Response to the following text on page 3:

> Kapa`a Stream is a Class 2 Inland Stream. The objectives of Class 2 waters, as they apply to Kapa`a Stream, are to protect its uses for recreational purposes, the support and propagation of fish and other aquatic life, and agricultural and industrial water supplies. Uses to be protected include all uses compatible with the protection and propagation of fish, shellfish, and wildlife and with recreation in and on these waters. Existing uses include support of recreational activities, aesthetic values, and traditional and customary native Hawaiian beliefs, values, and practices. (§HAR11-54-3)
>
> In **2004** Kapa`a Stream was listed on Hawaii's 303(d) List of Impaired Waters under the Clean Water Act due to water quality being impaired by elevated turbidity, total suspended solids (TSS, nutrients (TN, TP) and metals. Kapa`a Stream flows into Kawainui Marsh and beyond to Oneawa Canal, Kailua Bay and the ocean.
>
> In 2004 Kapa`a landfill was placed on the State Priority list of sites eligible for possible listing under CERCLA? Was the landfill ever listed?

Response: In our research it was not placed in the list.

Response to the following text on page 4:

> In the FSEIS describe how the industrial park and businesses within the lower landfill section will ensure that stormwater leaving business sites and the industrial park meets water quality standards.

Response: Stormwater pollution prevention to meet the water quality standards at the KLIP follows applicable HAR 11-55 requirements or County storm water regulations.

Since all planned construction sites within the project site will disturb one or more acres of land, a NPDES NOI will be filed for all construction activities.

For post-construction NPDES, No Exposure certifications have been and will be obtained for the existing and future warehouses in KLIP. Tenants are obliged to follow to the requirements which are associated with the No exposure certification terms.

Response to the following text on page 4:

> To prevent continuous degradation and nutrient loading in Kapa`a Stream and ensure that water leaving the lower landfill section is as clean as possible as it migrates from Kapa`a Stream into Kawainui Marsh and eventually into Kailua Bay the City should require the industrial park to hook up to the City municipal sewer system before approving any construction on the lower landfill site.

Response: As was discussed earlier in this **Appendix B,** connecting the KNEI to the municipal sewer system is not possible since there is no sewer in the Kapa'a Valley. As was also discussed earlier in **Appendix B**, earlier investigations revealed that installing a pressurized sewer line to the next connecting point on Mokapu would not be reliable solution and would create more impacts than can be avoided.

Response to the following text on page 4:

The SEIS lacks specifics on what Best Management Practices (BMPs) will be used after construction and for the life of the industrial park. Without this information it is impossible to whether proposed BMPs will be adequate to prevent polluted stormwater from going into Kapa`a Stream. Included this information in the FSEIS.

Response: BMPs were list earlier in this **Appendix B**.

Response to the following text on page 4:

The FEIS was approved in 2011 and the applicant received the SMAP in 2014 yet no wastewater or drainage infrastructure has been installed in the lower landfill section. To prevent further changing of wastewater and drainage systems and topography of the lower landfill section approval of this SEIS should contain the requirement that stormwater and wastewater infrastructure must be put in before approval of any structures on the lower landfill section.

Response: This point was discussed earlier in this **Appendix B**. Installation of the storm water and wastewater system will be done during the construction.

Response to the following text on page 5:

The SEIS incorrectly refers to the ditch that runs alongside Kapa`a Quarry Road as *previous.* This is incorrect. The ditch still exists but is overgrown and unable to fulfill its designed function of filtering out pollutants from stormwater seeping from the landfill before going under Kapa`a Quarry Road into Kawainui Marsh. In the FSEIS change any reference to the ditch, as *previous* to existing.

Response: We agree and will change these words.

Response to the following text on page 5:

The approved 2011 FEIS states "Measures proposed include maximizing open space within their property with landscaping and a "green" landscape barrier around warehouses, improving management of stormwater runoff discharged from the site and using harvested rainwater from buildings to support irrigation of landscaping, which decreases discharges." (Pg. 7-9)

Response: Green landscape barriers, e.g., the proposed buffer zones, are still part of the design. **Appendix I of this Final SEIS** describes the development approaches of the buffer zone that were approved by DPP and DLNR. Rainwater catchment will still be part of the site development plan. The irrigation water will be used for the vegetated buffer zones, the vegetated buffer strips and the trees that are planted inside the site. Adding trees is a change from the Draft SEIS.

Response to the following text on page 5:

Under the SEIS all the green space and landscaped barriers around warehouses are gone with 27 acres of a pervious surface changed to impervious thus eliminating the ability to capture stormwater runoff and reuse the captured water for other purposes.

Response: The function of landscaped and vegetated buffer zone areas to capture storm water was not a design intent of the 2011-FEIS nor the current design intent. Harvesting rainwater for reuse needs to have roof areas from where the downspout discharge is disconnected and conveyed to storage vaults.

Response to the following text on page 5:

Pg. 183 SEIS "In the case of high peak flows rainwater cannot be percolated into pervious surfaces and be consumed by vegetation covers, so drainage flows from increasingly impervious surfaces. In general, areas that were converted to a higher imperviousness can cause higher peak flow rates. The Proposed Action would convert land from pervious to impervious surface and therefore would add adverse effect from high peak runoff rates if no mitigation measures were taken"

Response: The text correctly describes possible impacts of converting pervious to impervious land. We have correctly disclosed possible impacts. However, emphasis is placed on "if no mitigation measures were taken". But mitigation measures have been designed.

Response to the following text on page 5:

Pg 247 According to Table 6.2.5.1 the 3 drainage areas in lower site 100% will be impervious. (See attached ***Figures 6.7.1.2 and 6.7.1.3)***

- The proposed modifications in the SEIS increase impervious surface for the lower landfill section from the approved 2014 SMAP of 61% to SEIS proposed 74% which eliminates the much touted Low Impact Development (LID) techniques such as stormwater harvesting and reuse.
- In the FEIS explain why it is necessary to eliminate the touted Low Impact Development (LID) approaches.
- In the FSEIS identify the mitigation measures that will prevent adverse impacts to Kapa`a Stream from runoff that is not slowed and/or captured when green spaces are eliminated.
- In the FSEIS explain why it is necessary to increase pervious surfaces in the lower landfill section and eliminate almost all of the green space and the ability to capture water for reuse in an area that is adjacent to Kapa`a Stream and Kawainui Marsh.
- Accepting the SEIS is going backwards

Response: As was discussed earlier, the function of the pervious and landscaped areas around buildings inside the project site is not a LID strategy. As a LID strategy the "large, landscaped areas" would have to infiltrate large volumes of storm water which then would generate potential harmful leachate. This must be avoided. However, although the development occurs on a landfill, there are still LID strategies implemented. For example, the vegetated buffer strip upstream of the detention vaults in the Lower site is a LID strategy. The objective of the vegetated buffer strips is to filter our particulate matter and to absorb dissolve pollutants. In the Lower site the vegetated buffer strips will be built on the detention vaults, and therefore above impervious surfaces. Consequently, no significant infiltration will occur from the vegetated buffer strips in the Lower site.

Response to the following text on page 5:

Pg. 223 If specific **low impact development** (LID) strategies approved in the 2014 SMAP that were to be used to treat storm water and control flow events will no longer be used does this deletion negate the 2014 SMAP?

Response: In 2019 there was a major change in the County storm water rules. One of the rules was the requirement for LIDs. If the LIDs could not be implemented because of site specific reasons, such as avoidance to infiltrate the storm water at the site an alternative compliance path is available through manufactured treatment devices (MTD). Accordingly, since infiltration was not an option, the alternative compliance with a MTD was selected. The changing rules for storm water treatment was the reason why the Applicant had to change the storm water system from the strategies proposed and accepted in the 2011-FEIS. To be clear, the new and current storm water rules are more stringent than those which were in effect in 2011. And because more effective storm water systems are implemented, the impacts from storm water on the environment will be lower, not higher, under the storm water approach proposed under the 2020 SEIS.

Response to the following text on page 5:

The SEIS proposed wastewater system is a Membrane Bioreactor (MBR) treatment unit. According to the SEIS there will be three MBR units in the lower landfill section.

Response: In accordance to Figure 6.10.2.2 of the 2020 Draft SEIS there will be about six MBR systems in the Lower site under the proposed design approach.

Response to the following text on page 5:

In the FSEIS explain if the drain outlets shown in Figure 6.2.5.2 and Figure 6,2.5.4 are the same as the *treatment systems* and *stormwater outfall for drainage areas* as shown in Figure 6.2.3.13 and if the same systems will be used for storm and wastewater.

Response: All referenced figures show in the referenced figure are storm water system elements. Figure 6.2.3.13 is marked as pertaining to storm water. The term "treatment" in Figure 6.2.3.13 indicates the use of "treatment trains" for storm water. In our case the treatment train for storm water includes vegetative buffer strips, detention vaults and MTD unit. The wastewater effluent disposal occurs in an infiltration field, with the location of the infiltration filed illustrated in Figure 6.10.2.2 of the Draft SEIS. Figure 6.10.2.2 is shown below with annotations added.

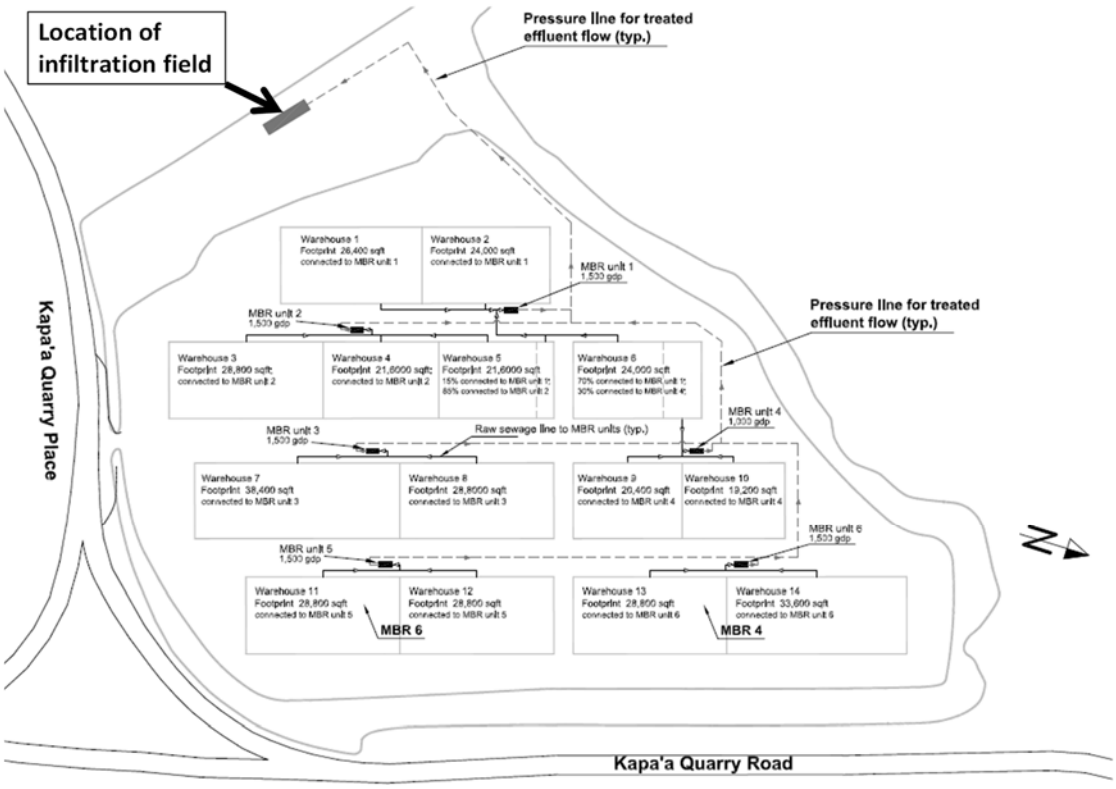


Figure 6.10.2.2: MBR system layout under the proposed design approach (source Draft SEIS)

Response to the following text on page 6:

The FEIS is silent on how far the pipes will extend over the riparian area of Kapa`a Stream. Placement is critical to prevent erosion and prevent large amounts of water from inundating Kapa`a Stream and its marine life. In the FSEIS include information on placement of the pipes shown in Figure 6.2.3.13 including how far they will extend into Kapa`a Stream riparian area

Response: The **Appendix I of this Final** SEIS describes the design concept of the outfalls for both the water quality discharges (the storm water leaving the MTD) and the overflow of the detention vaults.

Response to the following text on page 6:

In the FSEIS provide information on the anticipated amount of stormwater and wastewater expected to come from each of the six drainpipes (3 wastewater and 3 stormwater shown in Figure 6.2.3.13, Figure 6.2.5.2, Figure 6,2.5.4) per day and deposited into Kapa'a Stream during the dry season and during the wet season.

Response: As discussed earlier the outfalls shown in Figure 6.2.13.13 and the other two figures cited are not wastewater discharges. They are stormwater outfalls that discharge the water quality and the overflows. The estimate of the flow rates is delineated in **Appendix C of this Final SEIS**.

Response to the following text on page 6:

What State or City agencies, if any, will monitor and test the membrane bioreactor systems (MBR) to ensure that they are routinely and properly maintained and that the water flowing into Kapa`a Stream meets EPA water quality standards?

Response: The Applicant conducts monthly water samples and reports are sent to the Department of Health (DoH). There is no direct wastewater effluent flowing into the Kapa'a Stream. The effluent is disposed in the infiltration field.

Response to the following text on page 6:

Will the MBR systems be above ground or below ground? If below ground what is the required depth for each unit? If above ground what is the height of each unit?

Response: The existing two MBR units are installed below ground. The future MBR system will also be installed below ground.

Response to the following text on page 6:

In the FSEIS explain if the landfill is stable and deep enough to accommodate membrane bioreactor (MBR) systems without breaking the cover?

Response: The details of the installation of the MBRs is delineated in the Draft FEIS. The landfill is deep enough. It is not clear what is referred to as "without breaking the cover?".

Response to the following text on page 6:

What are the dimensions of each of the three MBR systems identified as (C), (D), and (E) shown in Figure 6.2.3.13?

Response: As discussed before the "treatment system" shown in Figure 6.2.3.13 are not MBR wastewater treatment units. The treatment systems refer to the storm water treatment trains. The treatment trains are described in **Appendix C of this Final SEIS**.

Response to the following text on page 6:

What is the height of each MBR if placed above ground?

Response: The generic design of the MBR process vessels is depicted in the Draft SEIS. The height of the MBR process vessel can change and is determined in the detail engineering phase.

Response to the following text on page 6:

The SDEIS is silent on the types of chemicals that will be used to achieve low phosphorus. concentrations in the effluent and to produce biosolids that are acceptable for disposal? The FSEIS must provide information on the types of chemicals that will be used in the MBR processes and provide information on whether they are safe for the marine life in Kapa`a Stream and Kawainui Marsh.

Response: No chemicals are used in the MBR process at this time. If chemicals were used, the Applicant would notify the DoH on their use.

Response to the following text on page 6:

Does an operator of a MBR system need special training or qualifications?

Response: Yes, the operator must be certified in accordance with HAR 11-61.

Response to the following text on page 6:

In the FSEIS describe the type(s) of debris removal processes that will be used in the MBR systems to remove debris before wastewater goes into the system?

Response: As described in the Draft SEIS, the raw wastewater enters the MBR system through the first stage process which is a settling tank. The clarified effluent from the first stages then enters the active process tank where the aeration takes places.

Response to the following text on page 6:

In the FSEIS explain how and where debris removed from the MBR process will be disposed?

Response: As described, the debris removed from the MBR system is the excess activated sludge and the raw sludge from the settling tank of the MBR. The sludge removed from the MBR will be disposed by a certified pumper in accordance with HAR 11-62.

Response to the following text on page 6:

In the FSEIS explain what chemicals, if any, will be used to process the waste sludge and whether the chemicals are safe for marine life?

Response: The Draft SEIS describes that the sludge will be regularly pumped by a certified pumper. The certified pumper must certify that the sludge is disposed in manner that is consistent with the HAR 11-62.

Response to the following text on page 6:

In the FSEIS explain how and where the sludge, treated with chemicals, from the MBR treatment systems will be disposed.

Response: As per contract between KLIP management and certified pumper, the certified pumper is responsible for the correct way of disposing the sludge.

Response to the following text on page 7:

In the FSEIS provide information on the porous nature of the MF/UF membranes used in MBR system that allows small organic compounds such as pesticides, pharmaceuticals, endocrine disturbing chemicals and/or disinfection by-products to permeate through the membrane and the possible impact on the water quality and marine life in Kapa`a Stream and Kawainui Marsh.

Response: The Draft SEIS describes the difference and similarity of conventional septic systems and the MBR treatment units. Both systems inject the wastewater effluent into the ground. The MBR units produce an effluent with about 25% and 3% of the residual dissolved and particulate matter.

The technology developer of the BioBarrier MBR system states that membrane has a nominal ultrafiltration pore size of 0.03 micron. Generally, this means physical separation of bacteria, many

types of virus, and other high molecular weight compounds. Therefore, some reduction of emerging pathogens and pollutants of concern is expected, but we cannot quantify specifically a typical reduction performance. There should certainly be less impact on stream quality as compared to alternative technologies. Performance regarding phosphorus removal is expected to be a 1 mg/L reduction below the influent concentration, as this is typically what the activated sludge process achieves through the bacteria metabolic uptake. Additional removal could be achieved by adding chemical that promote flocculation and therefore enhance precipitation of phosphorus. The formed particles by flocculation enhance physical removal performed by the membranes filtering out the resulting solids.

Response to the following text on page 7:

Settlement is a major geotechnical aspect of the restoration and development of a closed landfill. Municipal solid waste settlement will cause problems for after use development, such as severe distortion and damage to buildings, sagging surface channels and the ground resulting in water ponding, reversed flow of underground drain, cracking of surface paving causing infiltration of water into the municipal solid waste.

- In the FSEIS provide information on whether the landfill has been properly compressed.
- The SEIS is silent on how long the landfill will need to compress and settle after all the soil is placed on the landfill to reach the 50 feet before it is safe to be built on. This information must be in the FEIS.

Response: As was discussed earlier in this Appendix, there were two geotechnical investigations, one in 2012 and the other in 2019. The 2012 geotechnical investigation concluded that the landfill was 90% consolidated. The 2019-soil report described what efforts needed to be done when the new fill was brought to the site. We will add a reference to the 2012 geotechnical report in the Final SEIS. The figure below is from an internal report by SDC to the Applicant that describes the basic processes of settlement in landfills. The figure below shows a case of settlement behavior of a landfill with municipal solid waste (MSW). The case portrays a typical settlement behavior. In accordance with the figure a settlement equilibrium is reached after about 40 years.

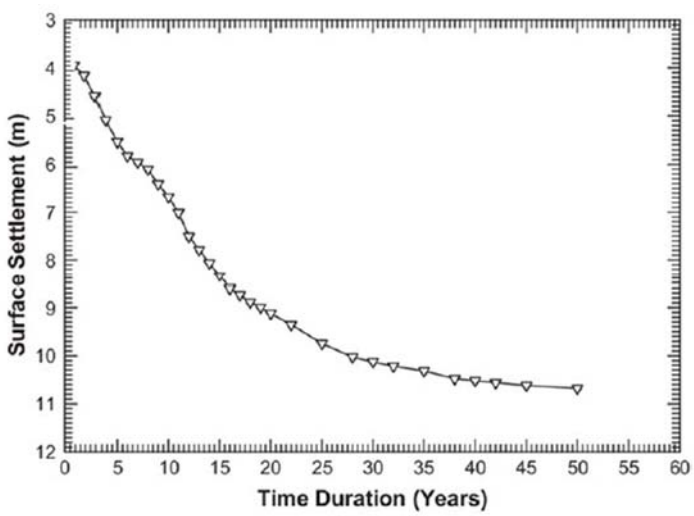


Figure 3.3.1: Typical settlment rate in MSW landfill after closure
Source (Internal report of SDC to the Applicant)

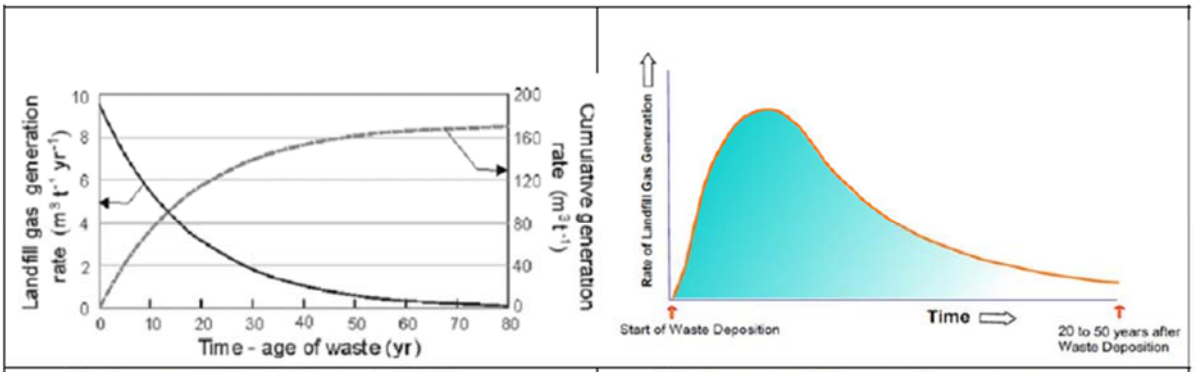
The settlement scale at the left indicates the amount of absulte settlment

Response to the following text on page 7:

Landfills are the third-largest source of human-related methane emissions. Uncontrolled biodegradation in a landfill can cause methane gas emissions, ground water pollution and unstable sub-soil conditions. Really old organic materials in a landfill slowly release methane as they anaerobically degrade.

Response: Typically, most of the methane is created in the earlier stages of the land fill. After a certain time, which is dependent on site-specific conditions, the methane generation is reduced to small values.

The figure below is from an internal report by SDC to the Applicant in 2019. The figure shows typical methane production in landfills which have significant amounts of organic waste.



(a) As reported by Lefebvre, R. (2004) | (b) As reported by www.inogate.org

Figure 3.3.2: MSW Landfill gas generation as a function of time

Response to the following text on page 7:

Before the lower landfill section is allowed to be covered with 390,000+ cubic yards of material, topped with 15 warehouses that are 40 feet tall and 27 acres of pervious surface converted to impervious surfaces and opened to the public it is imperative that City and state agencies first must ensure that 1) gas emissions will not build up and leak out under the weight and 2) that the landfill is solid enough to hold the weight without sliding, sinking or collapsing causing human safety and environmental problems. According to landfill experts when building on a landfill, it is imperative to consider consolidation-time-settlement relationships and load bearing capacities developed from field and laboratory data. Information on this subject is missing from the SEIS. It must be provided in the FSEIS.

Response: The 2012 geotechnical report concluded that the landfill base was stable and was able to support the projected weight of final fill. The 2019 geotechnical report delineated the expected long-term settlement as less than 4 – 6 inches to little or no settlement, depending on the location of the filled area. The 2019 geotechnical report prescribed the process of adding fill to achieve satisfactory compression and slope stability. Both geotechnical reports did not report any presence of methane. We will add reference to the geotechnical reports in the Finals SEIS.

Response to the following text on page 7:

When waste is placed in landfills, over time the waste decomposes and sweats. This liquid, leachate, is hazardous, a known health risk and must be collected for disposal. Leachate can escape the landfill and contaminate ground and surface waters.

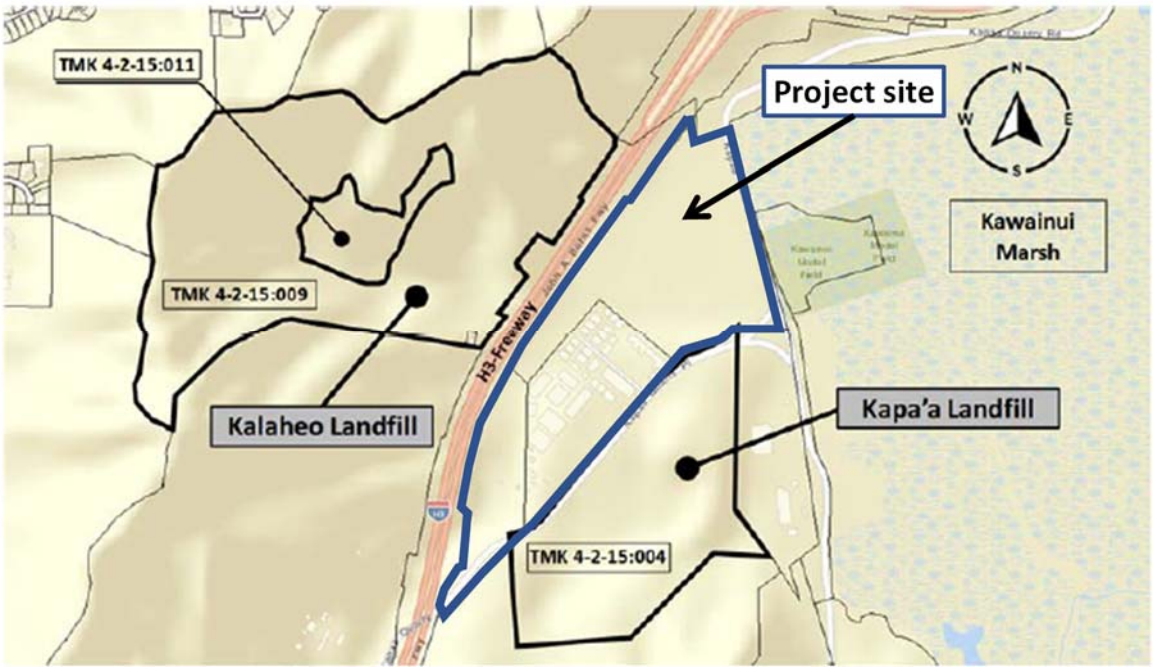
- In the years since the landfill was closed has leachate been collected from the landfill? If so, in the FSEIS provide information on when and how much leachate was collected and where, how, and where it was disposed.
- Has the Kapa`a Stream, water in the ditch along Kapa`a Quarry Road and water in Kawainui Marsh been tested for hazardous constituents that could have seeped from the landfill?
- Since the landfill has only been closed for approximately 23 years is leachate collection on going?

Response: According to our information, the landfill at the project was created before the installation of lines and leachate management become the norm and a requirement. No leachate has been collected.

To our knowledge, the City and County, who maintains the drainage ditch, has not tested the water in the ditch. In the past several years, our own observation of the drainage ditch was that no free water was detected in the ditch.

We conclude that the mentioning of the <u>23 years since closure</u> must address the Kapa'a landfill in the area. The landfill that forms the project site has been closed more than 40 years ago.

The figure below is from a 2019 internal report from SDC to the Applicant describing the landfills that are adjacent to the project site. There are two landfills near the project site, The Kapa'a Landfill, in TMK 4-2-15:004 and the Kalaheo Landfill, in TMK 4-2-15:009 and 011.



The text and figures below are from the 2019 internal report from SDC to the Applicant. We conclude the "23-year since closure" landfill referred in the comment is the Kapa'a landfill whose Site No. 2 was closed on 1997. Thus, the reference to 23 years.

Below is an excerpt text (in italic) quoted from the 2019 internal report from SDC to the Applicant

6.1 Kapa'a Landfill Area and the Project Site in TMK 4-2-15:004

Figure 6.1.1 shows an image from the year 1986 that depicts the location and extent of the Kapa'a landfill. The red outline of the outer boundary of the landfill was added to highlight the extent of the landfill. Figure 6.1.2 shows that the Kapa'a landfill is separated into three sites, The Central site, Site No. 2, and Site No. 3.

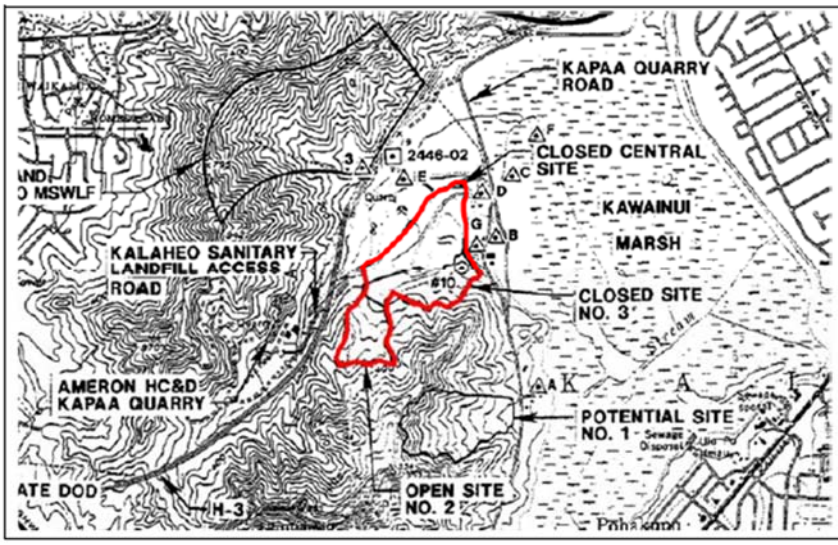


Figure 6.1.1: Depiction of Kapa'a landfill with outer boundary indicated.

The three sites of the Kapa'a landfill are described a follow:

Central site: The central Site began operation in 1970 and stopped receiving waste in 1979. The site does not have a leachate collection system with an under-drain system. In 1979 a three-foot soil cover was placed over the landfill and vegetation was planted.

Site No. 3: The Site No. 3 began operation in 1979 and stopped receiving waste in 1982, when it reached capacity. Site No. 3 has a leachate management system. The site has storm water management system consisting of a siltation basin and a discharge to the adjacent receiving waters. A perimeter drainage prevents off-site surface water from entering the landfill area. On-site storm water is directed to and conveyed in the perimeter drainage system. In 1982 a three-foot soil cover was placed over the ground vegetation was added. In 1991 the drainage system was improved.

Site No. 2: The Site No. 2 began operation in 1982 and ***stopped receiving waste in 1997****, when it reached capacity. Site No. 2 has a leachate collection and management system, which drains to manholes. The*

storm water system includes a desilting basin and a drainage to the adjacent receiving water. On-site storm water is directed to and conveyed in the perimeter drainage system.

Response to the following text on page 8:

It is common knowledge that landfills can continue to produce gases for more than 50 years. Kapa`a landfill was closed about 23 years ago.

For the safety and health of the public and the environment it is important that the FSEIS contain information on if and when methane was discovered in Kapa`a landfill how it was handled.

In the FSEIS provide information on whether methane gas still exists in the landfill.

In the FSEIS explain if methane gas was encountered during the soil survey and/or has been inadvertently discovered during other activities. If methane gas has been discovered explain how it was treated.

Hawai`i Administrative Rules Title 11 Chapter 58.1 Solid Waste Management Control §11-58.1-11 are in place to ***ensure the protection of human health and the environment.***

"Post-closure" as defined in this section means ***the requirements placed upon landfill disposal sites after closure to ensure their environmental safety for a thirty-year period.***

Kapa`a landfill has been closed about 23 years. It is assumed that the City and County and State Department of Health are following the closure plan. The question is once buildings, storm and wastewater infrastructure are placed on or within the landfill who is responsible for following the closure plan and protecting human health and the environment.

The FSEIS must identify the party(ies) who will be responsible for following the plan and protecting the public and environment over the remaining years.

§11-58.17-17 Municipal solid waste landfills – closure and post-closure care (a) calls for a final cover system to be designed and installed when a landfill is closed. We assume that a cover, which minimizes infiltration, was installed when the landfill was closed.

In the FEIS describe the type of cover system that was placed over the landfill.

In the FSEIS provide information on the human health and environmental consequences if a proposed MBR system placed under ground penetrates the cover allowing infiltration and erosion.

Response: As discussed earlier, the landfill which was closed 23 years ago is not the landfill that supports the project site. The landfill at the project site was closed an estimated more than 40 years ago. Our research has not revealed any post-closure plan. The requirement for owners and operators of landfills to provide a written post-closure plan, that complies with 40 CFR 265.118, became effective in 1981. This means after the landfill operations at the project site were completed before post-closure plans became mandatory.

Response to the following text on page 8:

> The SEIS states that "The proposed warehouses are *relatively light structures that could use shallow foundations*, such as raft foundations" but "If found to be necessary, *some form of deep foundation might be considered* for selected buildings though deep foundations using piles are not anticipated to be extensively used for the proposed site, if at all."
> Did the soil survey reveal the load bearing capacity of the landfill and the ability of the material in the landfill to support pilings for buildings?

Response: The 2019 soil study was conducted for a grading permit inside the Lower site. The geo-engineering study provided guidance on the process the mass grading has to be carried out to stabilize the landfill. It was pointed out in the soil study that local load bearing of future building foundation must be assessed before the actual start of the project .

Response to the following text on page 9:

> The SEIS states that "The soil bearing capacity within the Lower portion of the proposed site and the most suitable type of foundation will be determined before construction of the structures begins."
> - The SEIS does not provide information on the weight of each of the 15 structures or the total weight of the soil rocks etc. that will be brought in to reach 50 additional feet. So how it is possible to determine that the landfill can safely hold the additional weight.
> - Waiting until after permits have been given and construction is about to begin to determine the soil bearing capacity is to late.
> - The SEIS says that a soil survey was conducted so why isn't the soil bearing capacity of the lower portion known and included in the SEIS?

Response: As stated earlier the 2019 soil report was conducted to provide guidance on the mass grading process. This included the guidance to compact the fill and to stabilize the perimeter berms. We will include a summary of the 100-page 2019 soil report pertinent findings in the Final SEIS.

Response to the following text on page 9:

> Pg 131 "The landfill operation was discontinued more than 40 years ago, and therefore the landfill should have reached a degree of stability that is necessary to substantially mitigate the engineering and health and safety concerns associated with waste degradation."
>
> This is an incorrect statement. Kapa`a Landfill was closed in 1997, which is only 23 years ago.
>
> In the FSEIS describe *degree of stability?*

Response: As discussed earlier, the comment refers to the Kapa'a landfill in TMK 4-2-15:004. The site No. 2 of the Kapa'a landfill was the last of the threes landfill sections to close. Site No. 2 closed in 1997. Therefore, the inference of the comment of "incorrect statement" is there not correct.

Response to the following text on page 9:

In the FSEIS provide information on whether the City has installed a gas collection and control system for the Kapa`a landfill presently the site of Kapa'a Industrial Park. If so, explain how much methane gas has been extracted and if methane gas extraction is ongoing.

Response: The City has not installed a gas collection and control system at the project site. To our knowledge the City has installed a gas collection and control system at the Kapa'a landfill in TMK 4-2-15:004, as part of the post-closure pan. The Kapa'a landfill in TMK 4-2-15:004 was closed in 1997.

Response to the following text on page 9:

The SEIS is silent on how many tons of soil, rock, topsoil, rap, asphalt etc. will be brought in to cover the lower landfill to reach the requested 40 to 50 feet. This information must be in the FSEIS. What is the soil compaction requirement after all soil etc. has been brought onto the lower landfill section before the landfill is safe to build on? The SEIS is silent on the cumulative effect of piling 40 to 50 additional feet of rock, soil etc. on top of the landfill. How much will the additional weight compress the existing solid waste in the landfill? Is there a time limit between closure of the landfill and the ability to safely construct buildings?

Response: The above comments use two different reference to site elevation, (1) absolute elevation "to reach the requested 40 to 50 feet ", and (2) additional elevation "effect of piling 40 to 50 additional feet of rock, soil etc. on top of the landfill".

The response to this question is repeated below.

*The <u>finish grade elevations will between 40 and 50 feet</u>. Using the finish grade as indicated the **average increase over the existing grade is 15 feet**. The increase of finish grade over the existing grade varies over the entire site. <u>The figure below</u> illustrates the distribution of the height of the fill that must be added to the existing grade. The results depicted in Figure 15 were obtained by a grid model that was developed for the project site. The results of the grid model indicate the amount of net fill to be approximately 450,000 cubic yards (cby).*

									7	18	22														
							-2	6	13	16	19														
					3	7	10	10	11	13	15	17													
					11	7	7	8	9	12	12	13	16	20											
					6	-2	1	8	9	11	11	12	13	16	19										
-3	-2	0	1	1	6	3	6	10	10	11	11	12	14	16	18										
-7	-5	-2	3	7	10	11	12	13	13	14	14	14	16	17	18	18	19	24							
-8	-3	0	5	9	11	13	13	14	16	16	17	17	17	18	18	18	18	21	25						
-6	-2	2	7	9	11	13	14	15	16	16	16	17	18	18	18	18	18	18	22	25					
-4	-2	2	7	8	10	12	14	15	16	16	16	17	17	18	18	18	17	17	18	22					
-3	-2	3	8	10	11	12	13	14	15	16	17	17	16	17	18	18	17	16	16	18	22				
-1	1	6	10	12	13	13	14	15	16	17	17	17	17	18	19	18	17	17	17	19	21				
3	6	9	11	13	14	14	15	16	16	15	15	16	18	19	19	19	18	18	19	19	19	21			
5	7	10	13	14	15	16	16	17	16	13	12	14	18	20	20	20	20	19	19	18	18	19	21	22	24
6	6	10	14	15	16	16	17	18	17	14	13	14	17	20	20	20	20	20	19	19	19	19	21	22	23
11	10	12	15	17	17	17	17	18	17	15	15	15	18	21	21	21	21	21	21	21	20	19	20	22	24
	16	17	16	16	18	18	18	19	18	17	17	18	20	22	22	22	22	22	23	23	21	20	20	22	25
		21	20	18	19	20	21	22	22	22	22	22	23	23	24	24	24	24	24	24	23	23	22	22	24
				22	22	22	24	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	23	24

Red cells inidcate Cut **Blue cells inidcate Fill**

Figure 15: Increases of finish grade over existing grade – based on Grid model

The net weight of the 450,000 cby is approximate 490,000 tons.

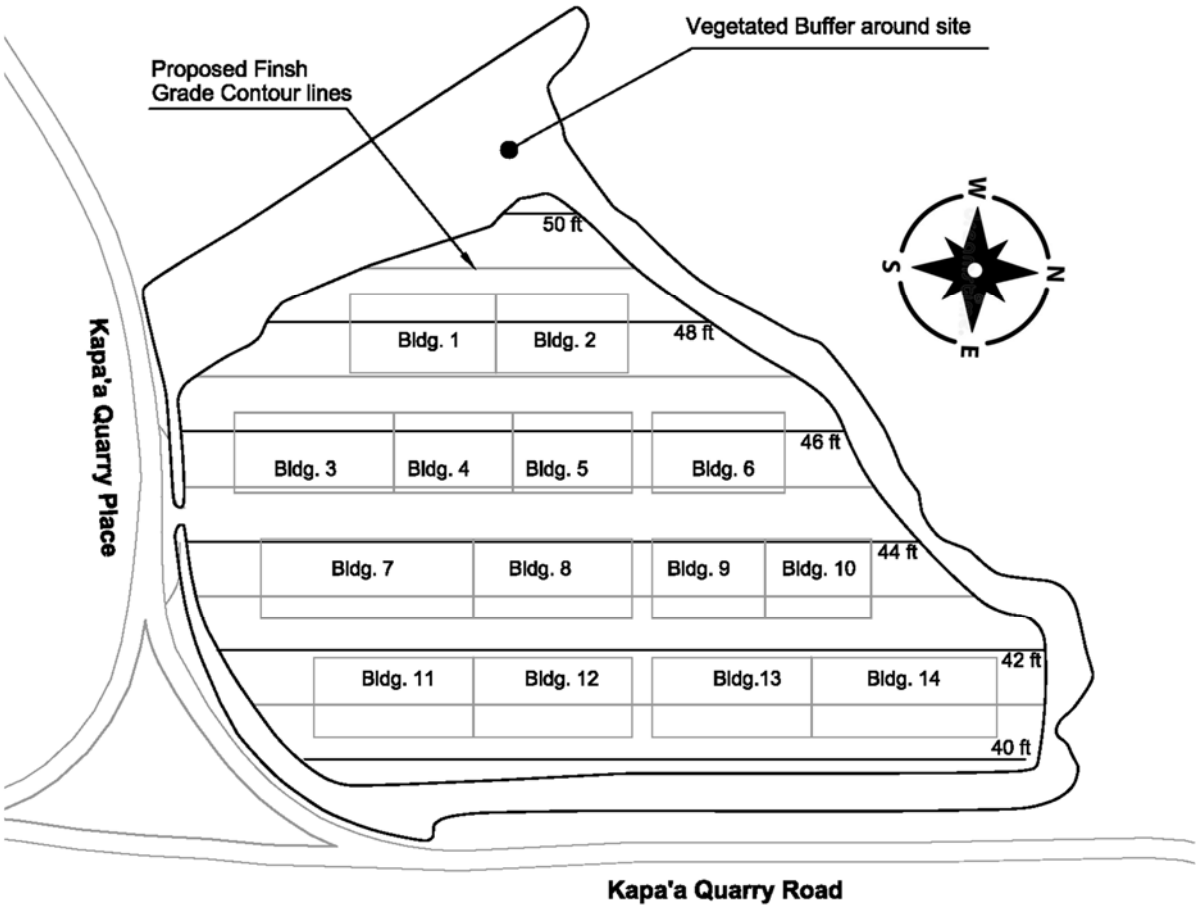
Response to the following text on page 10:

> It is our understanding that the applicant has approval to raise the finished grade from 25 to 39 feet. So why is the increase to 50 feet necessary? As far as visual pollution and impacts on migratory birds any increase in grade is bad enough.
> If 40+ feet is added to the topside of the lower landfill section it will about the same height as the middle section of the industrial park noted by the circle next to Nikola's Auto Center, which is 85 feet. Increasing the height by 40 feet makes it convenient to create a contiguous paved area from the mauka end of the industrial park to the makai end next to Kapa`a Quarry Road except the green in between Nikola's Auto Center and the parked cars is a stream.
> Adding 40 to 50 feet to the lower 26 and 27 feet and placing 40-foot-tall warehouses on top of the approximately 77 feet will create a 117-foot-high barrier that will make all the warehouses visible from almost anywhere in Kailua. Presently the City's transfer station and lights from the industrial park are seen over the flat Kawainui Marsh.

Response: It is important to point out that only one measure of finish grade elevations should be used. In the comments the actual elevation and the "added" elevations are mixed.

The figure below shows the absolute elevations of the full build-out finish grade.

The reason for the increased finish grade is the elevation needed to provide the hydraulic flow energy for the storm water system in the Lower site. There must be a certain elevation difference between the start of the main drainpipe and the lowest discharge point of the storm water system. **Appendix D of this Final SEIS** describes the reason behind the selected finish grade.



While the I-1 zoning of the Lower site allows a building height of 40 feet, the typical height of warehouses built so far is 35 feet. Adding this 35 feet to the average elevation of buildings 1 and 2 (as shown in the above figure) would give a height of 83 feet, not 117 feet.

The visual impacts and effective measures to lower visual impacts from near- and long-distance viewpoints to the project site are discussed in **Appendix G of this Final SEIS**.

Response to the following text on page 10:

SEIS Pg. 347 "...the Proposed Action would cause irreversible and irretrievable changes in near and distant views from view planes around Kawainui Marsh, Kailua town, H3-Freeway and roads adjacent to the property site. The proposed visual impact mitigation, such as the vegetative buffer zones around the site perimeter along the Kapa`a Quarry Road would significantly reduce the intensity of the visual impact from view planes on the adjacent roads and around Kawainui Marsh."

This is a correct statement. Once the land is raised another 40 to 50 feet to the interior 34 feet there is no hiding the 40 feet tall buildings or the lights on and from the buildings.

A berm that is 2 feet higher than the ***full build out interior site*** will not hide anything.

There are no mitigation measures that can negate the negative visual impact of the 117 foot high barrier along Kapa`a Quarry Road. Have soil studies been conducted to ensure that increasing the height 77+ feet along Kapa`a Quarry Road and adding 40 feet tall buildings will be safe for drivers along the road?

Have studies been conducted that evaluate the continual flooding of Kapa`a Quarry Road and impacts from the increased height such as erosion to the hillside?

Raising the higher end of the lower section another 40 feet on top of the 43 feet = 83 feet. Add 40 feet tall buildings on top of that and nothing is hidden.

If the interior of the lower section is raised 40 feet added to the present 34 feet = 74 feet. Add 40 feet to the lower section 27 feet along Kapa`a Quarry Road = 67 feet. The dimensions of the earthen berm are not given so it is impossible to calculate the height the berm, on top of the 67 feet along Kapa`a Quarry Road, would have to be to provide any visual relief.

Not only will the buildings be visible during the day from many areas in Kailua but the night lights could be a deadly for migratory birds that fly mauka to makai over the dark Kawainui Marsh and through the relatively dark Kapa`a Valley.

The SEIS is silent on impacts to migratory birds from lights in parking areas needed for safety and on buildings that are approximately 117 feet in the sky.

Kawainui Marsh is habitat for four endangered water birds and a stopping off place for migratory birds so the FSEIS must contain meaningful and attainable mitigation measures to help ensure that migratory and endangered bird species are not harmed or killed.

Response: Again, the comments mix absolute heights and heights added. Therefore, the convention of using absolute elevations should be taken to express finish grade.

The comment addresses three key aspects of impact mitigation strategies, which are discussed in detail in three Appendixes.

- Visual impact mitigation strategies, an internal report (**described in Appendix G of this Final SEIS).**

- Buffer zone development: a submittal to DLNR (**described in Appendix I of this Final SEIS**).
- Light pollution prevention: a submittal to DLNR (**described in Appendix H of this Final SEIS**).

The three appendixes describe effective strategies to lower the visual impact and light pollution. The **Appendix I** furthermore describes an accepted concept of how to develop the vegetated buffer zones at the site perimeter.

Response to the following text on page 10:

Were studies conducted to see and understand the impacts to Kapa`a Stream from increasing the existing height from 30+ and 40+ feet to 70+ to 80+ feet in the area adjacent to the stream? The FSEIS must provide information on how the increased height will impact Kapa`a Stream and how adding layers of dirt will not cause erosion into the stream.

Response: **Appendix D of this Final SEIS** describes the elevation requirements to discharge storm water over a distance of up to 1,200 feet, from the Southern site through the Lower site to the Northern site perimeter and overcome the hydraulic losses of the treatment train. In the figure below, the Figure 5.3 of **Appendix D**, the finish grade is shown in relationship with the existing grade and the hydraulic energy line of the stormwater discharge. Figure 5.3 used the example of the drainpipe No.3 for this representative cross section. In the cross section of Figure 5.3 the difference between the finish grade and the existing grade I the Kapa'a Stream corridor is 20 feet.

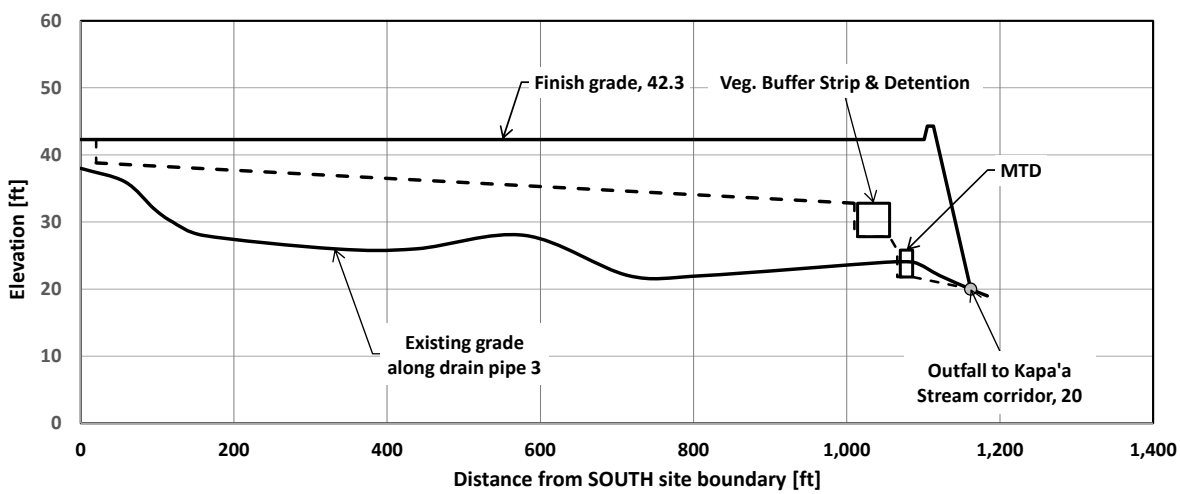


Figure 5.3: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 3

The below figures show different Images from the **Appendixes C and D of this Final SEIS**. Figure 7.2 of **Appendix D** shows the elevations of the site inside the perimeter berms and the foot of the berms at the Northern site perimeter; along a station line which starts on the perimeter berm close at the Kapa'a Quarry Road and extending towards the Western site perimeter.

It must be noted that per request by DPP, the numbers of drain areas and treatment trains, including the MTD units, have increased from three to four. This change was made to increase the effectiveness of the storm water treatment and management. As indicated in Figure 7.2 of **Appendix C** the elevation differences between the finish grade of the Lower site and the exiting grade in the Kapa'a Stream corridor range between 22 and 24 feet. Figure 7.3 of Appendix C shows the station line referred to in Figure 7.2.

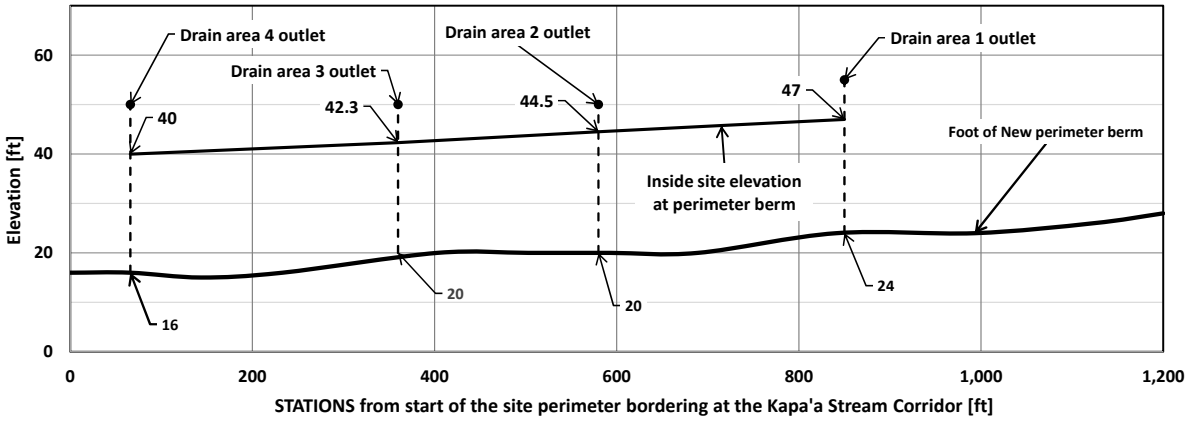


Figure 7.2: Elevations of the site inside the perimeter berms and the foot of the berms at the Northern site perimeter

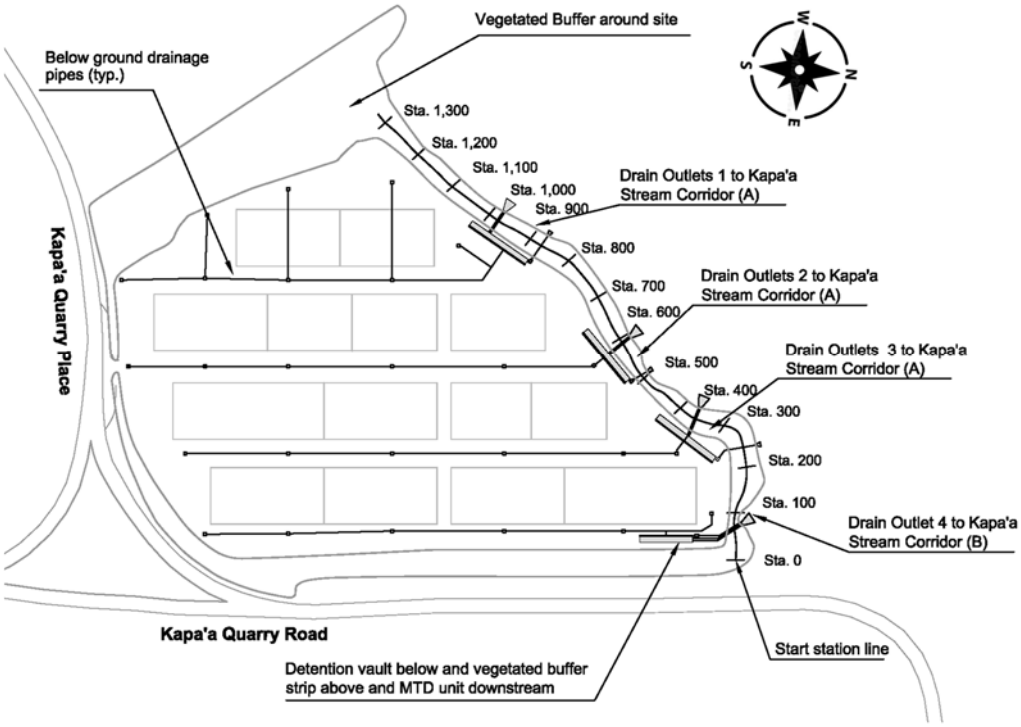


Figure 7.3: Elements of the storm water drainage and treatment system of the Lower site

Figure 7.4 of Appendix C shows a representative cross section of a site perimeter berm. Figure 7.4 shows the invert of the water quality (WQ) pipe. The WQ pipes discharges the effluent from the MTD units to the Kapa'a Stream corridor.

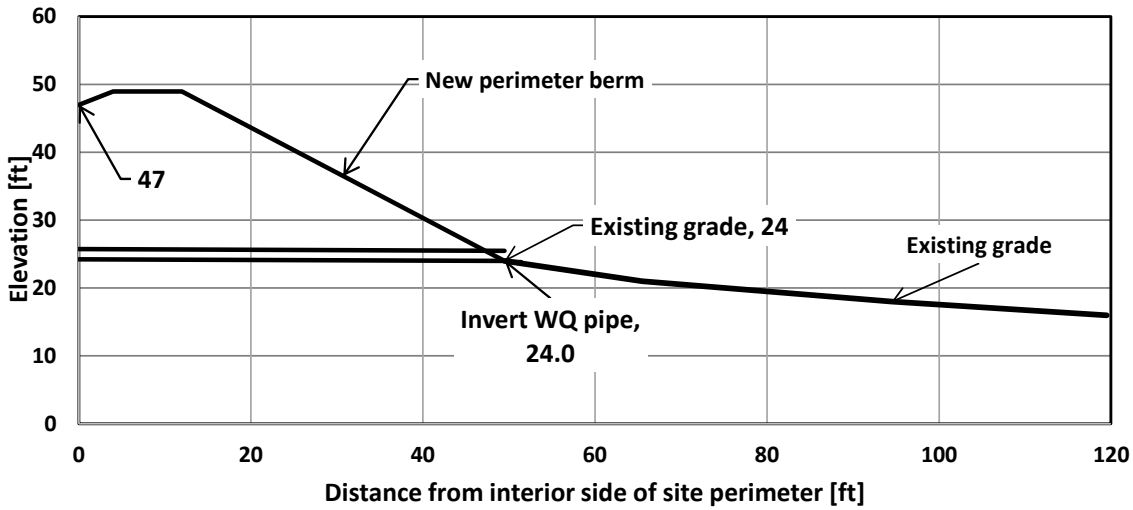


Figure 7.4: Cross section through the New Northern site perimeter berm at the location of the outlet for drainage area 1

Response to the following text on page 10:

> Noise barriers pg 345 "long term noise during operations could be mitigated through several measures that include orienting large warehouse doors away from the marsh, installing noise barriers to shield adjacent areas that are most sensitive, housing noisy equipment indoors or under noise attenuating containments and avoiding unnecessary idling of heavy trucks."
>
> The industrial park just provides spaces for businesses so it is not their obligation to ensure that noisy equipment is indoors, that doors to do open toward Kawainui Marsh and the ocean to get trade winds or police heavy trucks to prevent idling noise. So unless there are some unknown rules and or the city will police undesirable and unhealthy actions if approved there is not much that can be done about these issues.
>
> The industrial park could install some sort of noise containment but nothing was identified in the SEIS. If there are structures or techniques that could be installed to contain noise they should be in the FSEIS.

Response: The buffer zone will provide some degree of noise impact mitigation. The expected major noise impact will be through traffic. There are two site development strategies that will help to mitigate noise impacts. First is the new traffic flow pattern. The new road entrance to the Lower site, as proposed in the 20202 SEIS, is about 250 feet moved towards the West as was proposed in previous plans, away from the marsh. A steep ramp at the Eastern site perimeter, which was proposed in earlier site development plans, was removed in the 2020 SEIS. Therefore, the noise of large trucks driving up

the ramp will be avoided. Second, the Lower site will be under a NPDES No Exposure Certification. This will help to mitigate loud noises indirectly. The permit requirements for the No Exposure Exemption certification state that basically no work processes can be conducted outdoors, where rainwater could impinge on equipment. This means most of the activities in the KLIP must be conducted indoors and machinery equipment that is located outdoors must be covered with a protective shield. The Applicant has the design decision on where to place equipment and how to shield it.

Response to the following text on page 10:

> There is no comprehensive topographic map of the lower landfill section in the SEIS. Figures 6.3.2 and 6.3.2 titled *topographic of the project site* and *Lower site with grading recorded in 2017* just show wavy lines without any depth, width or height calculations.
>
> Three topographic maps of the lower landfill section must be included in the FSEIS.
> - One map showing the depth, width and height at the time the landfill closed in 1997.
> - Two topographic maps, one for 2017 and one for 2019 showing depth, width and height for the lower landfill section.

Response: The existing grade map is shown in the Draft SEIS and **Appendices C and D**. A topographic map of 1997 is not available.

Response to the following text on page 10:

> There is no comprehensive topographic map of the lower landfill section in the SEIS. Figures 6.3.2 and 6.3.2 titled *topographic of the project site* and *Lower site with grading recorded in 2017* just show wavy lines without any depth, width or height calculations.
>
> Three topographic maps of the lower landfill section must be included in the FSEIS.
> - One map showing the depth, width and height at the time the landfill closed in 1997.
> - Two topographic maps, one for 2017 and one for 2019 showing depth, width and height for the lower landfill section.

Response:

In the Final SEIS we will insert a 2017- recorded topographic map with height elevation information. A topographic map of 1997 is not available currently. The last topographic survey was in 2017, it was conducted for a grading permit under which some grading has been performed at the site. No later topographic map is available.

Response to the following text on page 11:

The SEIS does not provide any information on if the soil, sand, rap and asphalt shown in attached photos titled ***Kapaa ind park elevation 2019*** and ***Kapaa industrial park 8/2014.*** In the FSEIS provide information on how much fill has been brought onto the lower site for at least the past five years and if the soil, rap, rocks, etc. ware tested for contaminants before brought onto the landfill site
The FSEIS must explain if the fill that has been brought in has been compacted and to what degree.

Response: Over the past five years, grading has occurred in the Lower site under several grading permits. With information furnished by the Applicant and based on volume obtained from information of the active and closed grading permits, it is estimated that about 70,000 cby have been brought to the site. All fill that was brought to the Lower site had to have lab testing protocols.

Response to the following text on page 12:

The SEIS does not mention that Kapa`a Quarry Road and the lower section of the industrial park are within the City and County defined Extreme Tsunami Evacuation Zone. There is no discussion on evacuation plans since a tsunami would overtake the lower section of the industrial park and the only escape route Kapa`a Quarry road. (Attached titled ***tsunami Kapaa C&C map 2015***)

Response: Under the proposed finish grade of the Lower site, the entire KLIP will be elevated above the evacuation limit. The Applicant will advise tenants on the need to stay vigilant if a tsunami watch/ warning would be given.

Response to the following text on page 12:

Pg 253 "...mean monthly rainfall intensity was taken from the Rain Atlas of Hawaii and combined with the recoded mean days with rainfall in the Kailua Area" In the FSEIS identify the sites in Kailua where the rain data used in this SEIS was collected.

Response: The rain data for the project site was used from the Rainfall Atlas of Hawaii. In accordance with the Rainfall Atlas analysis approach, the following rain gauges were used in the spatial analysis of rainfall data:

"Hawaii Youth" at Kalanianaole Hwy., "Kailua Fire Station" at Kailua Road, and "Kailua" at Palapu St. The rainfall interpolates between data points, mean rain gauges . This information is readily available.

COMMENTS BY CITY DEPARTMENT OF DESIGN AND CONSTRUCTION

The following comments were received from the City Department of Design and Construction.

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

MARK YONAMINE, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

December 31, 2020

SENT VIA EMAIL

Mr. Manfred Zapka
sustainableDC@gmail.com

Dear Mr. Zapka,

Subject: Kapa'a Draft SEIS Comments

Thank you for the opportunity to review and comment. The Department of Design and Construction has no comments at this time.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

FOR Mark Yonamine, P.E.
Director

MY:ms(833565)

Response: We acknowledge receipt of your comments.

COMMENTS BY CITY DEPARTMENT OF TRANSPORTATION SERVICES

The following comments were received from the City Department of Transportation Services.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • web: www.honolulu.gov

RICK BLANGIARDI
MAYOR

J. ROGER MORTON
DIRECTOR DESIGNATE

JON Y. NOUCHI
DEPUTY DIRECTOR

TP11/20-833651

February 11, 2021

Mr. Manfred Zapka, Project Manager
Sustainable Design & Consulting, LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

SUBJECT: Draft Supplemental Environmental Impact Statement Kapaa Light Industrial Park - Kailua
Tax Map Keys 4-2-015:013 and 014

Thank you for the opportunity to provide written comments regarding the subject project. We have the following comments.

1. **Traffic Management Plan (TMP).** The Draft Supplemental Environmental Impact Statement (EIS) should include a Traffic Management Plan, which discusses traffic impacts the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding specific measures to mitigate these impacts by applying Complete Streets principles.

2. **Street Usage Permit.** A street usage permit from the Department of Transportation Services should be obtained for any construction-related work that may require the temporary closure of any traffic lane or pedestrian mall on a City street.

3. **Consistency.** When referring to the roadway with entrances to the site, you interchangeably use "Kapaa Quarry Access Rd" and "Kapaa Quarry Pl", sometimes using both designations in the same table or figure. Understanding that the name was changed, use the new name consistently.

Mr. Manfred Zapka, Project Manager
February 11, 2021
Page 2

4. **Neighborhood Impacts**. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

5. **Disability and Communication Access Board (DCAB)**. Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Scott Brady, of my staff, at 768-6693.

Very truly yours,

J. Roger Morton
Director Designate

Response: We acknowledge receipt of your comments.

COMMENTS BY STATE DOH CLEAN AIR BRANCH

The following comments were received from the State DoH Clean Air Branch.

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

April 1, 2019

Response: We acknowledge receipt of your comments.

COMMENTS BY STATE DOH WASTEWATER BRANCH

The following comments were received from the State DoH Wastewater Branch.

DAVID Y. IGE
GOVERNOR OF HAWAII

ELIZABETH A. CHAR, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:

LUD – 1 4 2 015 013 & 014 Draft
Sup Env Imp Stmnt ID 5419

December 15, 2020

Mr. Manfred Zapka, Ph.D., P.E., Principal
Sustainable Design & Consulting LLC
P.o. Box 25914
Honolulu, Hawaii 96825
Email: sustainabledc@gmail.com

Dear Mr. Zapka:

Subject: Draft Supplemental Environmental Impact Statement (DSEIS)
Kapaa Light Industrial Park – Kailua (907 Kalanianaole Hwy, Kailua 96734)
TMK (1) 4-2-015: 013 & 014

Thank you for allowing us the opportunity to provide comments for the subject project. Our records indicate that there are nine (9) existing individual wastewater systems that have been approved for use for the subject property. Any proposed expansion plans for the subject properties will require the installation of a wastewater treatment plant to handle the wastewater that will be generated from the new development. In addition, the wastewater plans shall conform to applicable requirements of Hawaii Administrative Rules, Chapter 11-62, "Wastewater Systems."

Please be informed that the proposed wastewater systems for the development may have to include design considerations to address any effects associated with the construction of and/or discharges from the wastewater systems to any public trust, Native Hawaiian resources or the exercise of traditional cultural practices.

Should you have any questions, please call Mr. Mark Tomomitsu of my staff at 586-4294.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

Response: We acknowledge receipt of your comments.

Appendix C:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

DESIGN CHANGES TO THE STORMWATER SYSTEM (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final SEIS

Appendix C

Changes and Additions made to the Stormwater Treatment and Management System of the Project Site

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

BMP	Best Management Practices
LID	Low Impact Development
MTD	Manufactured Stormwater Treatment Device
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System (EPA)
WQ	Water Quality
USFWS	US Fish and Wildlife Service
Lower site	Lower portion of the project site in TMK 4-2-15:014
Upper site	Upper portion of the project site in TMKs 4-2-15:013 and 014

EXECUTIVE SUMMARY:

Following the review of the Draft SEIS and the receipt of stakeholder comments, the following changes and additions have been made to the description of the stormwater treatment and management system of the project site:

In Section 1 the storm water treatment approaches of the entire site are discussed. The storm water treatment within the Upper portion of the site (Upper site) uses four different types of treatment systems. These systems serve a group or individual buildings within the Upper site. This means that runoff from two drainage areas might be connected to more than one storm water treatment system. Three of the four treatment systems in the Upper site incorporate LID technologies, which use land features at the site perimeter. The storm water treatment within the Lower site uses one treatment system approach for all four drainage areas. The treatment system in the Lower site uses LID features upstream of a MTD unit.

Section 2 discusses the efficacy of storm water treatment technologies used at the site. The expected level of pollutant removal and impact mitigation from the runoff is discussed.

Section 3 shows the drainage areas within the Lower site. The number of drainage areas has been increased from three to four drainage areas. This was done to lower impacts to the Kapa'a Stream corridor by more evenly distributing the discharge of the treated stormwater along the Northern site perimeter bordering the stream corridor.

Section 4 shows the Pre-construction conditions of the storm water runoff from the four drainage areas within the Lower site.

Section 5 presents the Post-construction amount of runoff from the four drainage areas within the Lower site.

Section 6 illustrates the runoff flow patterns for the four drainage areas within the Lower site. The flow analysis using a 10-year design storm event shows the portions of the runoff which expected to be captured by the detention vaults and which flow volumes might bypass detention. The results of the calculations indicate an annual average of 98% of the rainwater is expected to pass through the MTDs and thus be thoroughly treated. The remaining flow bypasses the detention vaults and the MTD treatment. It must be noted that, while the remaining flow volume during heavy rain event may bypass the detention and MTD units, the flow still is pre-treated by flowing through the vegetated buffer strips. In addition, under the "first flush" concept, storm water that bypasses the detention vaults and MTD treatment will not be the first flush, but runoff that is expected to be significantly less polluted than the first flush.

Section 7 shows the configuration of the outfalls for the four drainage areas in the Lower portion. The configuration of the WQ discharges, which means the water that passes through the four MTD units and is therefore highly treated, drives the design of the outfalls since the release point of the WQ outfall will be at the elevation of the adjacent Kapa'a Stream corridor. The overflow of the runoff,

the portion of the runoff which bypasses the detention, will be discharged using spillways that will be configured to dissipate hydraulic energy.

Section 8 shows the selected volumes of the four detention vaults of the four drainage areas in the Lower site. The required detention volume was calculated as the difference between the post- and pre-construction surface runoff, for a 10-year design storm event. The selected detention volume surpasses the required detention volumes for three of the four drainage areas. The ratio of selected versus required detention volumes increased from 1.05 to 1.2 for the drainage areas 2 to 4, with drainage area 4 being the most downslope and the most eastwards. The rationale of increasing the detention volumes for the drainage areas further East, and therefore at the lower site elevations, is that more deposited surface pollutants might accumulate on these lower sections of the Lower site. The selection of larger detention volume causes less storm water runoff from bypassing the detention vaults.

Section 9 presents an estimate of the amount of storm water bypassing the detention vaults for typical metrological rain events. Since no daily rainfall data was available for the project site, the estimation procedure used the reported monthly rainfall and number of rain days for the project site and combined the reported rain data with an assumed distribution of rain over the year. The assumed distribution was selected by a probabilistic approach. The results of the calculations suggest that for typical metrological storm events, 98% and 95% of the storm water volume is captured in the detention vaults for the entire year and the wet season (October to March), respectively. This prediction suggests a good performance of capturing the runoff in the detention vaults and passing them through the downstream filtering treatment of the MTD units.

SECTION 1: OVERVIEW OF DRAINAGE PROCESS APPROACH USED FOR ENTIRE PROJECT SITE

Figure 1.1 illustrates what storm water treatment processes are used in the Upper and Lower portions of the site.

The Upper portion of the site (Upper site) has a diverse system of storm water treatment processes and technologies. There are four storm water treatment and management approaches, A through D, which serve the newer buildings in the Upper site. The term "newer buildings" describes the buildings that were constructed or are still planned since the 2011 FEIS. The application of Low Impact Development (LID) technology and processes was prioritized where site conditions allowed.

The Lower portion of the site (Lower site) has one storm water treatment and management approach, where four drainage areas are served by the same SW treatment and management approach.

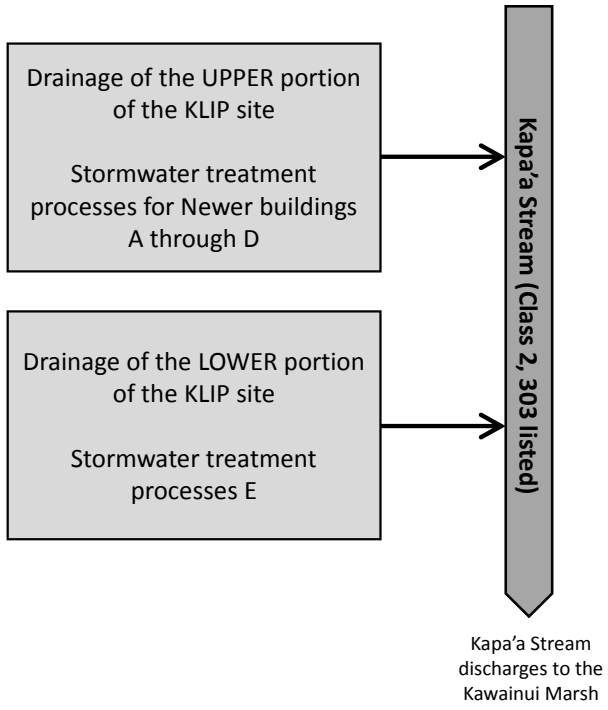

Figure 1.1: Storm water treatment and management processes for Newer buildings in the Upepr site

Note: Newer builings refer to buildings that were constructed or are under acttive site development after the 2011 FEIS was accpted. For the builidings that were constructed before the 2011 FEIS, the storm water treatment and managemet approach was not changed and is still used.

Figure 1.2 shows illustrates the system components of the four storm water treatment and management process used in the Upper site. Figure 1.3 illustrates the storm water system components in the Lower site.

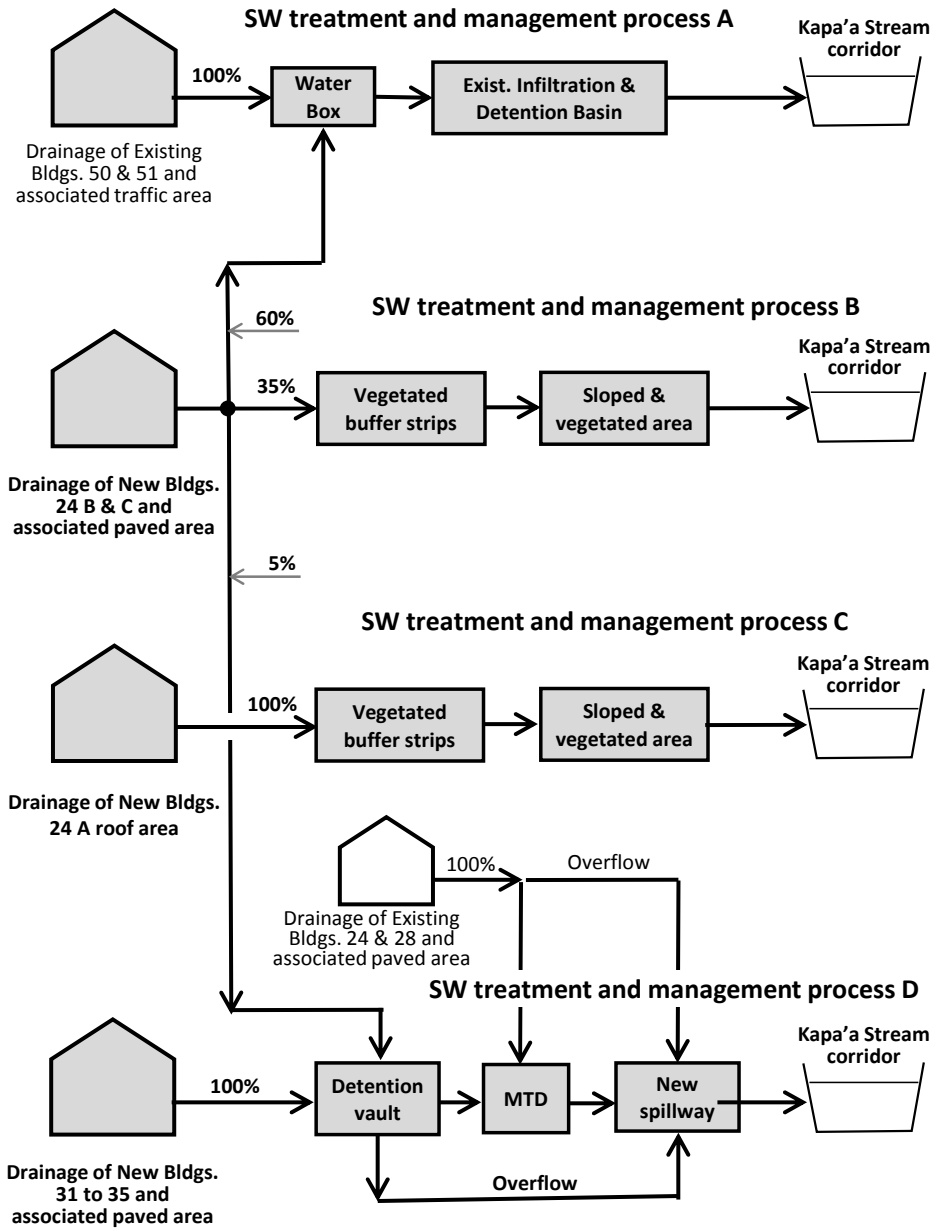

Figure 1.2: Four storm water (SW) treatment and management approaches used in the Upper project site

<u>Storm water (SW) treatment and management process A – Upper site:</u> Runoff from the existing buildings 50 and 51 and associated paved traffic area is conveyed to a water box, either as surface runoff directly to the water box or through drainpipes. Larger settable debris settles in the shallow compartments inside the water box and the remained flow exists the water box and flows into the existing infiltration and detention basin. The existing infiltration and detention basin was originally built to treat runoff from upstream land in the Kapa'a valley. With the storm water discharge approach of the

uphill land being changed, the existing infiltration and detention basin only serves the runoff from land within the property on which the project is located. The existing infiltration and detention basin has an area of 0.7acres, which provides sufficient LID capacity to accommodate the runoff from the existing Buildings 50 and 51, with associated paved traffic areas, as well as a 60% portion of the drainage area associated with the New buildings 24 B and C.

Storm water (SW) treatment and management process B– Upper site: This storm water treatment and management process will serve a 35% portion of the drainage area that is associated with New buildings 24 B and C. The runoff from the portion of the paved area around New buildings 24B and C, which is closest to the Northern site perimeter, flows through a 20-foot vegetated buffer strip and therefore receives LID treatment. The runoff is evenly applied to the vegetated buffer strip area through an inflow swale with overflow orifices every 4 feet. The inflow pipe extends over the entire width of the vegetated buffer strip. Thus, runoff is evenly distributed on the vegetated buffer strip. Downstream of the vegetated buffer strip the treated storm water flows through a sloped vegetated area inside the Kapa'a Stream corridor which is upstream of the stream bed.

Storm water (SW) treatment and management process C – Upper site: This storm water treatment and management process serves the newly constructed building 24 A. The runoff from the roof of Bldg. 24A is disconnected from the runoff from paved areas, thereby representing a runoff that has less pollutants than runoff from paved areas. The runoff from the roof of building 24A is collected in gutters and conveyed through downspouts which terminate in a horizontal distribution pipe that extends the entire width of the vegetated buffer. The vegetated buffer strip has a length of approximately 20-feet. Downstream of the vegetated buffer strip the treated storm water flows through a sloped vegetated area inside the Kapa'a Stream corridor which is upstream of the stream bed.

Storm water (SW) treatment and management process D – Upper site: This storm water treatment and management process will serve the New buildings 31 through 35. This storm water process system cannot incorporate LID technologies and therefore uses structural means to provide detention capacity and filtering through a MTD unit. The entire runoff from the drainage area that is associated with New Bldgs. 31 through 35, as well as a small (15,000 sqft) portion of the paved drainage area around the New Bldg. 24B, flows through a system of large diameter drainpipes that provides 98% of entire detention volume. The remainder of the detention volume is provided by the water box, which is located at the terminus of the drainpipe system. The water box that serves two important functions. First, it provides for a steady and delayed release of the detained storm water to the MTD unit, over a period of approximately 36 hours. Second, it has an overflow weir that discharges excess volume of stormwater runoff, thus avoiding upstream flooding. In addition to draining the drainage area associated with the New buildings 31 through 35 the process also accommodates the water quality (WQ) runoff from the drainage area of the existing buildings 24 and 28 and the associated paved traffic areas. The runoff from the drainage area of the existing building 24 and 28 does not flow into the detention vault but flows directly into the MTD unit. The overflow of all connected drainage areas bypasses the MTD unit and discharges to the newly constructed spill way.

The SW treatment and management processes A through D are illustrated in Figure 1.2.

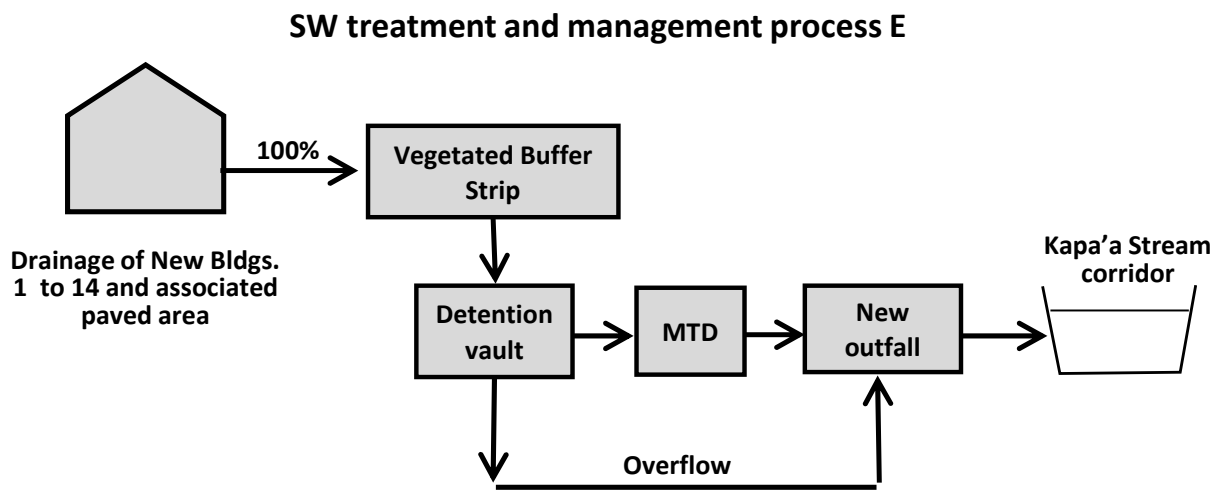

Figure 1.3: Single storm water (SW) treatment and management approach used in the Lower project site

<u>Storm water (SW) treatment and management process E – Lower site:</u> All of the four drainage areas within the Lower site, which will serve the 14 New buildings in the Lower site once built, will be drained by the SW treatment and management process E. Under the SW treatment and management process the drainage from roofs and traffic areas will enter drain inlets which have debris separating screen that catch larger floatables and settables. The runoff is then conveyed through drainpipes of up to 1,200 feet to vegetated strips which are constructed above the below ground detention vaults. After flowing through the vegetated buffer strip the runoff enters the below ground detention. The runoff in the detention vaults is released over a period of approximately 36 hours and passes through the MTD units. If the detention vaults are filled the runoff overflow of the four drainage areas is conveyed to the outfall structure that releases the runoff to the Kapa'a Stream corridor. The armored outfall structure is equipped with a rip rapped section that dissipates the hydraulic energy and distributes the overflowing runoff evenly to a wider vegetate areas of the Kapa'a Stream corrido. The flow through the MTD units uses a separate discharge structure because of the different discharge elevation and the much smaller flow rate than the overflow. Refer to Figure 1.3 for the illustration of the SW treatment and management process E.

SECTION 2 - STORM WATER QUALITY TREATMENT EFFICACIES OF THE TREATMENT AND MANAGEMENT TECHNOLOGIES USED

This section describes the storm water treatment and management technologies and practices used at the site. The individual treatment components are described, followed by the description of how the components work together for the different storm water treatment management processes A - E.

Stormwater Treatment Train approach: The approach of a configuring stormwater treatment trains offers significant advantages regarding mitigating storm water pollution impact to the adjacent receiving waters. The stormwater treatment train concept has been successfully employed for storm water management, where a multi-BMP approach manages the quantity and quality of stormwater runoff. It typically included prevention and source control practices.

BMPs utilizes one or more treatment processes that work together to remove pollutants utilizing combinations of hydraulic, physical, biological, and chemical methods. A well-developed stormwater treatment train will combine processes in a manner that ensures management of all pollutants that have been identified as affecting the receiving waters.

Hydraulic and physical processes remove larger solids and associated pollutants while biological and chemical processes treat the finer solids and dissolved pollutants occur between storms. A well-performing treatment train can achieve the following three basic objectives:

- Reduce the runoff quantities by utilizing hydraulic processes (detention, infiltration)
- Remove settleable solids and floatables by utilizing physical process (screens, settling chambers)
- Remove suspended and colloidal solids by utilizing a physical, biological, or chemical process (media filtration, Phyto filtration)

Figure 2.1 suggests treatment processes for a range of particulate sizes commonly found in stormwater runoff.

A stand-alone stormwater treatment train employs a single BMP, such as a stormwater vegetated buffer strip, that utilizes multiple treatment train processes. A multi-BMP treatment train utilizes BMPs operating in series or parallel to each other. Treatment trains can include Low Impact Development (LID) and traditional treatment approaches. The objective of LID is to keep the precipitation as close to its source as possible utilizing techniques such as infiltration, capture/storage/reuse, Phyto filtration or evaporation. More traditional methods typically employ processes such as filtration and sedimentation practices. Best practices prefer the use of LID processes as they reduce both stormwater volume and pollutant loading. LID practices can be constrained by site factors, such as soil that is not suitable for infiltration, soil or groundwater contamination, and space limitations, including insufficient grade slopes to provide hydraulic flow energy for longer swales.

The following are practices and BMPs that are used in the storm water treatment trains used at the project site:

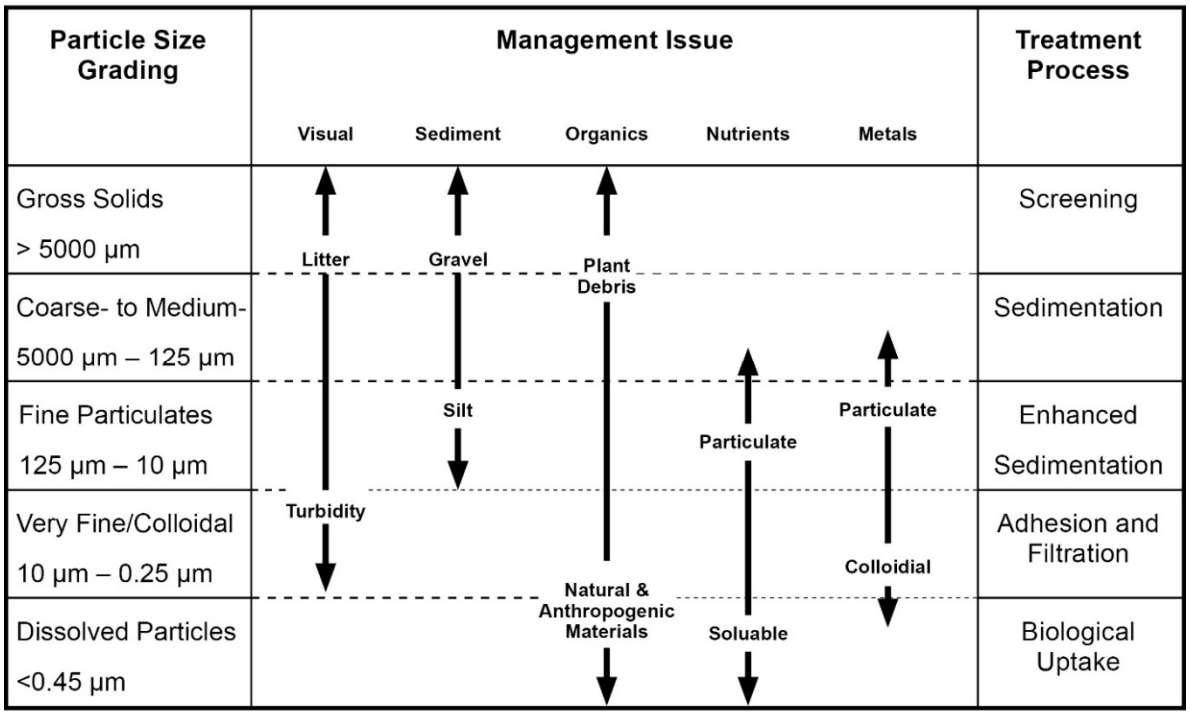

Figure 2.1: Treatment processes for a range of particulate sizes commonly found in stormwater runoff (source Wong, et. al. 2002)

Sources control: The first step in curbing pollutants from entering the drainage system is to eliminate or minimize the pollutant loads at the source. For the entire project site, a comprehensive source control system has been implemented that follows the strict pollution abatement process of the NPDES no exposure exclusion. A comprehensive source control program has been implemented as part of the NPDES No Exposure Exclusion certification which the operator of the Kapa'a Light Industrial Park has obtained, and which is maintained through an active audit program.

The Conditional Exclusion from Stormwater Permitting Based on "No Exposure" of Industrial Activities to Stormwater requires, among others, that material handling, storing, and processing should not result in pollutants exposed to rain and subsequent entrainment of pollutant into the runoff.

Drain inlets with debris capture and settleable screens: Storm water runoff from paved traffic areas and roof drainage will enter the drainage piping system through a series of drain inlets. The drain inlets will be fitted with debris capture and screens that will hold back coarse settleable material.

Drainpipes: The runoff will be conveyed through drainpipes from the drain inlets to the storm water treatment and management facilities at the Northern site perimeter.

For the Upper site, a series of large diameter drainpipes was used as detention volume, with a water box at the pipe terminus providing a flow constraint with free surface and overflow weir for peak flow control. Sedimentation occurs along the up to 1,600 feet of relative slow-moving flow and the water box at the pipe terminus is expected to remove larger quantities of coarser settleable debris.

For the Lower site, the drainpipes do offer only conveyance where the flow velocity is such to avoid sizable sedimentation. No pollutant removal or detention will occur inside the drainpipe system in the Lower site.

Water distribution or collection box: The current storm water treatment and management system is a water box - a hydraulic structure that collects runoff before it is further conveyed to an outfall of to a downstream filtering units. Quantities of settleable material in the storm water runoff will settle and are therefore removed from the runoff flow. The settled material will be regularly removed from the water box.

Vegetated buffer strip: A vegetated buffer strip is a grassy slope vegetated with turf grass that is designed to accommodate sheet flow. (DPP, 2017)

Particulate matter will be filtered from the runoff while flowing through the vegetation. Quantities of dissolved matter will be absorbed by plant material while the runoff flows through the plant material. The selection of plant material and the dimensions of the vegetated buffer strip will determine the amount of pollutants removed from the runoff.

In the Upper site, one vegetated buffer strip is used for the treatment of the roof runoff from Building 24 A. An additional system of three vegetated buffer strips will be used to treat the runoff from the New buildings 24B and C as well as a portion of paved traffic areas around the buildings 24B and C that borders to the Norther site perimeter.

In the Lower site four larger vegetated buffer trips will be used in the four drainage areas as treatment for the entire runoff. In this SW treatment train, storm water will flow through the vegetated buffer strips which will be located upstream of the detention vaults. The vegetated buffer strip serves an important function of removing settable particles from the flow, thereby significantly reducing the potential load of particles entering the detention vaults. In addition, the vegetated buffer strip will capture quantities of dissolved pollutants through absorption processes in the biological matter.

Detention vault: The underground detention vaults do remove some of settable material from the runoff through precipitation. Furthermore. The below ground detention vaults will mitigate thermal impact on the receiving water by providing a cooling effect of the runoff, which could be heated while it runs over hot pavement.

Manufactured Treatment Device (MTD): A manufactured treatment device is a proprietary water quality structure utilizing settling, filtration, adsorptive/absorptive materials, vortex separation, vegetative components, or other appropriate technology to remove pollutants from storm water runoff. (DPP,2017)

MTD units are highly effective on removing particulate matter through media filtration. There will be five MTD units installed at the project site, one in the Upper site and four in the Lower site. All the MTD units will be located downstream of the detention vaults, thereby receiving relatively small flow rates as the detained water is released from the detention over a longer time period.

Infiltration and detention basins: An infiltration basin is referred to as a shallow impoundment with no outlet, where storm water runoff is stored and infiltrates through the basin invert and into the soil matrix. A detention basin is referred to as shallow man-made impoundment intended to provide for the temporary storage of storm water runoff to allow particles to settle. It does not have a permanent pool and is designed to drain between storm events. (DPP, 2017)

The combined infiltration and detention basin is used offsite the Upper site. The existing 0.7-acre infiltration and detention basin next to the existing building 50 provides removal of suspended material as well as dissolved pollutants. In addition to the water quality improvements the basin also provides flood control. The lower site does not have any infiltration and detention basins, because of space limitations, and the requirement by the US Fish and Wildlife Service (USFWS) to avoid free surfaces in the Lower portion of the site, to avoid attraction of listed water birds from the Kawainui Marsh.

Rainwater Harvest/Reuse: Referred to as capture/reuse or rainwater harvesting, is the collection and temporary storage of roof runoff in rain barrels or cisterns for subsequent non-potable outdoor use (landscape irrigation, vehicle washing) (DPP, 2017). Storm water harvesting and subsequent use for irrigation is being used at the project site.

- Within the Upper site, stormwater will be captured and reused to irrigate the turf grass of one vegetated buffer strip.
- Within the Lower site, stormwater will be captured and reused on a larger scale for all four drainage areas. The intended use is mainly irrigation of the four vegetated buffer strips and portions of the vegetated perimeter berms.

Table 2.1 shows an overview of the expected pollutant removals effectiveness for the type of BMPs used in Upper and the Lower site:

Table 2.1: Overview of the expected pollutant removals effectiveness for the type of BMPs used in Upper and the Lower site (Source, DPP 2017)

	Levels of Expected Pollutant Removals Effectiveness: H = High; M = Medium; L = Low; U = Unknown							
BMP Description	Nutrients	Sediment	Trash	Pathogens	Pesticides	Oil & Grease	Metals	Organic Compounds
Detention Basin	L	M	H	L	U	M	L/M	U
Infiltration Basin	H	H	H	H	H	H	H	H
Harvest/Reuse	L	M	M	L	U	M	M	M
Vegetated Buffer Strip	L	M	M	L	U	M	M	M
Manufactured Treatment Device (MTD)	Varies based on System: Minimum Total Suspended Solids water (TSS) Removal is 80%							
Detention vault (not defined by DPP)	Pollutant removal is limited to some sedimentation; pretreatment should remove most of the settable; Thermal pollution is reduced since stormwater is cooled inside the underground detention vault before release to the receiving water							

SECTION 3 - NEW DRAINAGE AREAS IN LOWER SITE

The Lower portion of the site divided into four drainage areas. Table 3.1 shows the sizes of the four drainage areas, 1 through 4.

Table 3.1: Sizes of the four drainage areas (drain areas) of the lower site

		Drain area 1	Drain area 2	Drain area 3	Drain area 4
Drainage area	acre	5.6	4.7	5.0	3.1

Figures 2.1 through 2.4 show the location and extent of the four drainage areas. The figures describe that the drainage areas are drained by means of below ground drainage pipes with storm water treatment and management facilities upstream of the outlets to the Kapa'a Stream corridor.

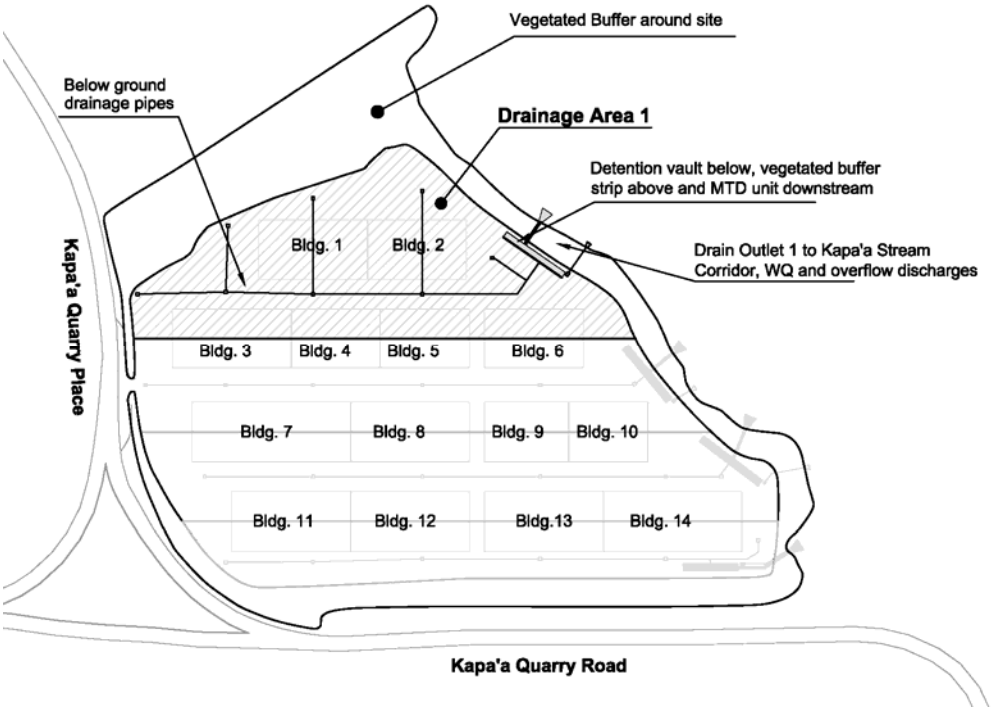

Figure 3.1: Location and size of drainage area 1

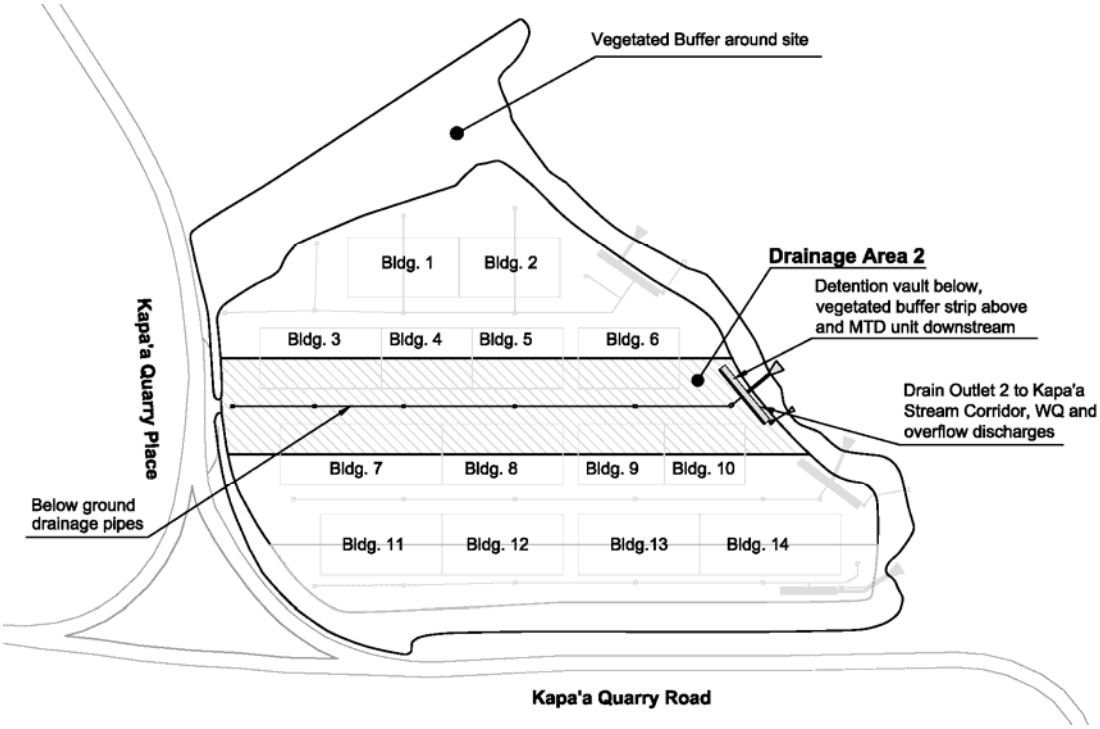

Figure 3.2: Location and size of drainage area 2

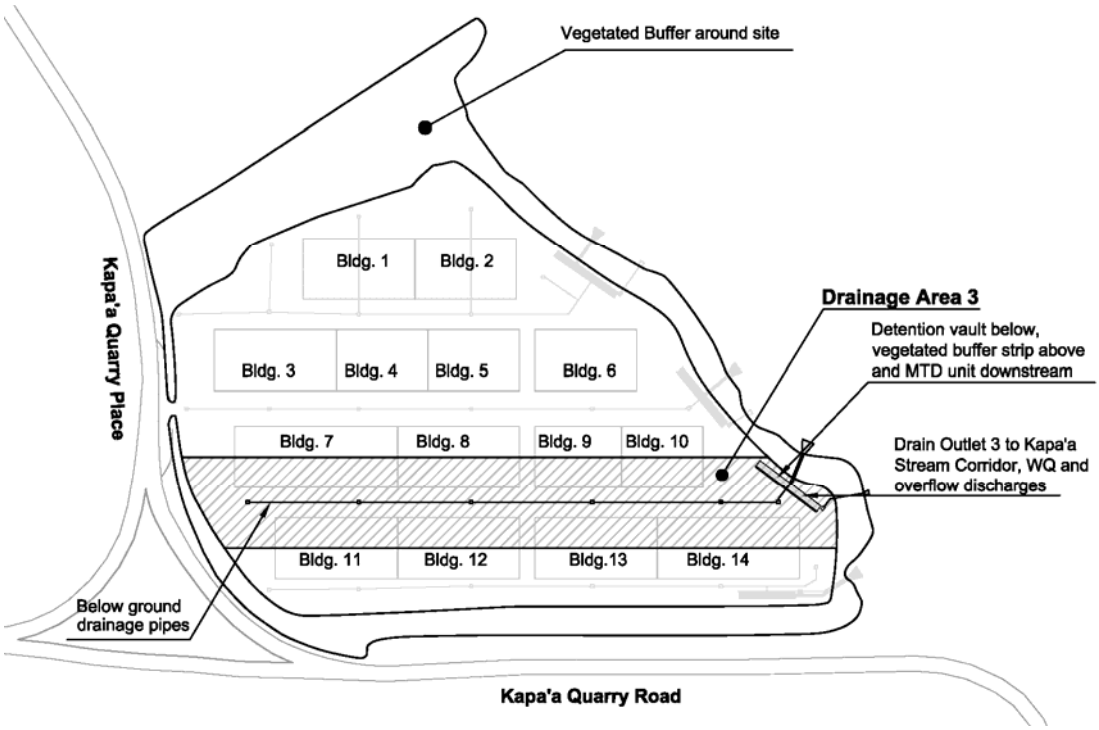

Figure 3.3: Location and size of drainage area 3

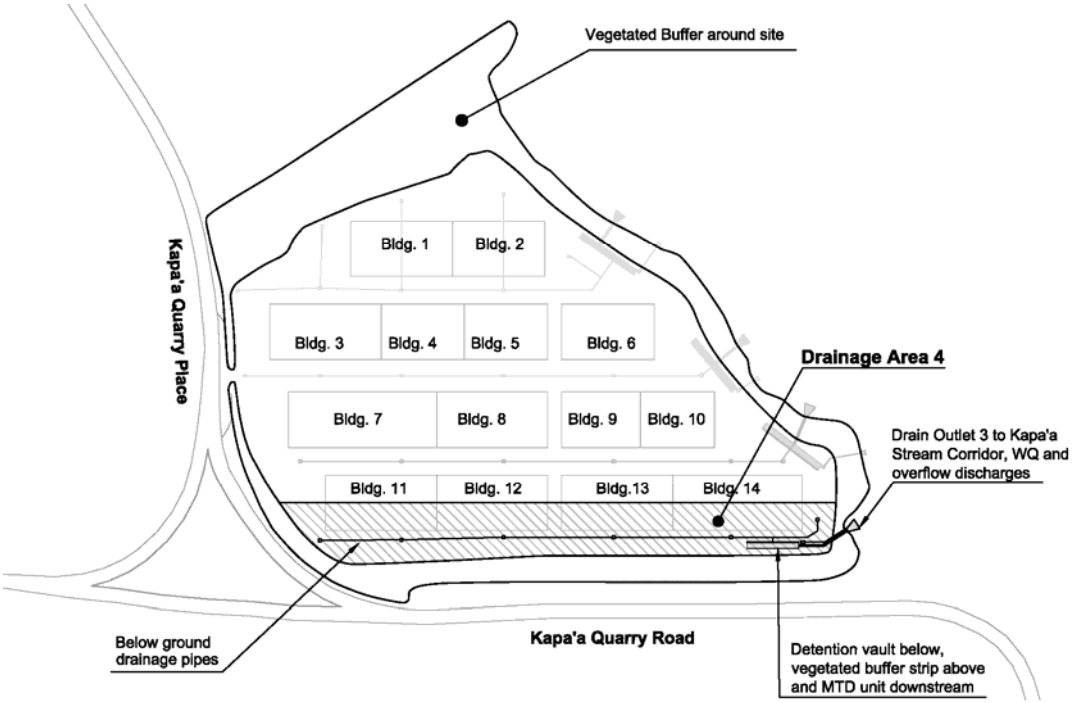

Figure 3.4: Location and size of drainage area 4

SECTION 4 – PRE-CONSTRUCTION DRAINAGE IN LOWER SITE

During the pre-construction phase of the Lower site stormwater runoff was not treated or managed. Precipitation infiltrated in the landfill body and subsequently generated leachate that moved underground to downgradient locations, where it either remained underground or emerged. During normal rain events a large quantity infiltrated into the landfill body. During stronger rain events, such as the 10-year design storm, the upper soil layers would become saturated, leading to significant surface runoff at locations where there earther dikes did not exist.

Figure 4.1 shows the assumed surface runoff from the site during the 10-year design storm event. The illustration is a storm water runoff flow diagram that indicates the estimated total surface runoff volumes from the design 10-year storm event. The runoff is shown associated with the post-construction four drainage areas. Figure 4.1 indicates that all runoff was released from the unpaved surface without treatment.

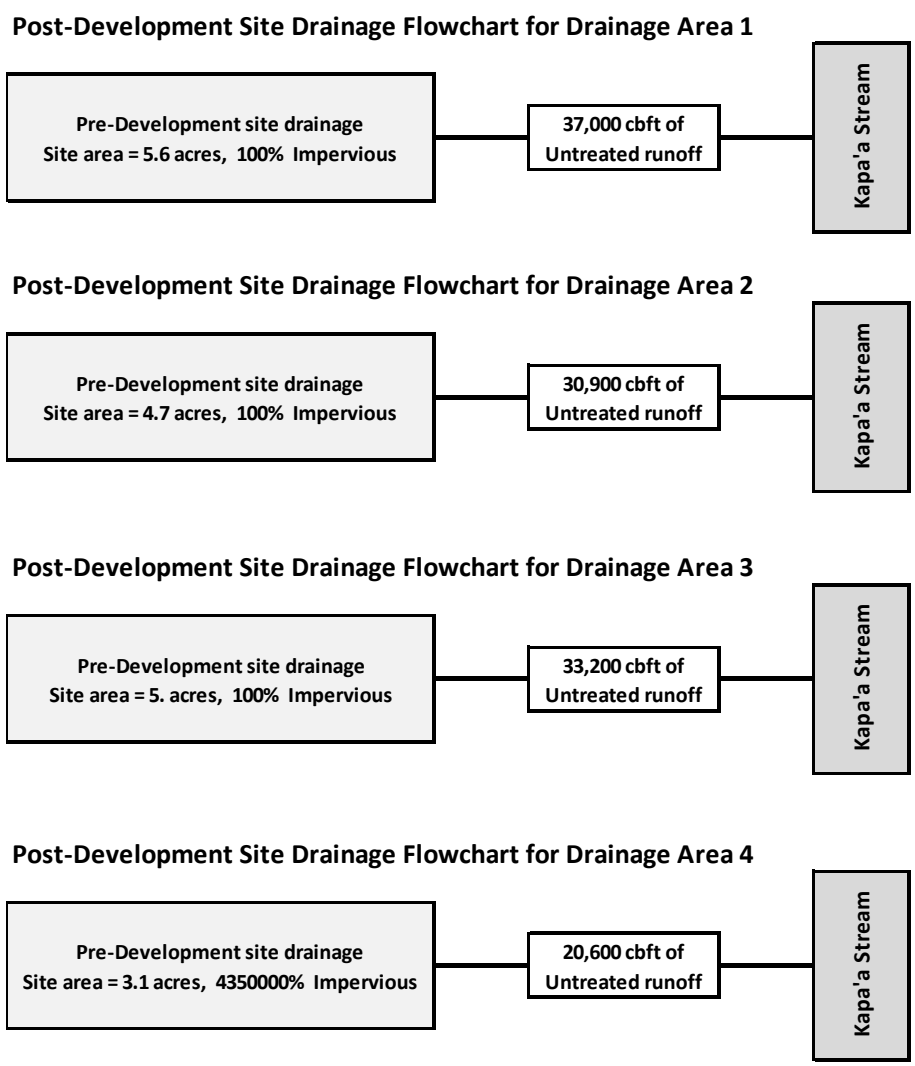

Figure 4.1: Flow diagram of pre-construction total surface runoff for four post-construction drainage areas assuming 10-year design storm event

SECTION 5 - RUNOFF FOR POST-CONSTRUCTION DRAINAGE SYSTEM IN LOWER SITE

Table 5.1 shows the results of the calculation for the stormwater runoff from the four drainage areas within the Lower site. Table 5.1 shows the pre- and post-construction runoff. The difference between the post- and pre-construction runoff determines the required size of the detention volumes.

Table 5.1: Storm water runoff from four drainage areas (drain areas) in the Lower site

Runoff calculations:	Units	**Drain area 1**	**Drain area 2**	**Drain area 3**	**Drain area 4**
Detention basin calculation					
size of project area	acres	5.6	4.7	5.0	3.1
10 year storm event	inch	2.5	2.5	2.5	2.5
Percentage of impervious area		100%	100%	100%	100%
Pre development:					
Rv for runoff		73%	73%	73%	73%
Post development					
Rv for runoff		95%	95%	95%	95%
Runoff					
Pre development:	cbft	37,000	30,900	33,200	20,600
Post development	cbft	48,400	40,500	43,500	27,000
Difference (required detention)	cbft	**11,400**	**9,600**	**10,300**	**6,400**
Detention vault:					
Amplification Factor for detention volume	[-]	100%	108%	115%	120%
Selected Detention volume	cbft	**11,400**	**10,400**	**11,800**	**7,700**
Preliminary dimensions: (rounded)					
Width	ft	13	13	13	12
Height	ft	6	6	6	6
Length	ft	140	140	150	110

SECTION 6 - PROPOSED POST-CONSTRUCTION DRAINAGE SYSTEM IN LOWER SITE

Figures 6.1 through 6.4 show the flow diagrams of the four post-construction drainage areas within the Lower site. The diagrams indicate that the entire runoff flows through the vegetated buffer strips before they either enter the detention vaults or bypassing then. The detention vaults are bypassed when the detention vaults are filled to capacity. The diagrams show the runoff volumes for the 10-year design storm event. Under this runoff scenario, the first flush is captured in the detention vaults. After the detention vaults are filled the runoff bypasses the detention vaults. When detention is bypasses the runoff is not flowing through the MTD units and therefore it is not filtered.

Figures 6.1 through 6.4 indicate that the selected detention vault volumes of areas 2,3 and 4 are larger than the required volumes. The required detention vault volumes were calculated from the difference of post-construction and pre-construction runoff. Therefore, increasing the detention vault volumes above the required values decreases the flow of storm water runoff that bypasses the detention vaults, and thereby bypassing the filtering treatment in the MTD units. It needs to be kept in mind, however, that all the storm water runoff passes over the vegetated buffer strip. Therefore, no storm water runoff leaves the site without basic LID treatment.

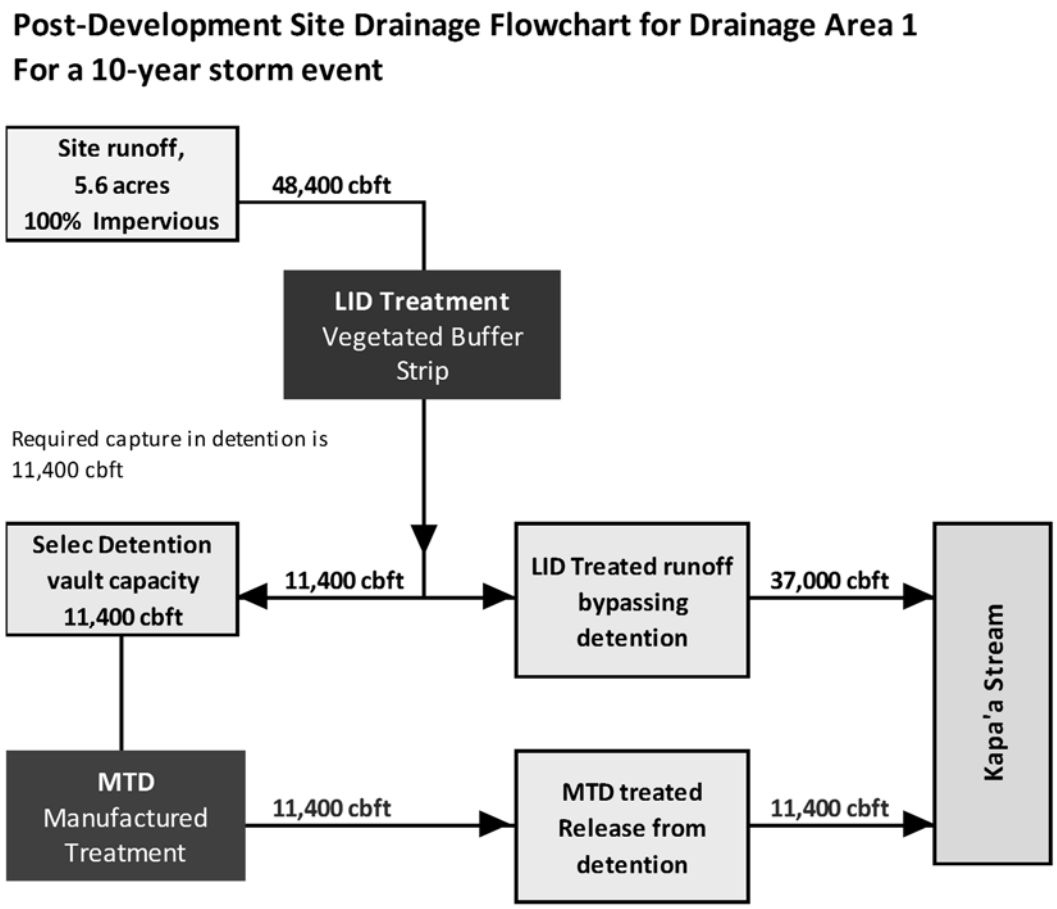

Figure 6.1: Flow diagram for drainage area 1 within the Lower site

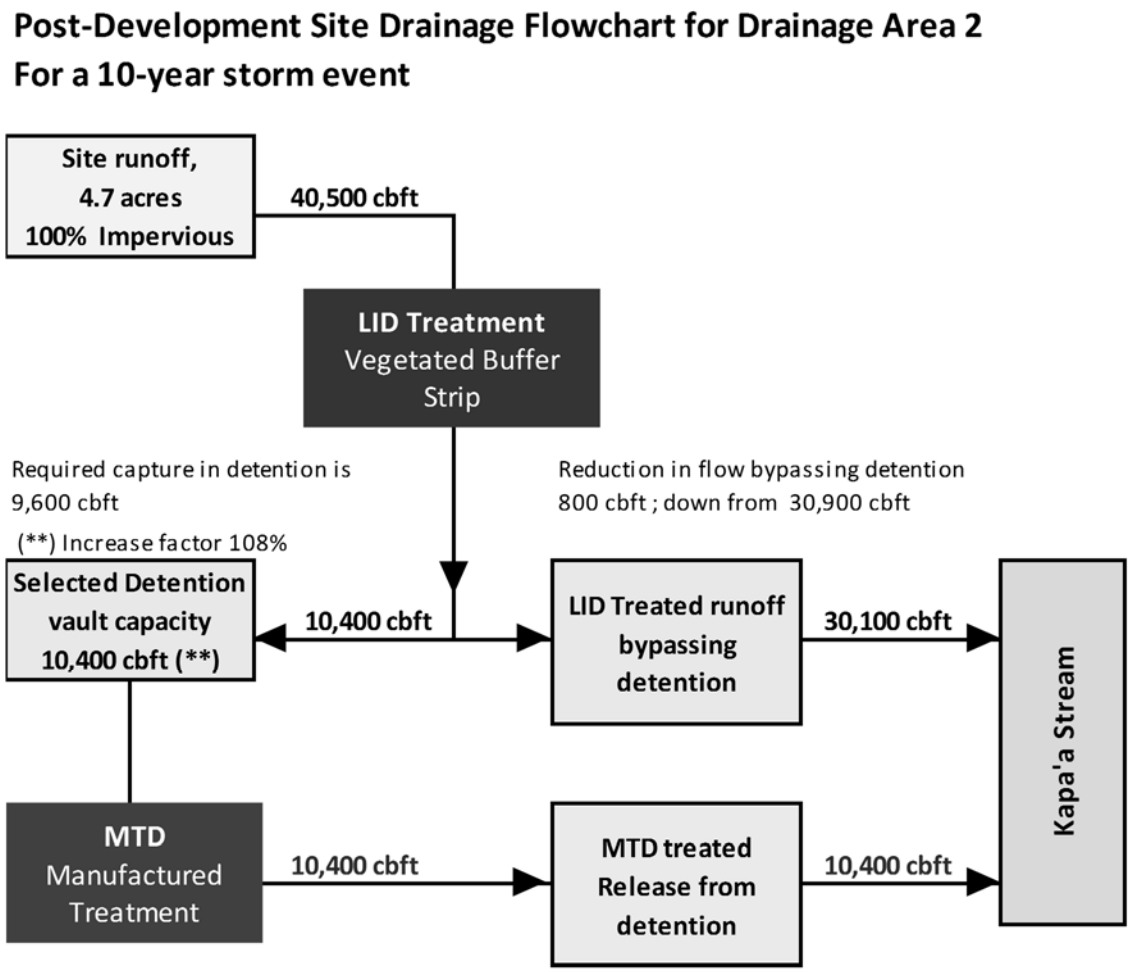

Figure 6.2: Flow diagram for drainage area 2 within the Lower site

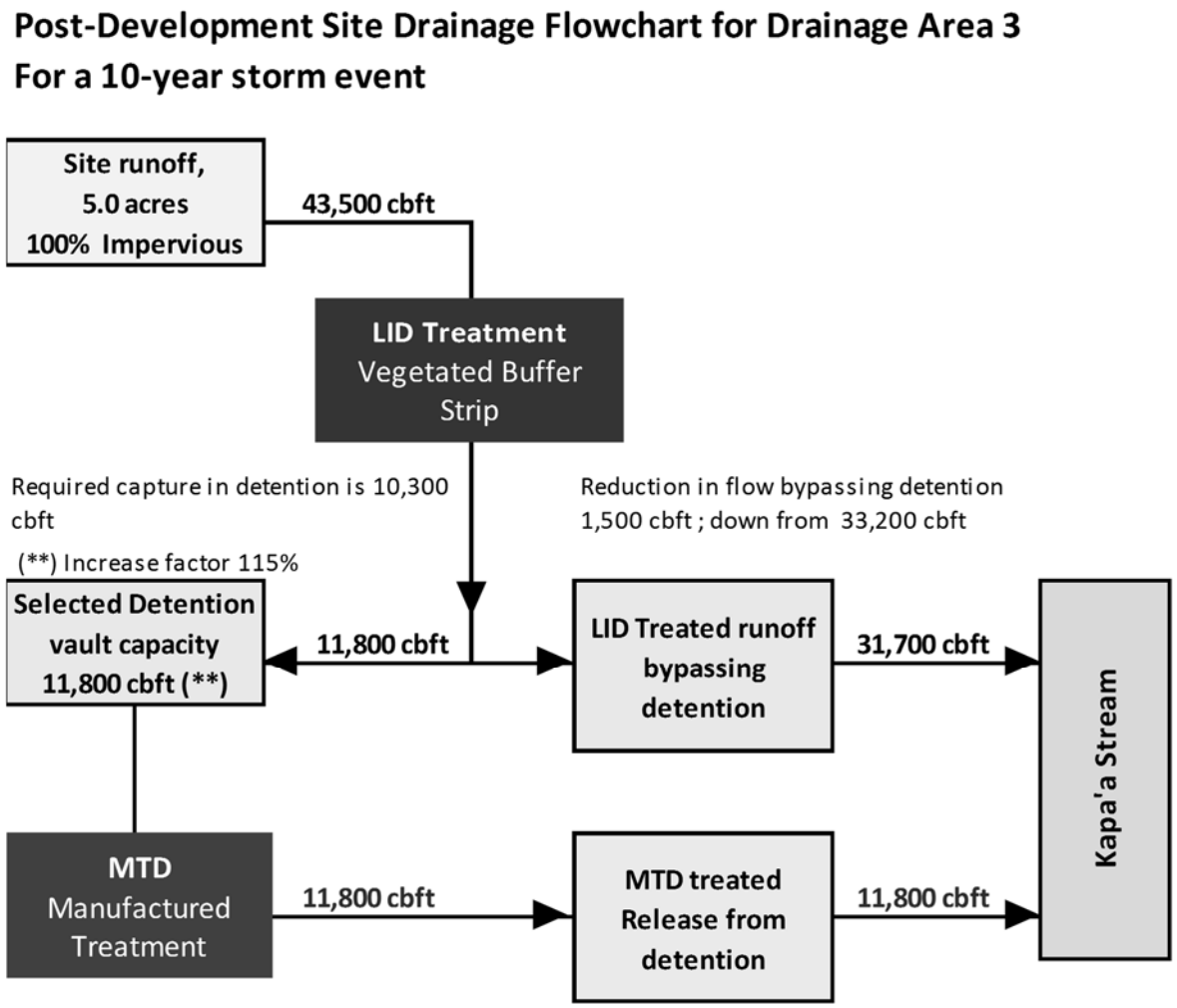

Figure 6.3: Flow diagram for drainage area 3 within the Lower site

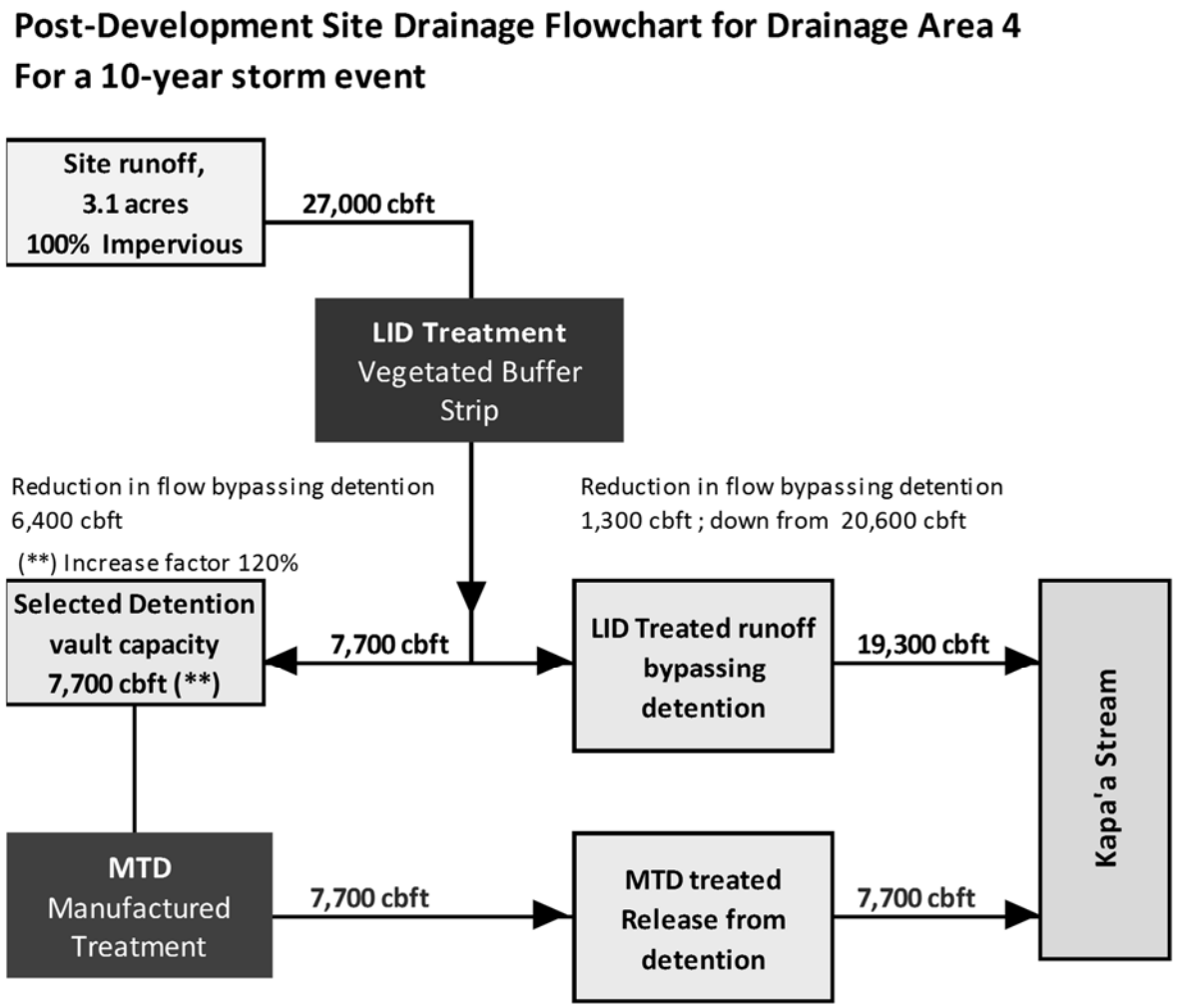

Figure 6.4: Flow diagram for drainage area 4 within the Lower site

SECTION 7 - OUTFALLS OF FOUR DRAINAGE AREAS OF LOWER SITE TO THE KAPA'A STREAM CORRIDOR

Figure 7.1 illustrates the drainage system of the Lower portion of the site (Lower site). The four drainage areas each have a main drainpipe running from the Southern to the Northern site perimeter. The storm water treatment and detention facilities are located at the terminus of the four drainpipes, located near the Northern site perimeter. After the storm water passes through the vegetated buffer strip, the detention vaults and the MTD units, the runoff is released to the Kapa'a Stream corridor.

Typically, the discharged stormwater from both the WQ and the overflow outlets will enter vegetated land and not the stream bed. This will enhance the effectiveness of the storm water treatment, since storm water that is released to vegetated land within the stream corridor will infiltrate or the vegetation will serve as a treatment filter. Figure 7.2 shows the elevations of the site inside the perimeter berms and the foot of the berms at the Northern site perimeter; along a station line which starts on the perimeter berm close at the Kapa'a Quarry Road and extending towards the Western site perimeter.

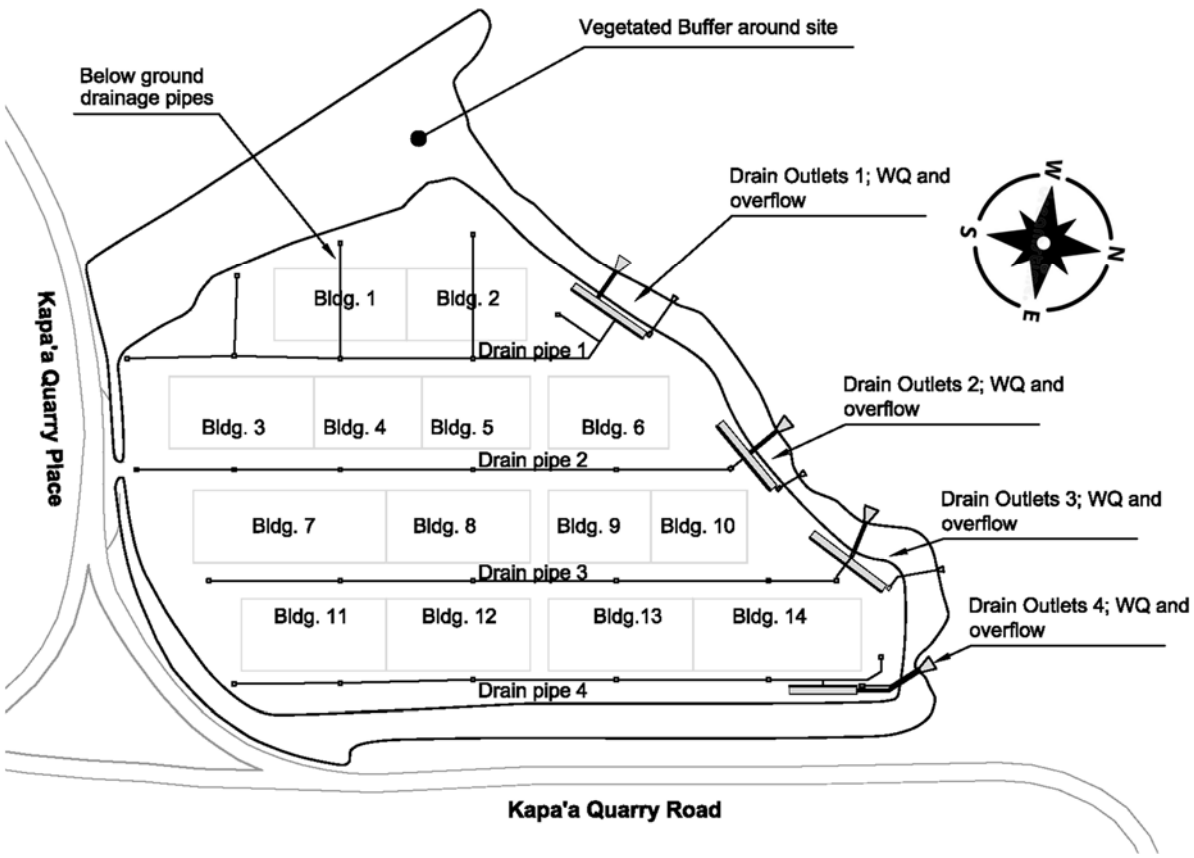

Figure 7.1: Elements of the storm water drainage and treatment system of the Lower site

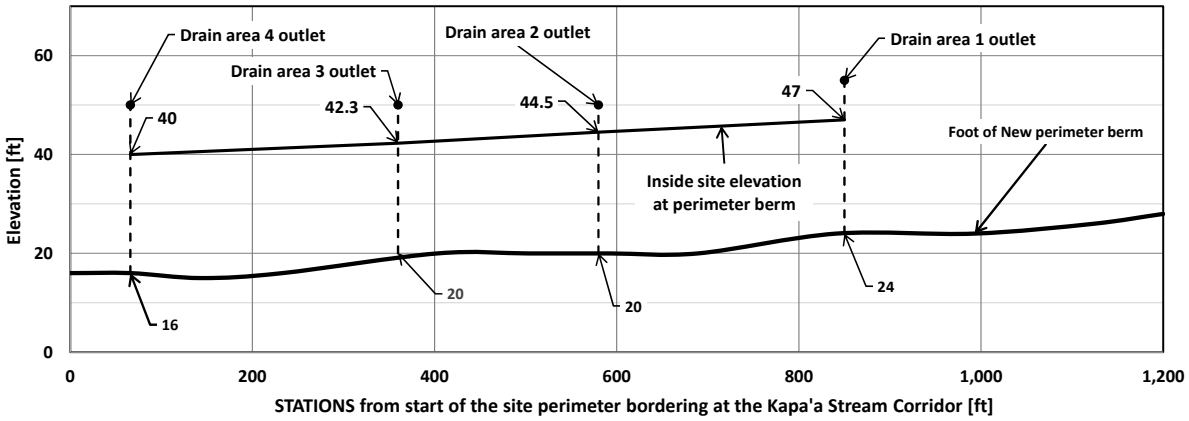

Figure 7.2: Elevations of the site inside the perimeter berms and the foot of the berms at the Northern site perimeter

Figure 7.3 shows the station line referred to in Figure 7.2. Figures 7.4 through 7.7 show the cross section through the site perimeter berms where the outlet of the WQ flow is discharged to the Kapa'a Stream corridor.

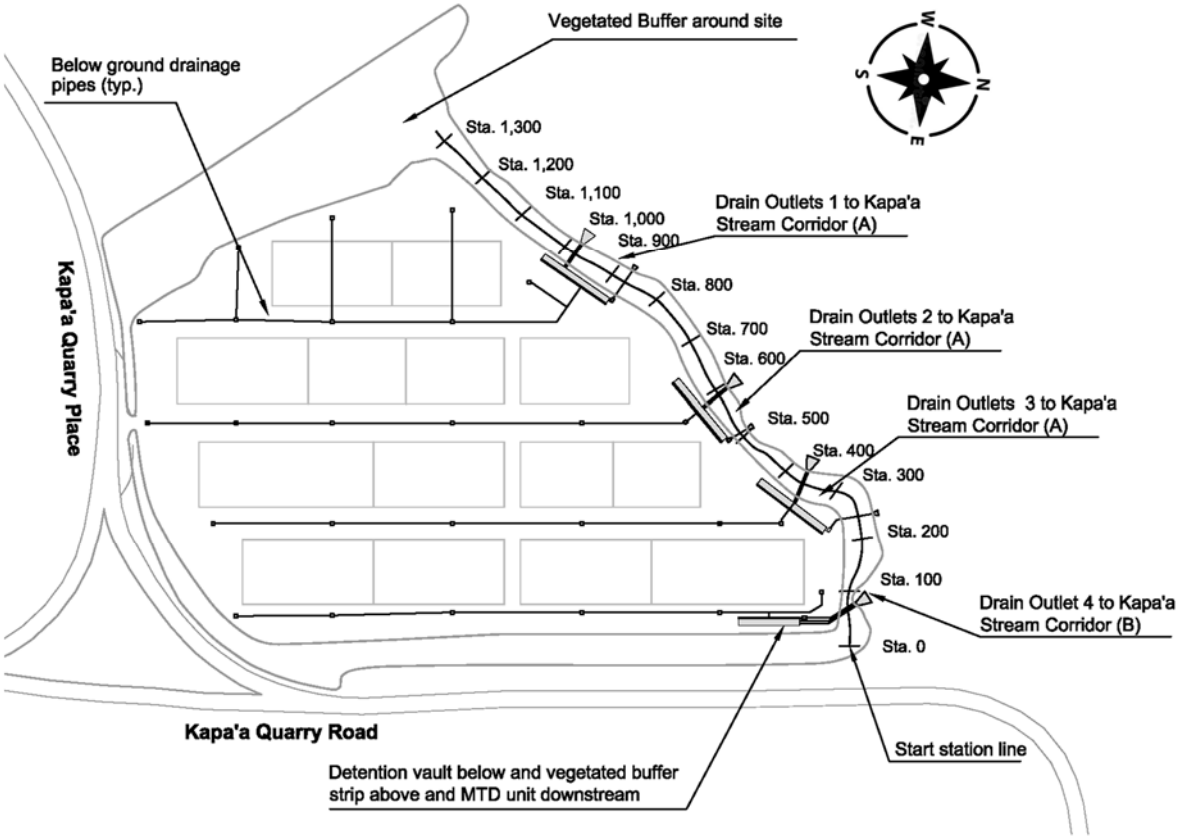

Figure 7.3: Elements of the storm water drainage and treatment system of the Lower site

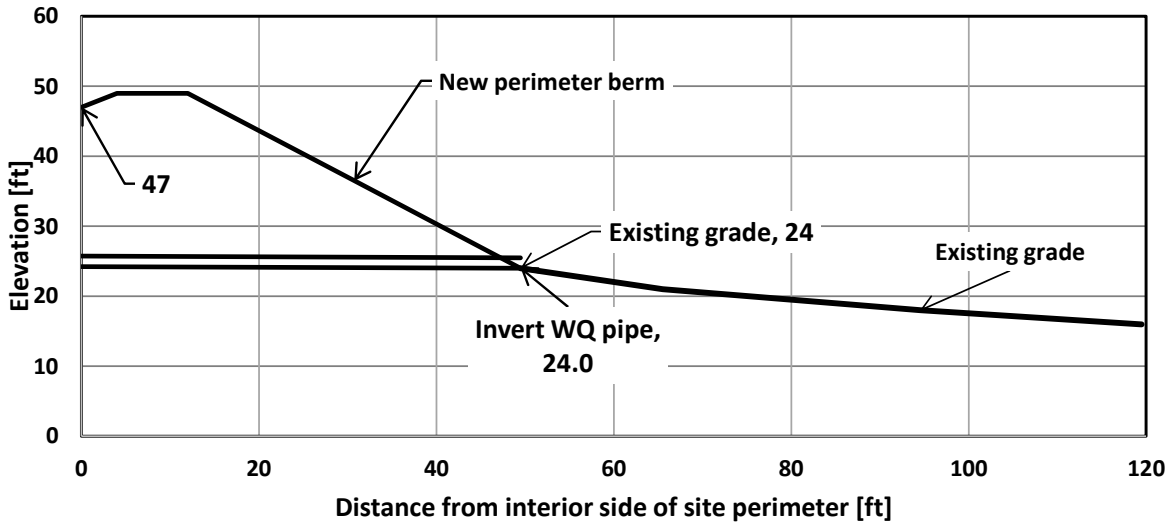

Figure 7.4: Cross section through the New Northern site perimeter berm at the location of the outlet for drainage area 1

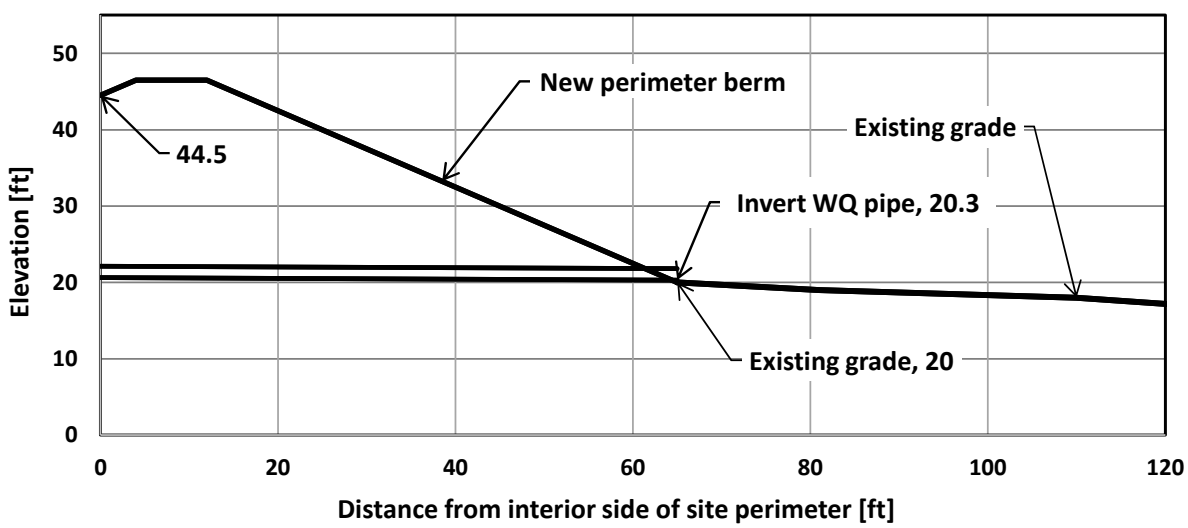

Figure 7.5: Cross section through the New Northern site perimeter berm at the location of the outlet for drainage area 2

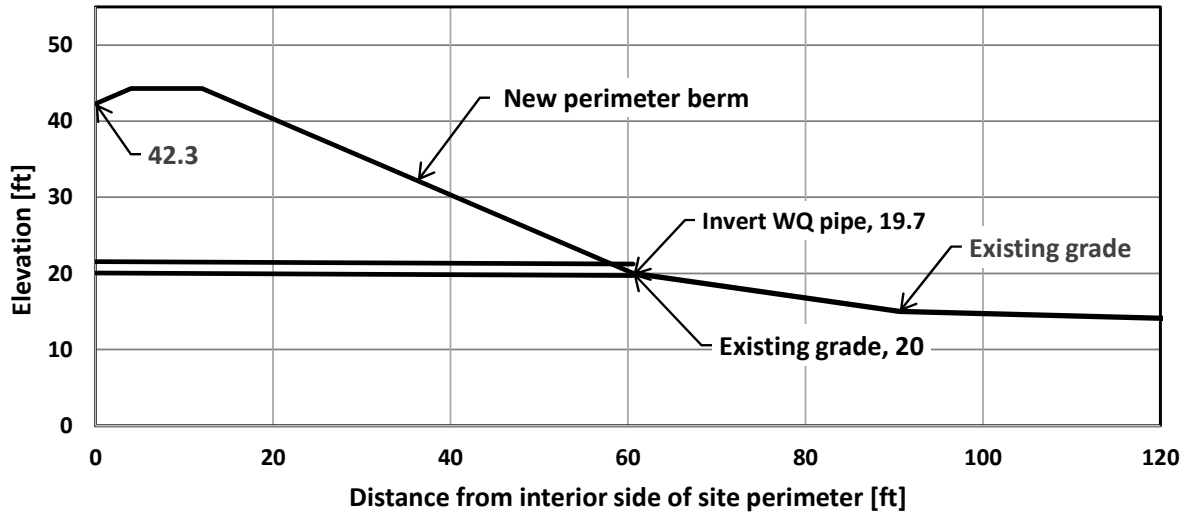

Figure 7.6: Cross section through the New Northern site perimeter berm at the location of the outlet for drainage area 3

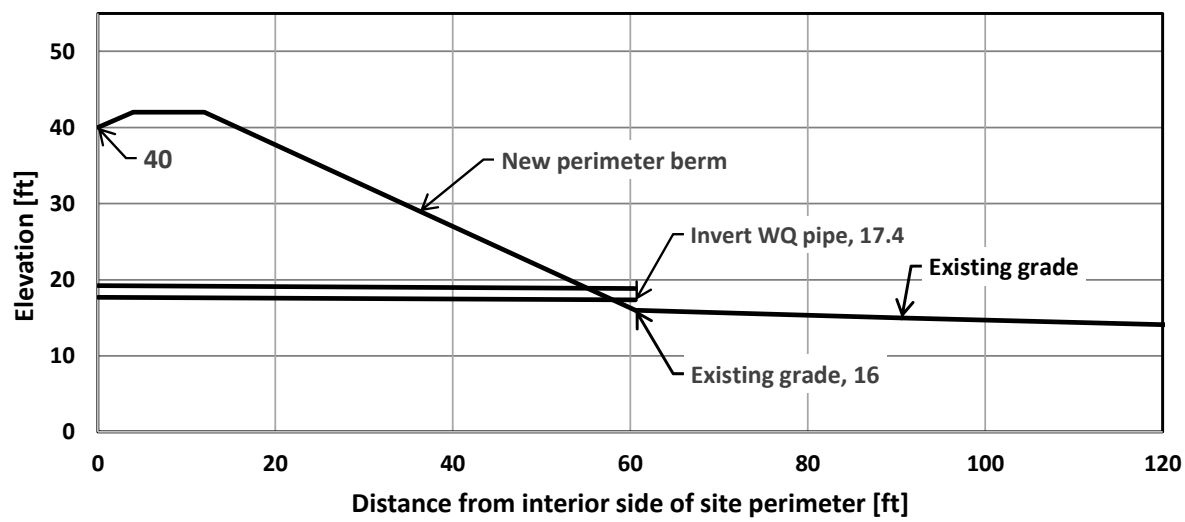

Figure 7.7: Cross section through the New Northern site perimeter berm at the location of the outlet for drainage area 4

SECTION 8 - DETENTION VAULTS VOLUMES WITHIN THE LOWER SITE

Volumes of detention vaults in the lower site increase from Drain Areas 1 to 4, with the Drain Area 4 being closest to the Eastern site boundary and the area with the lowest elevation. It is assumed that increasing the detention volume continuously from Drain Area 1 to 4 should improve the runoff quality by increasing the flow rate of runoff that passes through the MTD units.

Since there will be a 0.8 % slope of the finish grade going from West to East it is assumed that the amount of surface deposition of potential storm water pollutants would increase downslope, thus from West to East of the site. Therefore, more pollutants is expected to be entrained and transported by runoff Eastwards on the site. Since more storm water is held back in the detention vaults, a higher portion of the storm water passes through the MTD and therefore less portion of the runoff bypasses the detention vaults.

Table 8.1 and Figure 8.1 show comparisons between the required and selected detention volumes.

Table 8.1: Comparison of required and selected detention volumes

		Drain area 1 cbft	**Drain area 2** cbft	**Drain area 3** cbft	**Drain area 4** cbft
Required detention volume	cbft	11,400	9,600	10,300	6,400
Selected detention volume	cbft	11,400	10,400	11,800	7,700
Increase above the required detention volume	cbft	0	800	1,500	1,300
	%	0%	8%	15%	20%

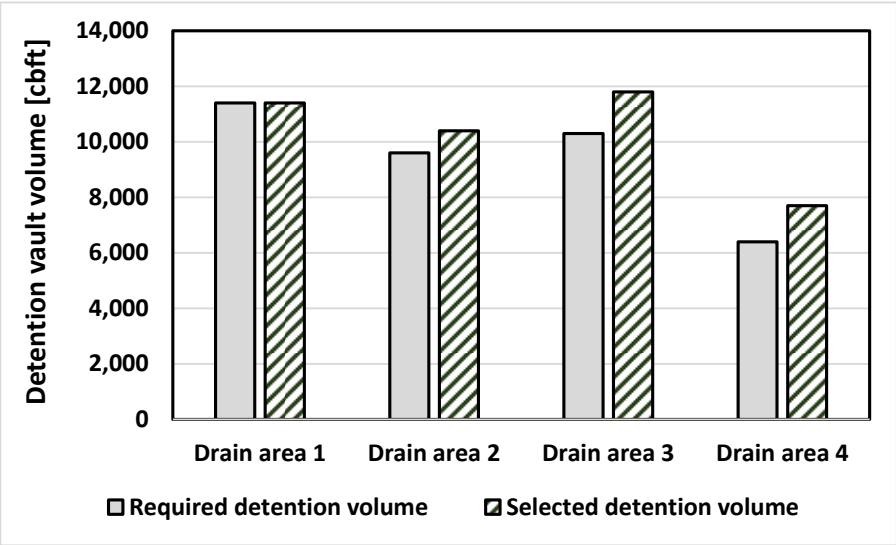

Figure 8.1: Comparison of required and selected detention volumes

SECTION 9 - ESTIMATED VOLUME OF STORMWATER BYPASSING DETENTION IN THE LOWER SITE

Section 9 describe the quantities of runoff that would bypass the detention vaults under the 10-year storm event design scenario.

This Section 9 describes the assumed quantity of storm water bypassing the detention vaults under typical metrological conditions. Typical meteorological data is a representative data set that has been derived over a longer period and which can be considered as typical. Since a typical daily precipitation record over a longer time is not available for the project site, an approximation was applied to estimate daily average precipitation and then predict how often the detention vaults might overflow.

For this approximation, the average rainfall data for the project site was obtained from the Hawaii rainfall atlas and the typical number rain days was obtained from the NOAA website. The available rainfall data was then used in conjunction with a probabilistic model to calculate the likely rainfall occurrences.

Figure 9.1 shows the average rainfall at the project site, obtained from the Hawaii Rainfall Atlas. Figure 9.1 suggests a "wet season" from October through March and a "dry season" from April through September.

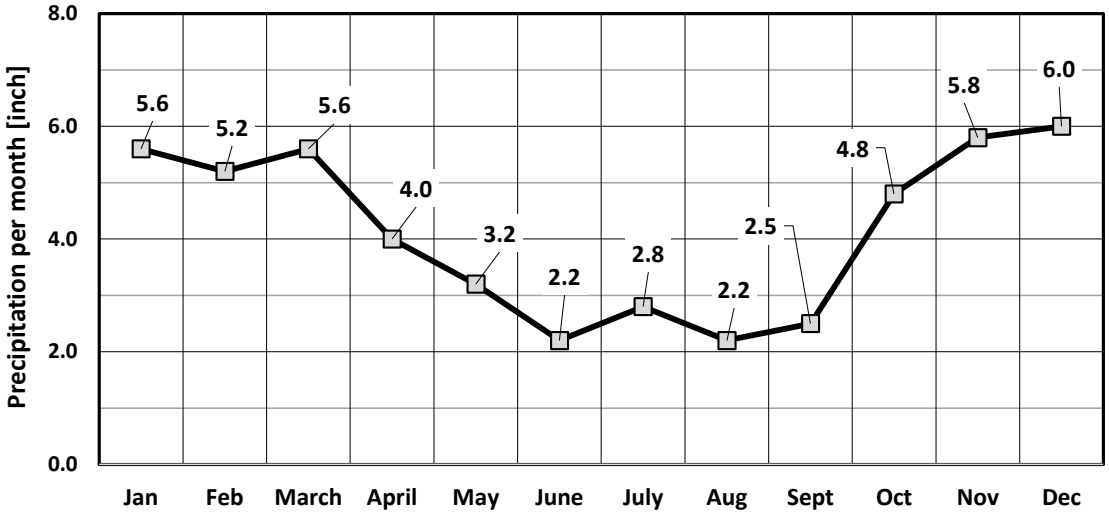

Figure 9.1: Average rainfall at the project site per month (source: Hawaii Rain Atlas)

Table 9.1 shows the results of the total amount of runoff from the entire Lower site bypassing the detention vaults.

Figure 9.2 illustrates the total amount of runoff of the entire site that is predicted to bypass the detention vaults per month. Figure 9.2 further illustrates the average number of rain days at the site. Figure 9.2 suggests that the number of rain days does not significantly change throughout the year,

while the amount of runoff changes significantly. This indicates that the rain fall intensity per rain event is higher within the wet season than during the dry season.

Table 9.1: Total amount of runoff from the Lower site which bypasses the detention vaults

Month	Drain area 1 cbft/month	Drain area 2 cbft/month	Drain area 3 cbft/month	Drain area 3 cbft/month	Sum of Drain areas 1 through 4 cbft/month	Number of average days with rainfall per month
Jan	7,400	5,500	1,200	200	14,300	13
Feb	5,200	4,000	1,000	100	10,300	13
March	7,200	5,600	1,700	400	14,900	16
April	0	0	0	0	0	16
May	0	0	0	0	0	15
June	0	0	0	0	0	15
July	0	0	0	0	0	17
Aug	0	0	0	0	0	17
Sept	0	0	0	0	0	15
Oct	0	0	0	0	0	16
Nov	8,400	6,800	2,700	900	18,800	15
Dec	12,500	10,200	4,800	1,900	29,400	14

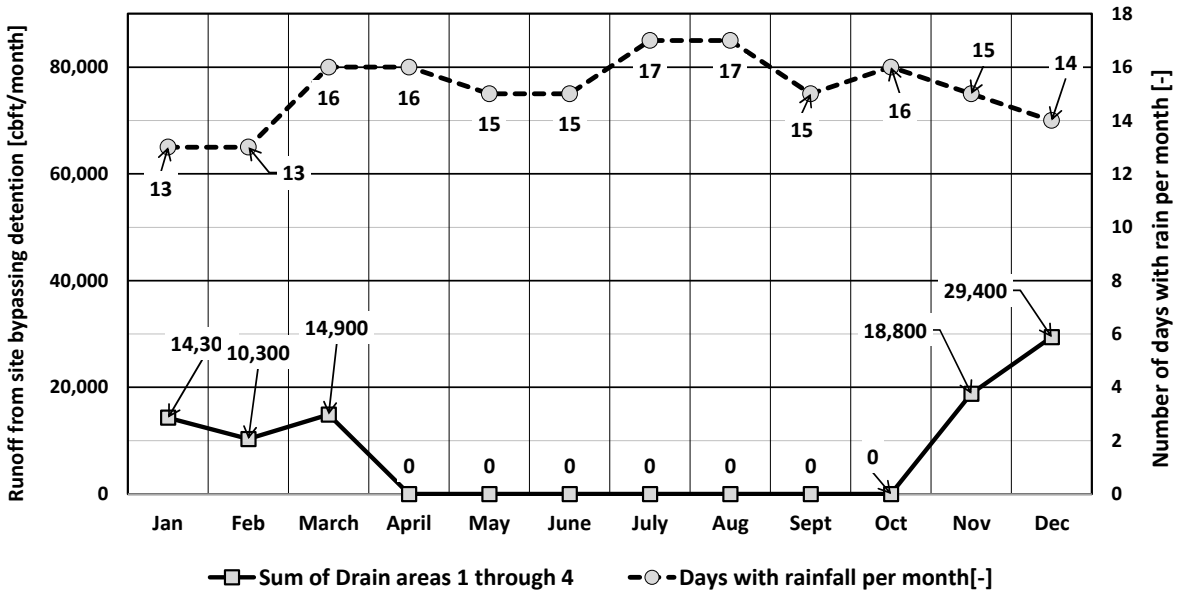

Figure 9.2: Estimate of the amount of total runoff from the project site bypassing the detention vaults

Figures 9.3 through 9.6 suggest how much of the storm water runoff could overflow the four detention vaults in the four drainage areas.

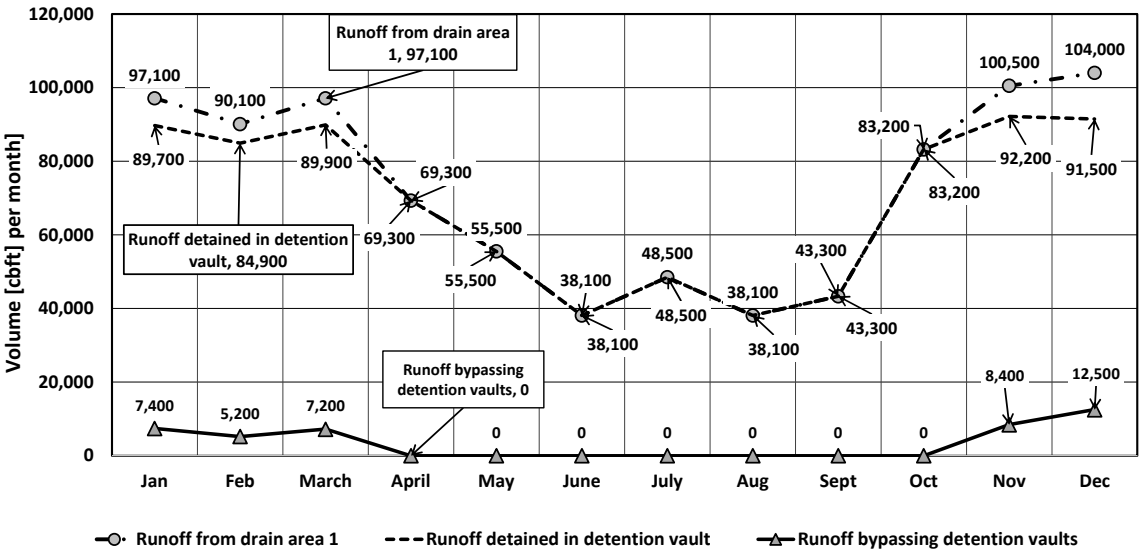

Figure 9.3: Estimate of the amount of runoff from drainage area 1 bypassing the detention vaults

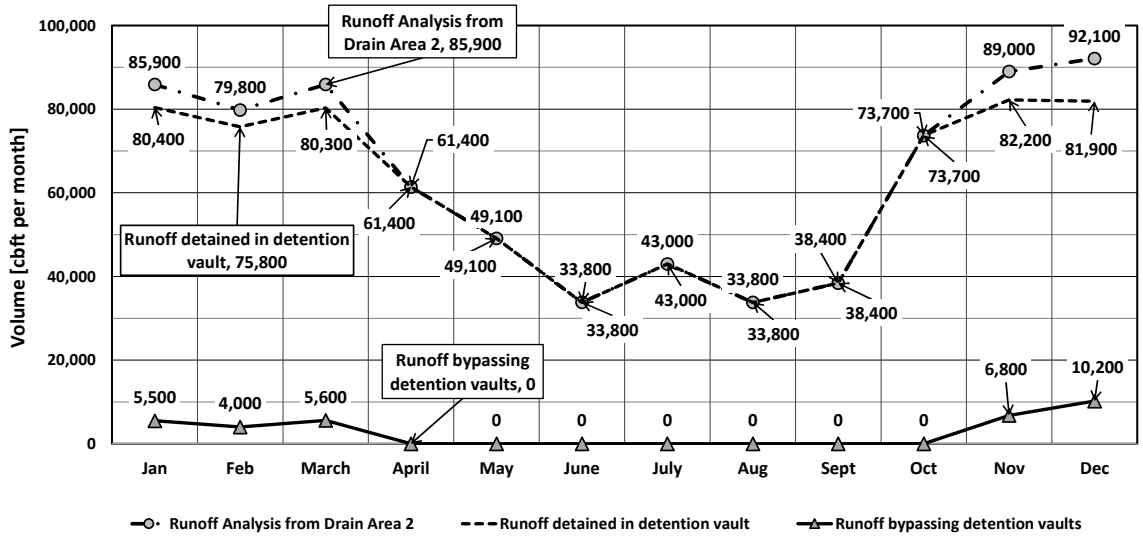

Figure 9.4: Estimate of the amount of runoff from drainage area 2 bypassing the detention vaults

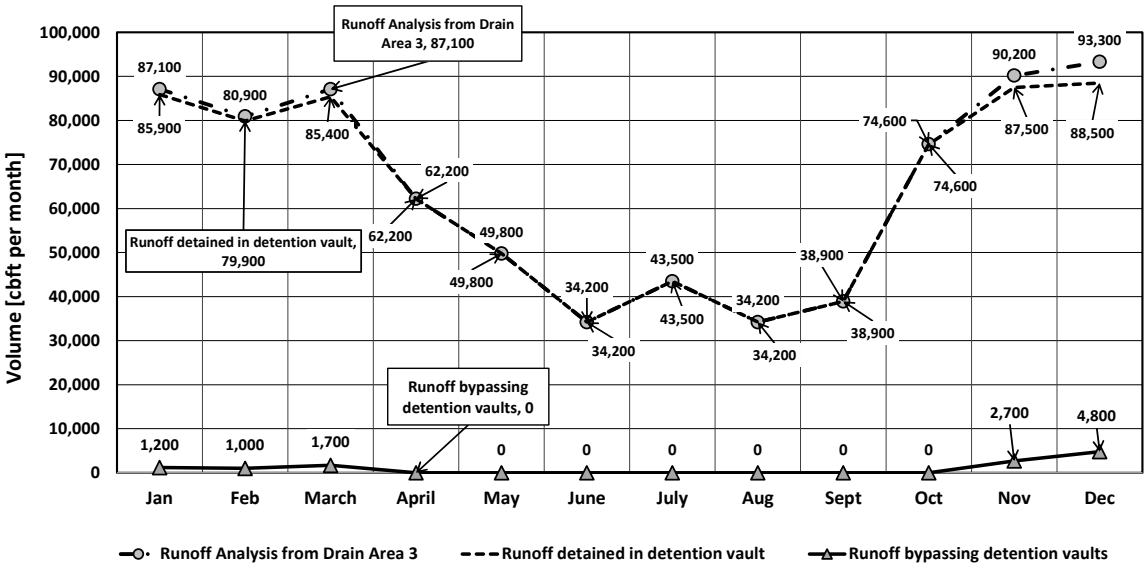

Figure 9.5: Estimate of the amount of runoff from drainage area 3 bypassing the detention vaults

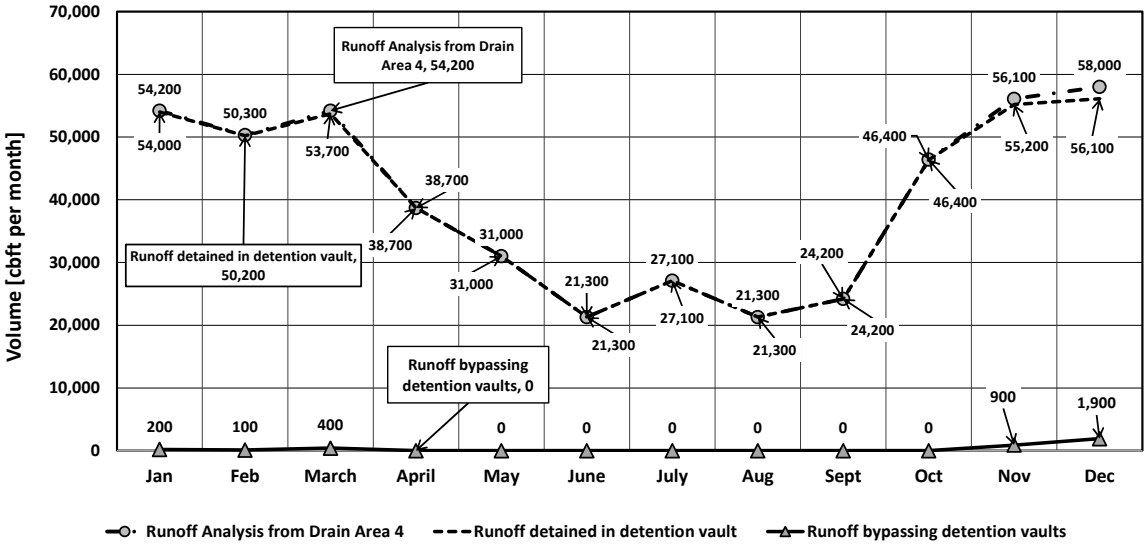

Figure 9.6: Estimate of the amount of runoff from drainage area 4 bypassing the detention vaults

Figure 9.10 shows an estimate of the annual distribution of percentage of storm water that bypasses the detention vaults and therefore does not pass through the MTD units.

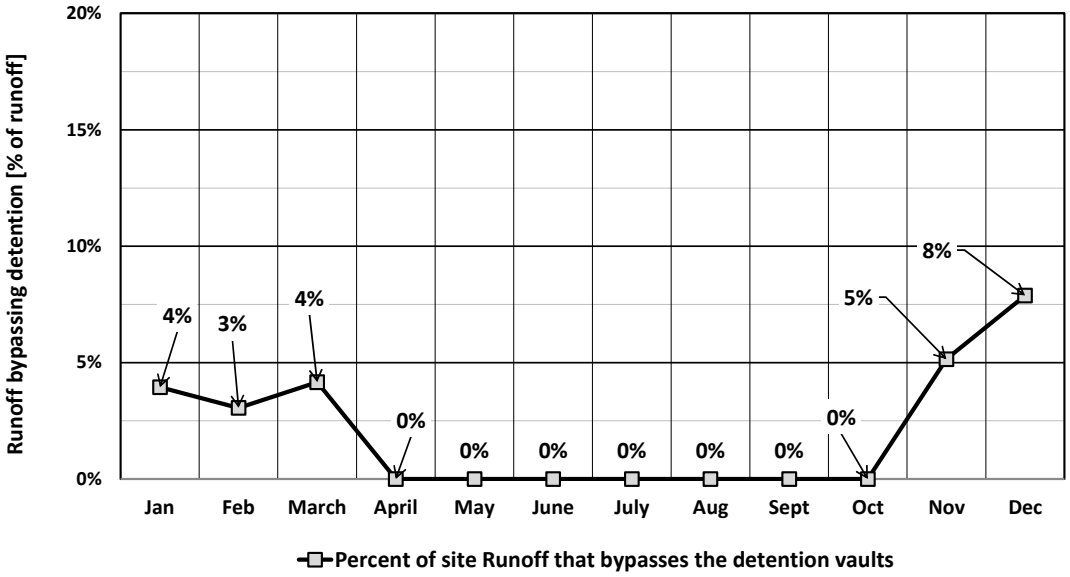

Figure 9.6: Estimate of the amount of runoff from drainage area 4 bypassing the detention vaults

Summarizing, the results of the estimate shown above suggest a <u>good detention performance efficacy for typical rain events</u>. Over the entire year the expected average percent of storm water captured in the detention vaults is 98%. During the wet season, from October to March, the average capture rate is 95%. These findings suggest that only 2% or 5% of the storm water runoff bypasses the detention as an annual average or during the wet season.

REFERENCES

DPP (2017) STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu, Prepared by City and County of Honolulu, Department of Planning and Permitting

EPA (2020) "Stormwater Discharges from Industrial Activities-Conditional "No Exposure" Exclusion", National Pollutant Discharge Elimination System (NPDES)

Wong, T., et al. (2002) "A model for urban stormwater improvement conceptualization", Global Solutions for Urban Drainage (2002): 8-13.

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Appendix D:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

RELATIONSHIP OF FINISH GRADE AND STORM WATER SYSTEM (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop the Proposed

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix D

Required Increases of Finish Grade to Implement Storm Water Treatment and Management system

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

BMP	Best Management Practices
DPP	City and County of Honolulu, Department of Planning and Permitting
LID	Low Impact Development
MTD	Manufactured Stormwater Treatment Device
ROH	Revised Ordinances of Honolulu
WQ	Water Quality
Lower site	Lower portion of the project site in TMK 4-2-15:014
Upper site	Upper portion of the project site in TMKs 4-2-15:013 and 014

SUMMARY AND FINDINGS

Following the review of the Draft SEIS the following comments were received: The City and County of Honolulu, Department of Planning and Permitting (DPP) stated that selected buildings planned to be built on the proposed finish grade in the lower portion of the project site (Lower site), would exceed the 40-foot height limit allowed in the I-1 (Limited Industrial) zoned land. The basis for the comments is that in accordance with the Revised Ordinances of Honolulu (ROH) the 40-foot height limit is measured from the existing grade if the site has received fill. This is the case for the Lower site.

Discussion:

The applicable ROH conditions allow exemptions if site development constraints require fill to install important infrastructure, such as site drainage. This condition is present in the Lower site and therefore the 40-foot rule should not be applied with reference to the existing grade.

Significant mitigation of storm water related impacts is of a primary concern for the project site to protect aquatic resources. To provide superior storm water impact mitigation for the Lower site, a comprehensive storm water treatment and management system is planned that utilizes different storm water treatment train concepts, composed of components for flood control and storm water pollution removal.

The functioning of the comprehensive storm water treatment and management system requires that sufficient hydraulic flow energy be available to overcome the hydraulic losses, thus, to move the storm water runoff though the components of the system. The required hydraulic flow energy is provided by a sufficient elevation difference between the farthest drain inlet and the outlet of the runoff to the Kapa'a Stream corridor. As the calculations presented in this paper show, the hydraulic losses of the storm water treatment and management in the four drainage areas of the Lower site are between 22.5 and 24 feet. The required elevation difference can only be achieved by increasing the elevation of the proposed finish grade over the existing grade accordingly.

This report shows that the proposed finish grade will be required to install the comprehensive storm water treatment and management system. Therefore, the applicable 40-foot heigh limit delineated in ROH chapter 21 needs to measure the building heights in the Lower site from the proposed finish grade and not the existing grade.

SECTION 1: BACKGROUND AND REQUIREMENT OF INCREASED FINISH GRADE

Responses to the Draft SEIS pointed out that the heights of the proposed buildings in the Lower site were exceeding the 40-foot height restriction in the I-1 zoned parcel of the Lower site, relative to the existing grade.

Specifically, the response by the Department of Planning and Permitting reads:

> *Page 260 shows proposed buildings reaching about 50 feet in height from existing grade. The lower portion of the site is subject to the I-1 Limited Industrial height limit of 40 feet, as measured from existing or finished grade, whichever is lower.*

The ROH 21 Article 4. General Development Standards Section 21.-4.60 states:

Sec. 21-4.60 Heights.

(a) All structures shall fall within a building height envelope at a height specified by this chapter or as specified on the zoning maps. Exceptions are specified under subsection (c), and others may be specified under special districts.

(b) The building height envelope shall run parallel to existing or finish grade, whichever is lower (see Figure 21-4.3), **except where finish grade is higher than existing grade to meet city construction standards** for driveways, roadways, **drainage**, sewerage, and other infrastructure requirements, or to meet conditions of permits approved under the provisions of this chapter. In these cases, height shall be measured from finish grade.

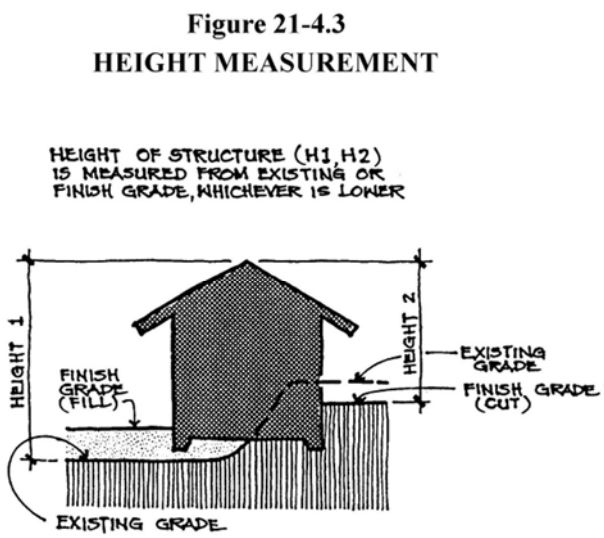

Figure 21-4.3: Height measurements

Source: Revised Ordinances of Honolulu (ROH) Section 21-4.60

Note: Figure number is the ROH figure number

The subsequent sections will describe that that the required storm water treatment and management system in the Lower site can only be built and operated if the finish grade is increased to the proposed elevations.

SECTION 2 - EXISTING VERSUS PROPOSED FINISH GRADE IN THE LOWER SITE

Figure 2.1 shows a recent topographic rendering of the existing grade within the lower site. The contour lines indicate that the existing grade shows an elevation gradient towards the North-East corner of the site. The elevation drop from the South -West to the North-East corner of the proposed development site is approximately 35 feet. The average slope of the site as shown is 2.5%.

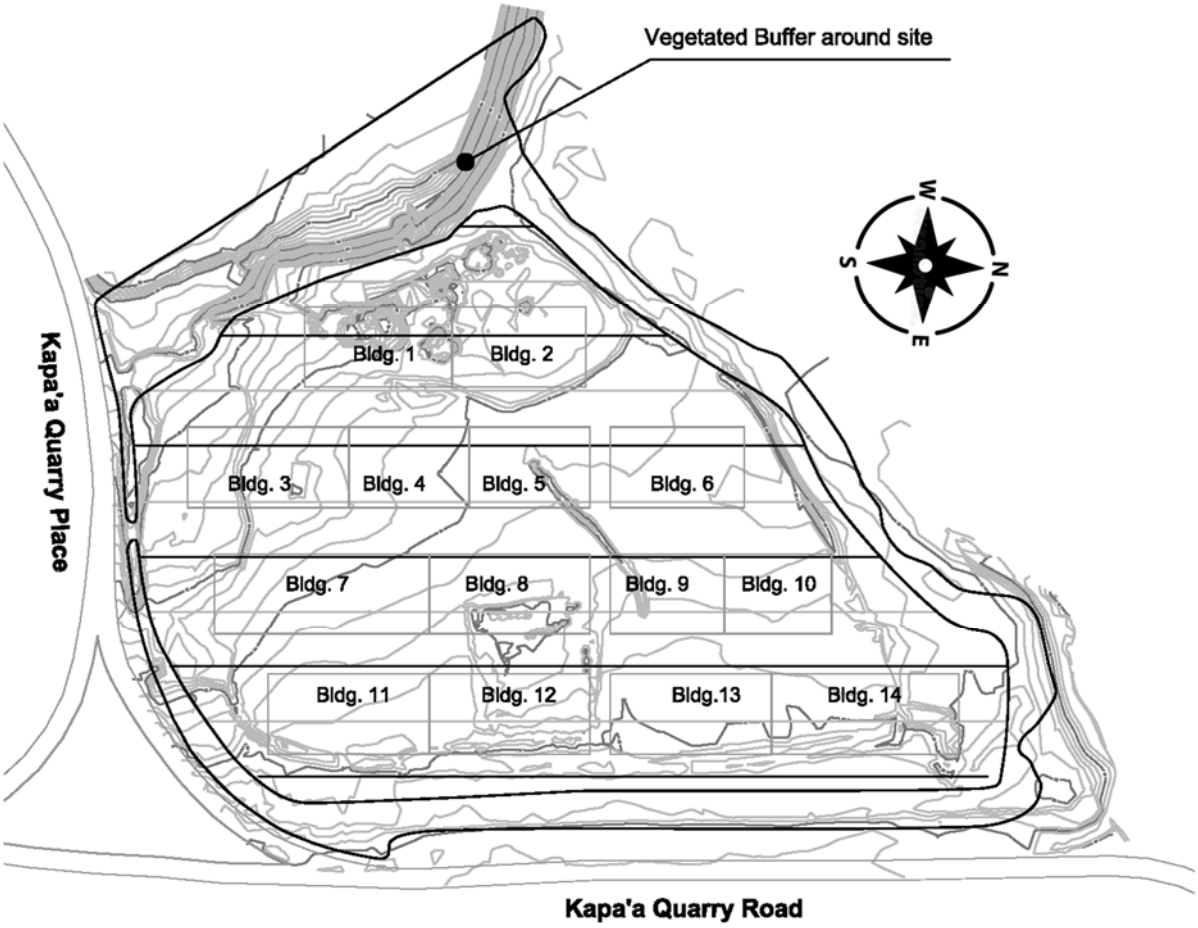

Figure 2.1: Existing grade within the Lower site

Figure 2.2 shows the proposed finish grade. The contour lines will run in the North-South direction. The 14 new buildings will be constructed parallel to the contour lines. The uniform slope in the West-East direction is 0.9%. The total elevation drop in the West to East direction is about 10 feet. There is no elevation drop in the South-North direction, thus the elevations along the longitudinal extent of the buildings remain constant, facilitating the construction and operations of the buildings.

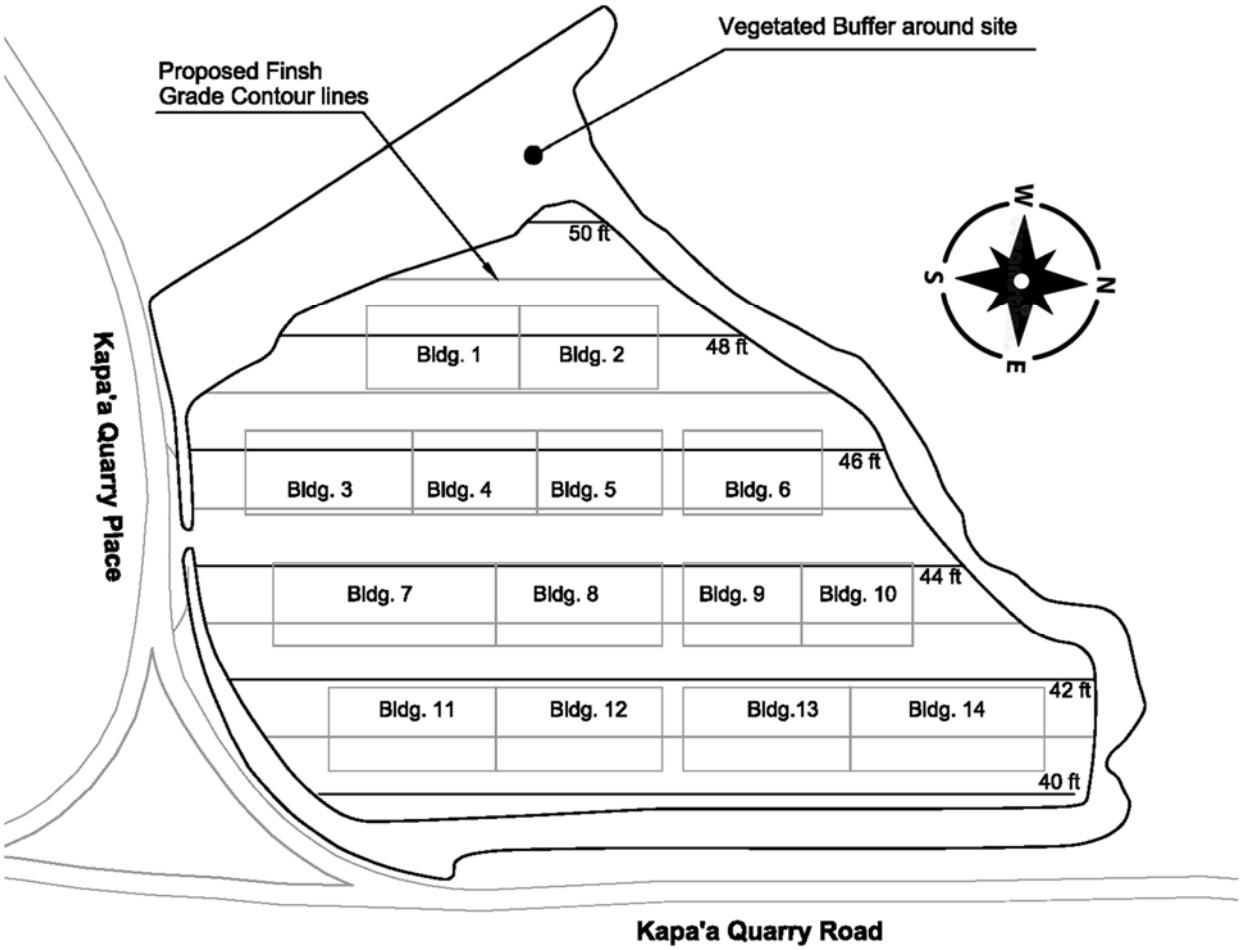

Figure 2.2: Proposed finish grade within the Lower site

For the subsequent discussion, the drainage system of the Lower site must be considered. Figure 2.3 A through D shows the four drainage areas of the Lower site. The numbering of the drainage areas from 1 through 4, with drainage areas 1 and 4 starting at the Western and eastern site perimeter, respectively.

The subsequent discussion of the required finish grade in relation to the stormwater treatment and system drainage uses elevation cross sections that illustrate the representative existing and proposed finish grade elevation in each of the four drainage areas in the Lower site. Figure 2.4 3 shows the location of the four elevation sections. The four elevation sections are located on the axes of the drainpipes within the four drainage areas of the Lower site. These drainpipes will run from the South to the North site perimeter.

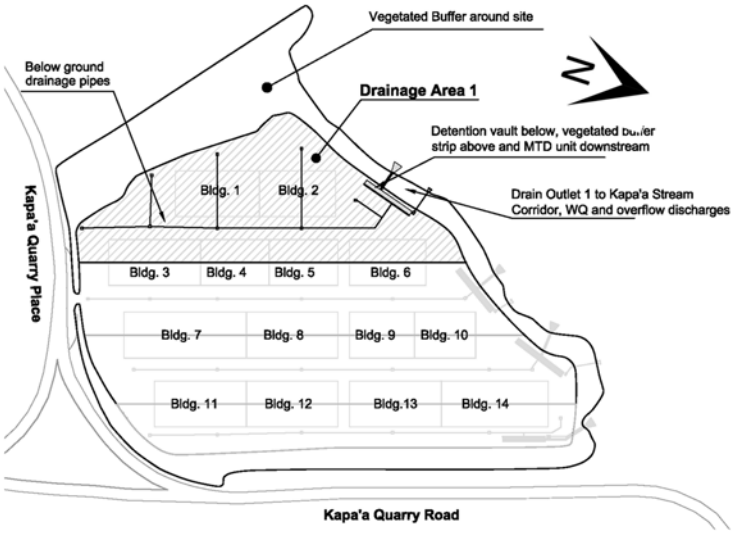

Figure 2.3 A: Drainage area 1 in the Lower site

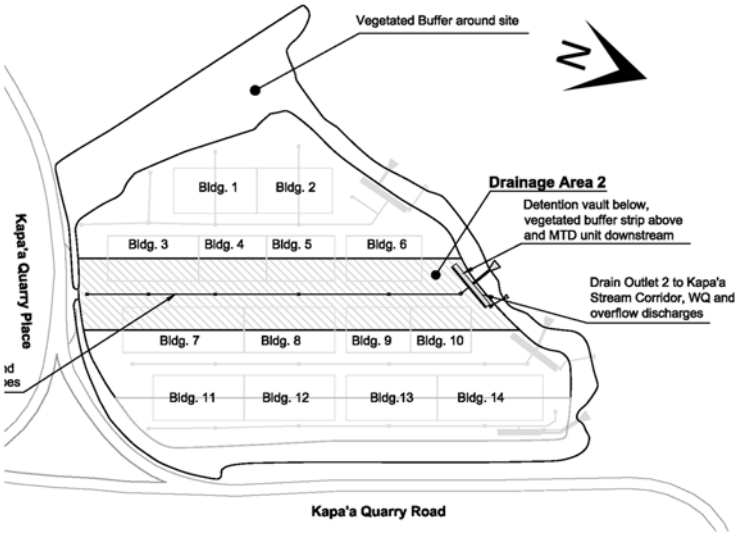

Figure 2.3 B: Drainage area 2 in the Lower site

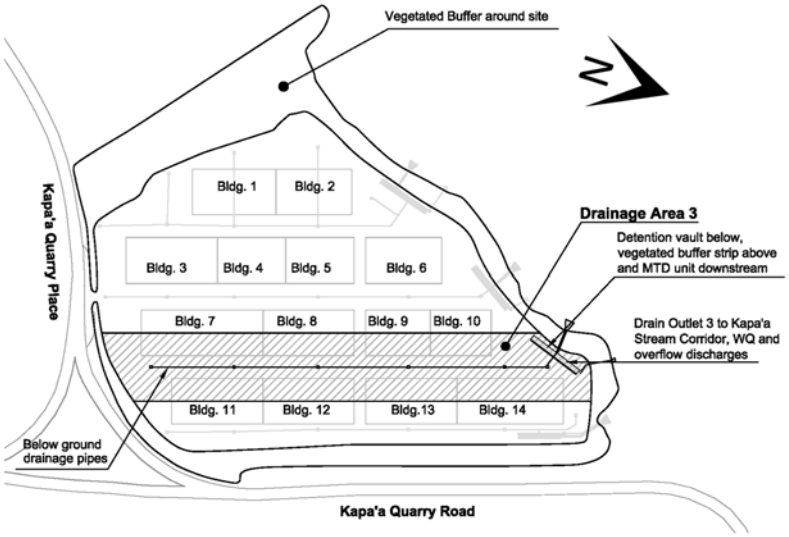

Figure 2.3 C: Drainage area 3 in the Lower site

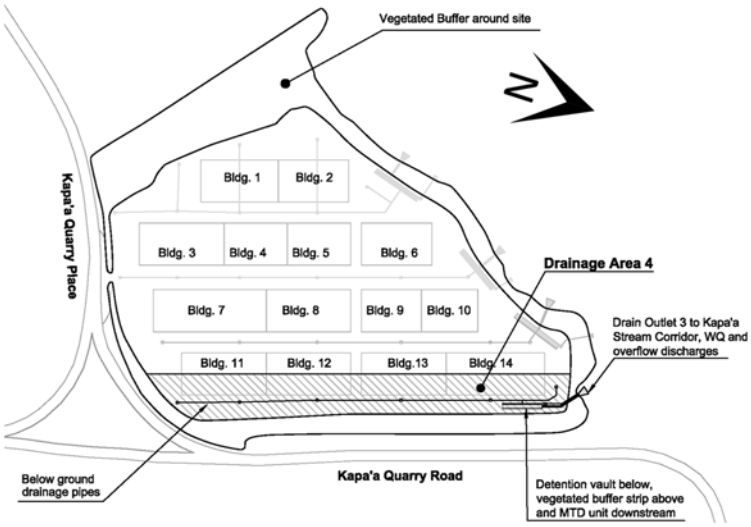

Figure 2.3 D: Drainage area 4 in the Lower site

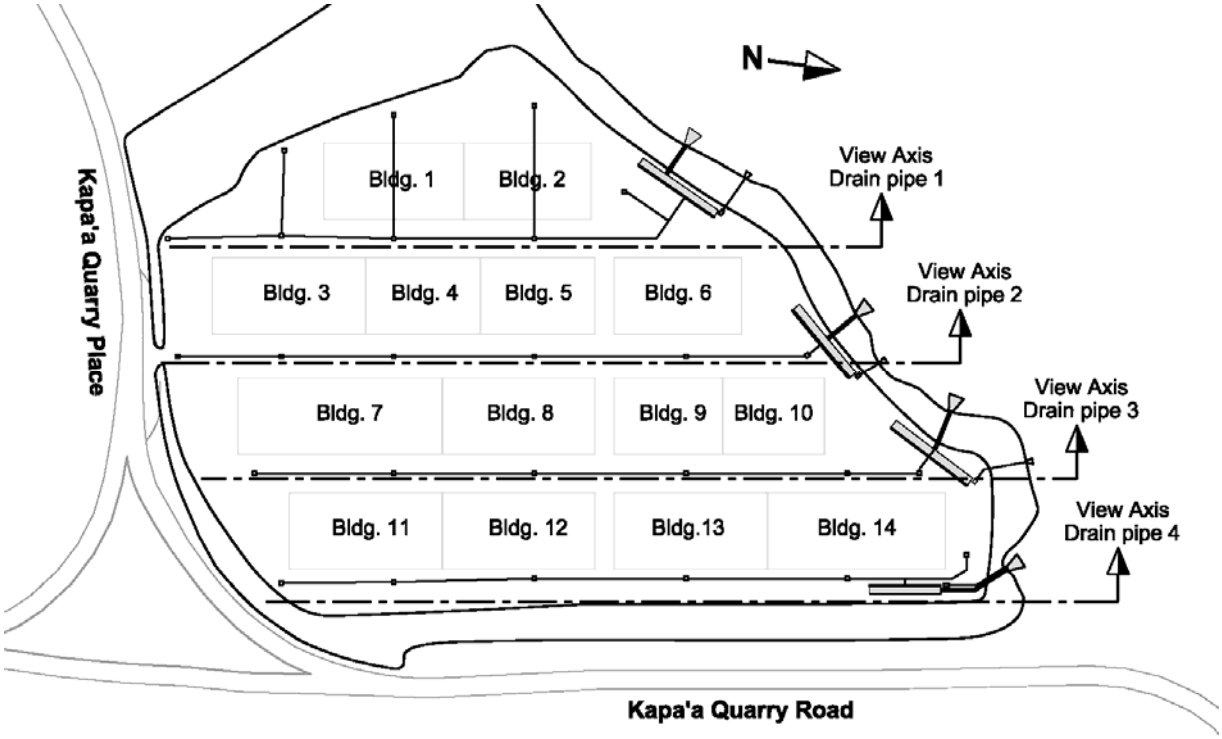

Figure 2.4: Locations of the elevation section

Figures 2.5 through 2.8 show the four elevation section of the existing and proposed finish grade along the axes of the drainpipes for the, with building numbers indicated. The building height is assumed as 35 feet, which is under the allowable building height of 40 feet. Each elevation section indicates the buildings that are nearest upslope from the axes of the elevation section.

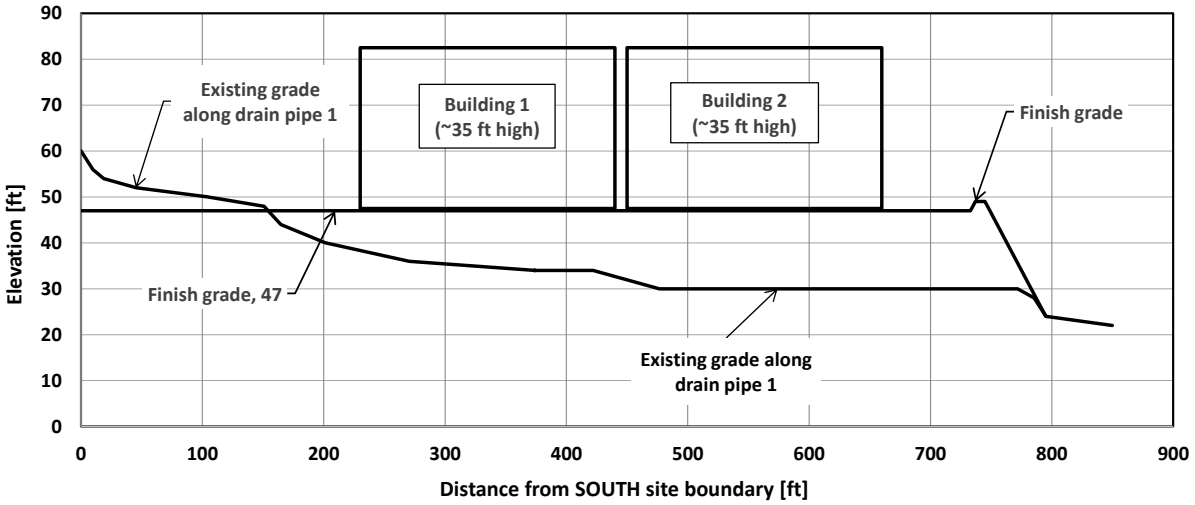

Figure 2.5: Elevation section with existing and proposed finish grade for the View Axis of Drainpipe 1

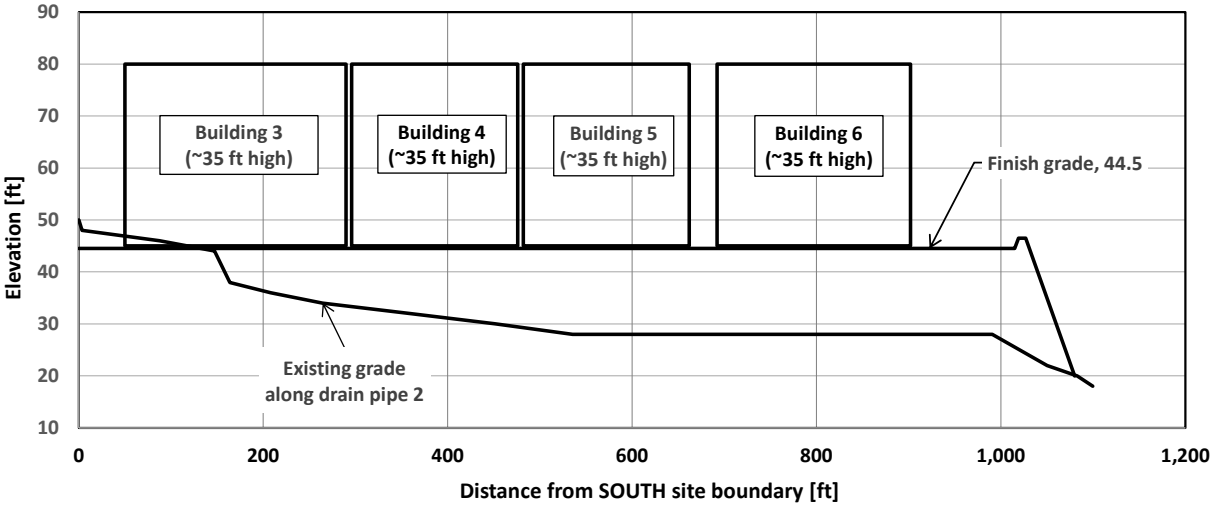

Figure 2.6: Elevation section with existing and proposed finish grade for the View Axis of Drainpipe 2

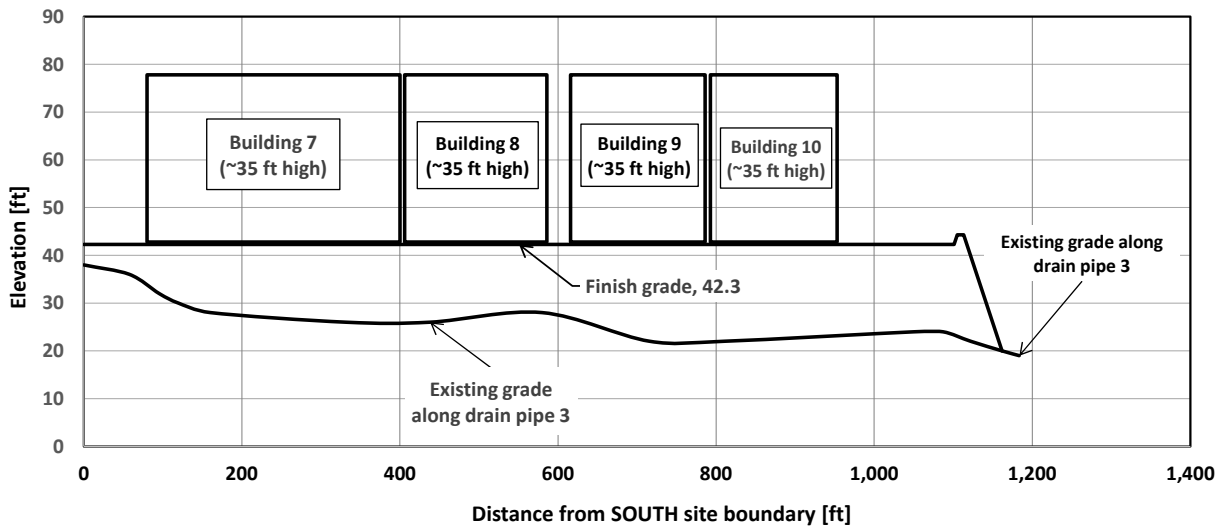

Figure 2.7: Elevation section with existing and proposed finish grade for the View Axis of Drainpipe 3

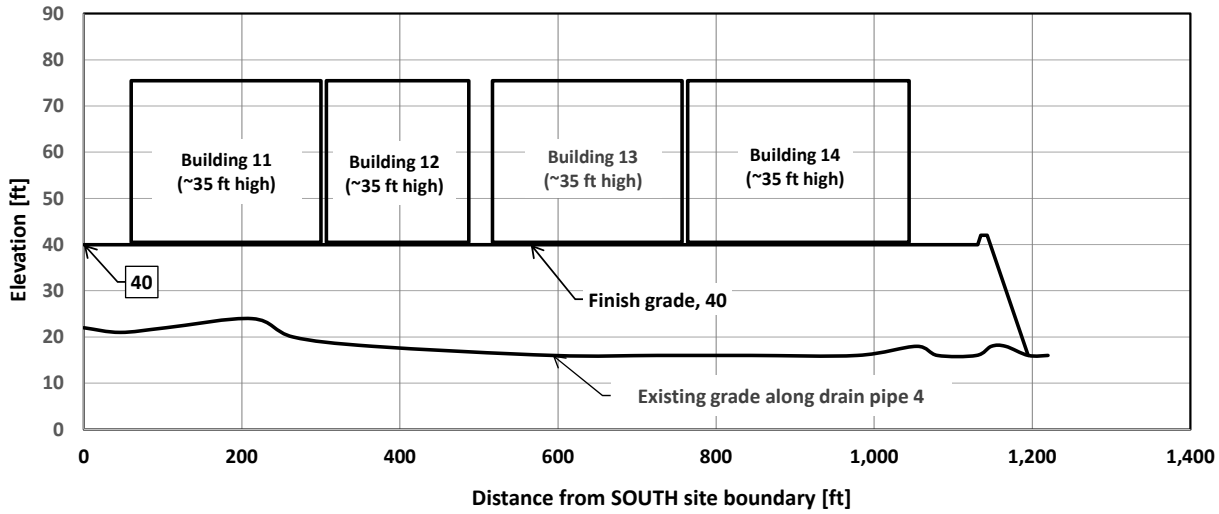

Figure 2.8: Elevation section with existing and proposed finish grade for the View Axis of Drainpipe 4

SECTION 3 - STORM WATER SYSTEM IN THE LOWER SITE

Figure 3.1 shows the schematics of the storm water treatment train which will be used for each of the four drainage areas in the Lower site. Table 3.1 explains the different components (A) through (G) of the storm water treatment train which are indicated in Figure 3.1.

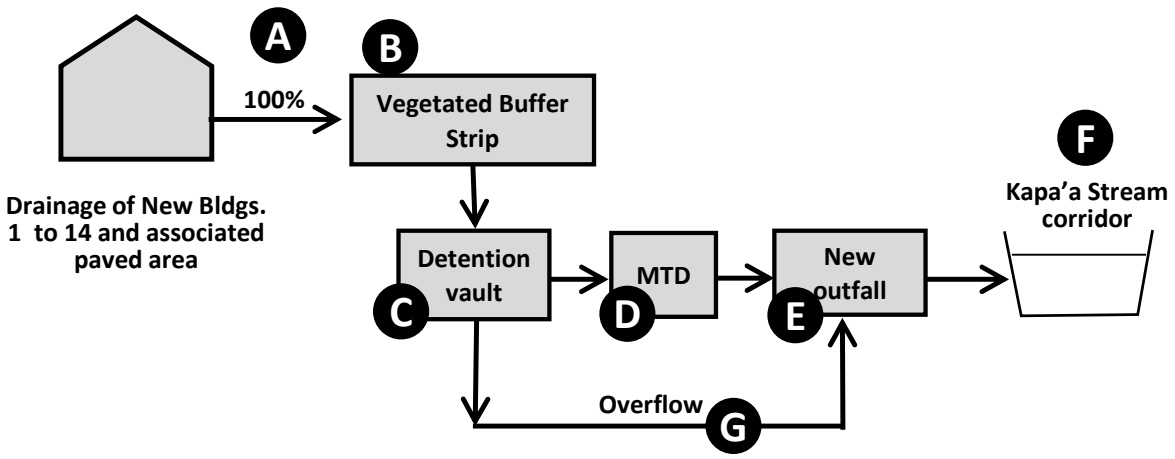

Figure 3.1: Strom water treatment train used for all 4 drainage areas in the Lower site

ID	Description of components of treatment train
(A)	One hundred percent (100%) of the storm water runoff from the drainage area is captured in the drainpipes. The drainpipe starts at the first drain inlet close to the Southern site perimeter and ends at the inlet to the treatment facilities which is located at the Northern site perimeter. Several drain inlets along the length of the drainpipe collect runoff and feed the runoff into the drainpipe. All drain inlets have debris collecting screens which hold back coarse settleable and floatable debris that passes through the inlet grating. The drainpipes need a certain slope to provide the required hydraulic flow energy.
(B)	The first treatment component is the vegetated buffer strip. All of the runoff that exists in the drainpipe will flow through the vegetated buffer strip, where initial treatment of runoff occurs.

ID	Description of components of treatment train
(C)	After passing through the vegetated buffer zone the runoff enters below ground detention vaults. The detention vaults collect and store the runoff volume. When the detention vault is filled to capacity, the flow is diverted to the overflow pipe (G).
(D)	The detained water in the detention vaults is released over a longer period, typically 24 to 36 hours, to shave off peak flow rates. The released flow passes through the manufactured treatment device (MTD). The type of MTD unit used at the project site is a filtration unit, which requires a certain hydraulic head to force the water through the filter elements.
(E)	There are two types of outfalls: 1. A small outfall structure serves the flow that is released from the MTD. This outfall is referred to as the WQ outfall. 2. A larger outfall structure ("peak outfall") serves the overflow of the detention vault. This outfall will have to accommodate a larger flow rate that corresponds to the assumed peak flow rate (e.g., the 50-year storm event). Since the flow rate is large, energy dissipation devices and a riprapped distribution area will be incorporated into the outfall structure. The WQ outfall will be located at a lower elevation than the peak outfall structure.
(F)	The water that is released to the Kapa'a Stream corridor will typically be distributed on vegetated and permeable land upstream of the stream bed, and not directly into the stream bed. Therefore, a portion of the water released into the Kapa'a Stream corridor would infiltrate and not directly add to the flow in the stream.
(G)	The overflow of the detention vault bypasses the detention vaults and the MTD units. The overflow is carrying flow during peak flow events.

Previous flow analysis has determined that the expected flow through the detention and MTD unit represents between 95% to 98% of the flow during the wet season and on an annual basis, respectively. Therefore, for most of the storm events water would be discharged through the WQ outfall.

SECTION 4 - LOSSES ALONG THE STORM WATER TREATMENT TRAIN

Hydraulic losses are incurred as the runoff passes through the different components of the storm water treatment train, or drainage system, for each of the four drainage systems in the Lower site. The sum of all losses along one treatment train must cannot be larger than the elevation differential between the elevations of the farthest drain inlets and the elevation of the WQ outlet at the perimeter of the Kapa'a Stream corridor.

This section analyses the hydraulic losses within the drainage system and determines if the proposed elevation of the finish grade provides the sufficient elevation difference. A sufficient elevation drop between intake and outfall is required to support the design flow through the drainage system.

Table 4.1 shows the description and values of the hydraulic losses (A) through (G) which will be incurred by the different components of the drainage and treatment systems of the four drainage areas 1 through 4 in the Lower site.

Table 4.1: Description and values of the hydraulic losses (A) through (G)

Losses ID	Description of losses in the drainage process	Drainage areas in Lower site							
		Drainage area 1		**Drainage area 2**		**Drainage area 3**		**Drainage area 4**	
		data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]
Losses (A)	**Elevation loss in drain inlet**		3.5		3.5		3.5		3.3
	Invert below finish grade	3.5		3.5		3.5		3.5	
Losses (B)	**Elevation losses in drain pipe**		5.0		6.4		5.2		5.6
	Drain pipe length:	900		1060		1,030		1,010	
	Drain pipe slope:	0.55%		0.60%		0.50%		0.55%	
Losses (C)	**Elevation losses in vegetated buffer strip**		2.9		2.8		2.7		2.7
	Losses include distribution loss, entry loss, loss of flow through the buffer, exit loss to collection								
Losses (D)	**Elevation losses in detention vault**		6.5		6.5		6.5		6.5
	Losses include inlet losses, elevation of detention vault to empty completely, exit losses								
Losses (E)	**Elevation losses pipe to MTD**		0.7		0.8		0.8		0.8
	Losses from connection pipe to MTD								
Losses (F)	**Elevation losses in MTD**		3.0		3.0		3.0		3.0
	Losses in MTD include entry losses, losses from hydraulic head above filters, exit losses								
Losses (G)	**Elevation losses from MTD to outfall point**		1.6		1.1		0.9		1.1
	Losses include entry losses, flow losses, losses due to energy dissipation (riprap)								
	Sums of elevation losses along drainage process flow		**23.1**		**24.1**		**22.5**		**22.9**
	Finish grade at the start of the drainage process flow		**47**		**44.5**		**42.3**		**40**
	resulting elevation at WQ discharge invert at site perimeter		**23.9**		**20.4**		**19.8**		**17.2**
	Approximate elevation of existing grade in Kapa'a Stream corridor		**24**		**20**		**20**		**17**

Figures 4.1 through 4.4 illustrates the losses described and quantified in Table 4.1 for the drainage areas 1 through 4 in the Lower site. In these figures the dashed lines indicate the proposed finish grade, the solid grey line on the right represents the existing grade in the Kapa'a Stream corridor and the solid black line indicate the representative hydraulic losses, in feet, that are incurred, as the runoff flows through the drainage systems.

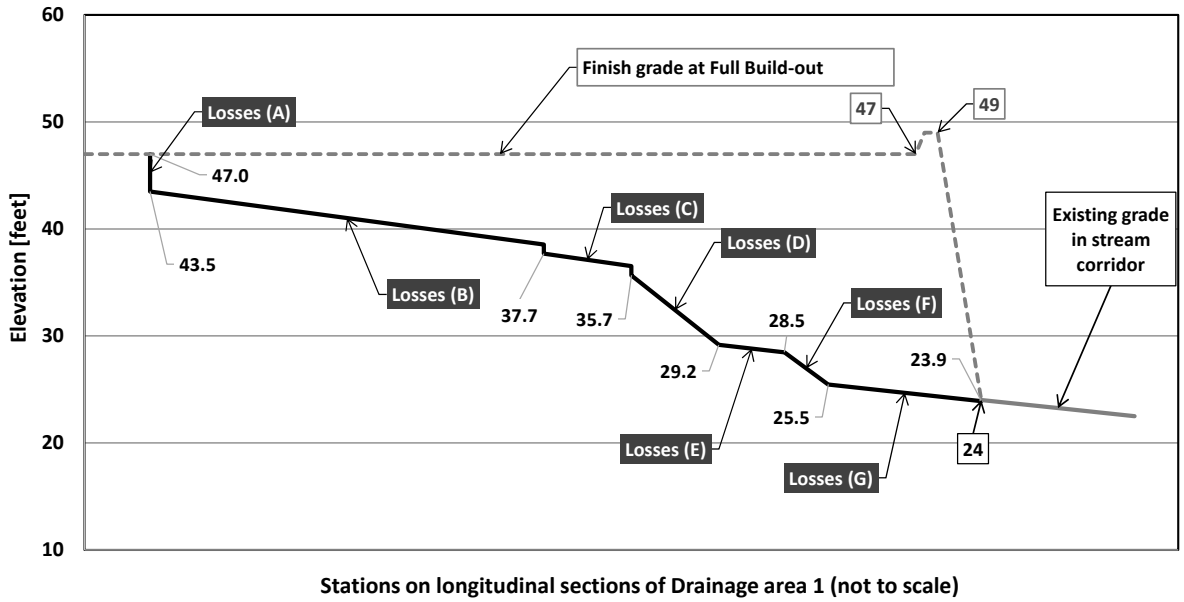

Figure 4.1: Hydraulic flow losses in drainage and treatment system for Drainage Area 1

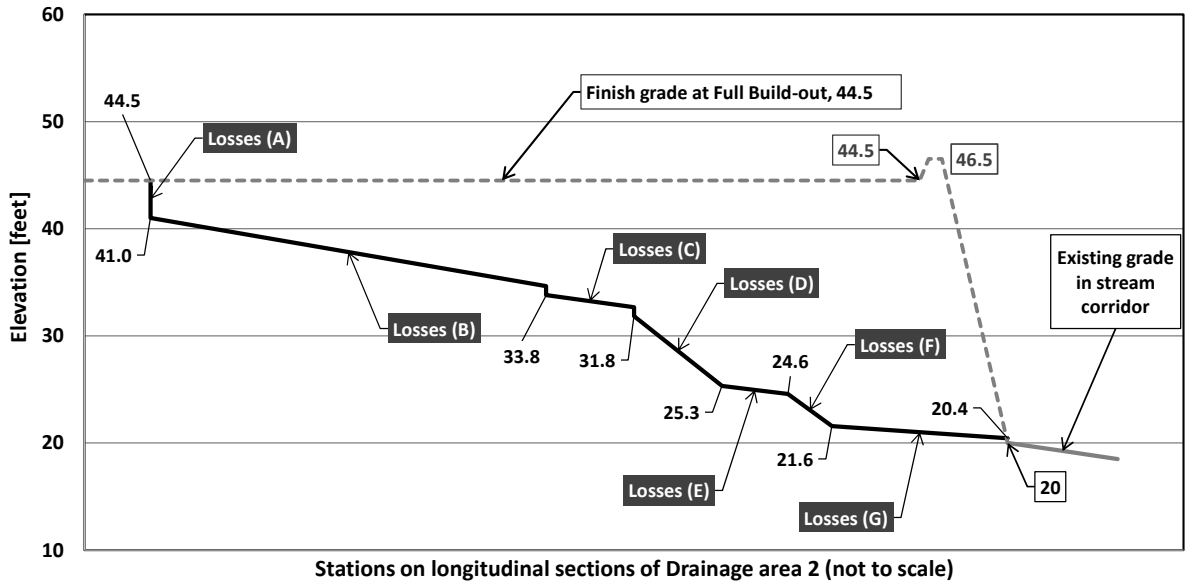

Figure 4.2: Hydraulic flow losses in drainage and treatment system for Drainage Area 2

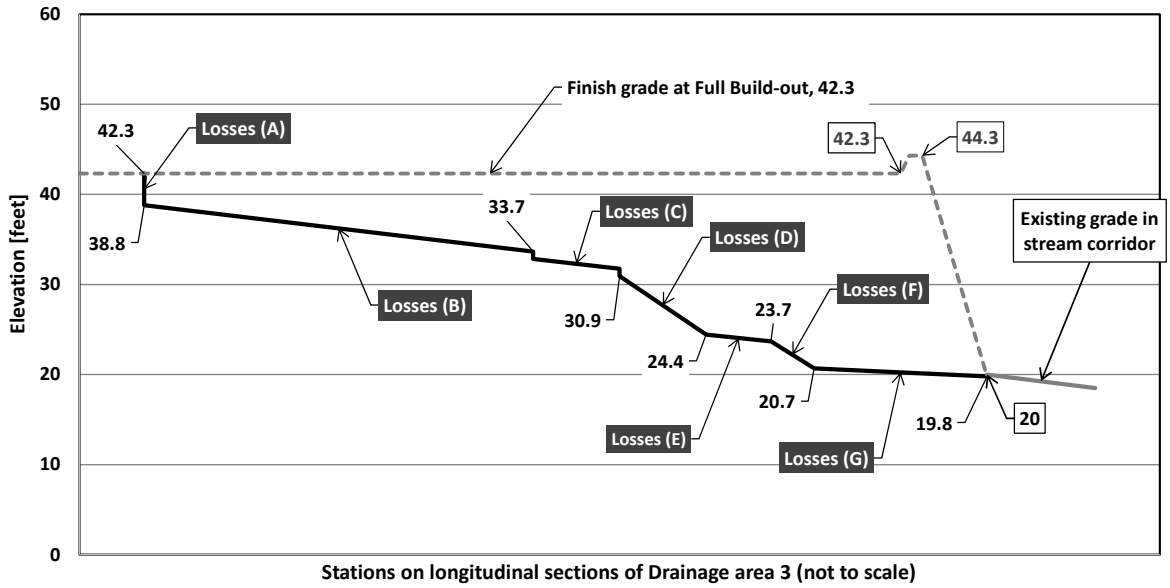

Figure 4.3: Hydraulic flow losses in drainage and treatment system for Drainage Area 3

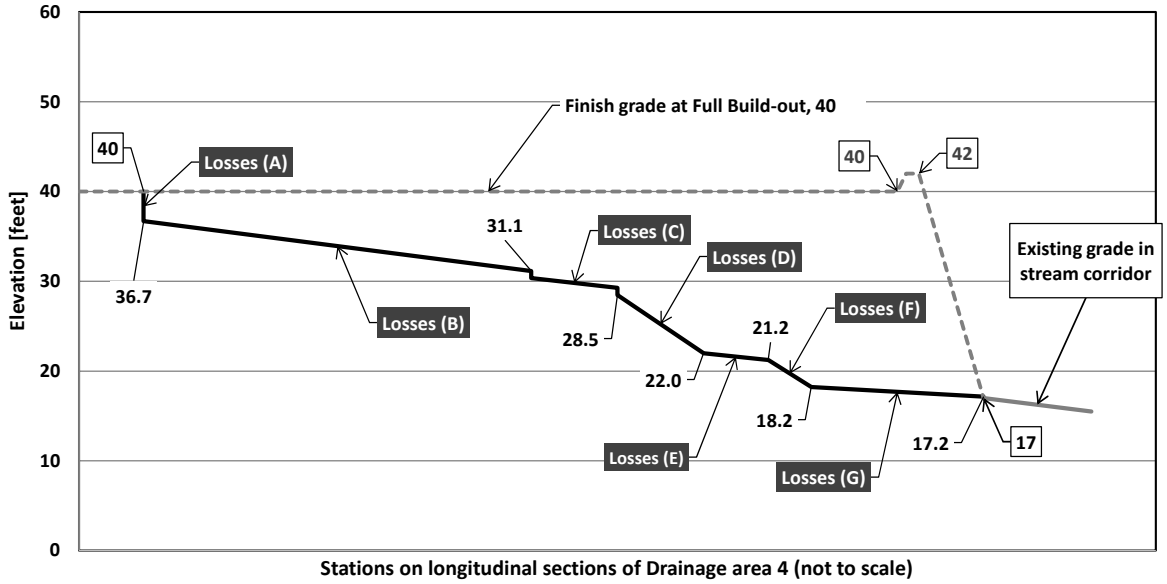

Figure 4.4: Hydraulic flow losses in drainage and treatment system for Drainage Area 4

Figures 4.1 through 4.4 indicate that the proposed finish grade will provide sufficient elevation differential to create the required hydraulic flow energy to drive the runoff through the drainage and treatment system. The figures indicate the small margins between the WQ outlet elevation and the elevation of the existing grade at the perimeter of the Kapa'a Stream corridor. This indicates that the proposed finish grade is the minimum grade by which the site elevation must be increased.

SECTION 5 - DEPICTION OF RESULTING STORM WATER SYSTEM USING THE PROPOSED FINISH GRADE

Figures 5.1 through 5.4 depict the existing grade and the proposed finish grade in relationship with the elevation gradient of the storm water drainage and treatment system, for each of the four drainage areas.

The vertical scale is exaggerated relative to the horizontal scale to facilitate the depiction of the elevations.

The depiction of the storm water drainage and treatment system line shows the sloped drainpipe (drainpipe axis) followed by the treatment component vegetated buffer strip, detention vault and MTD unit. The vegetated buffer strip and the detention vault are shown as one symbol, with the elevation drops of these two components added.

The location of the "Outfall to Kapa'a Stream corridor" indicates the location and elevation of the WQ outfall that releases the treated storm water runoff to the Kapa'a Stream corridor.

In Figures 5.1 to 5.4, buildings associated with the views are not depicted.

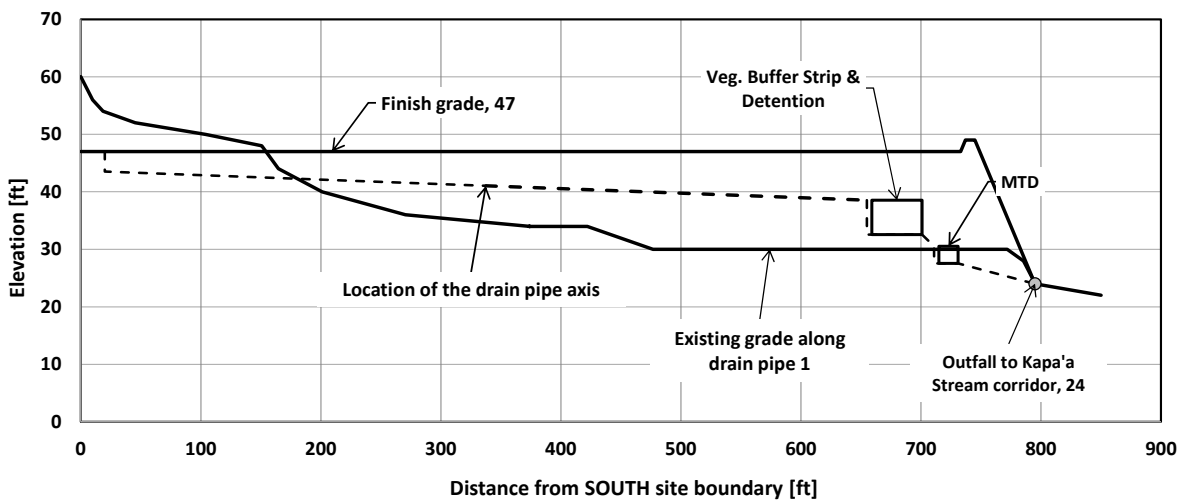

Figure 5.1: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 1

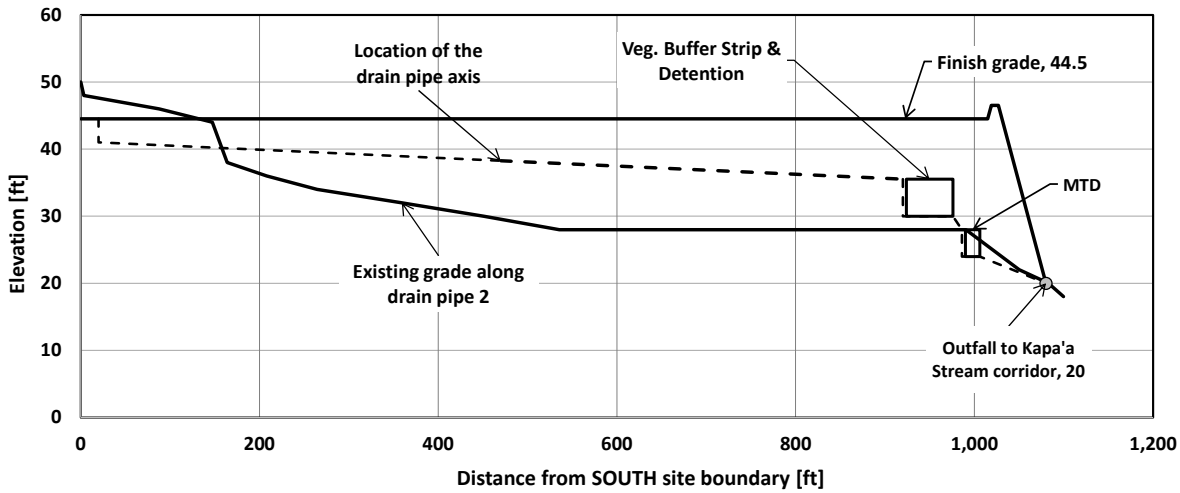

Figure 5.2: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 2

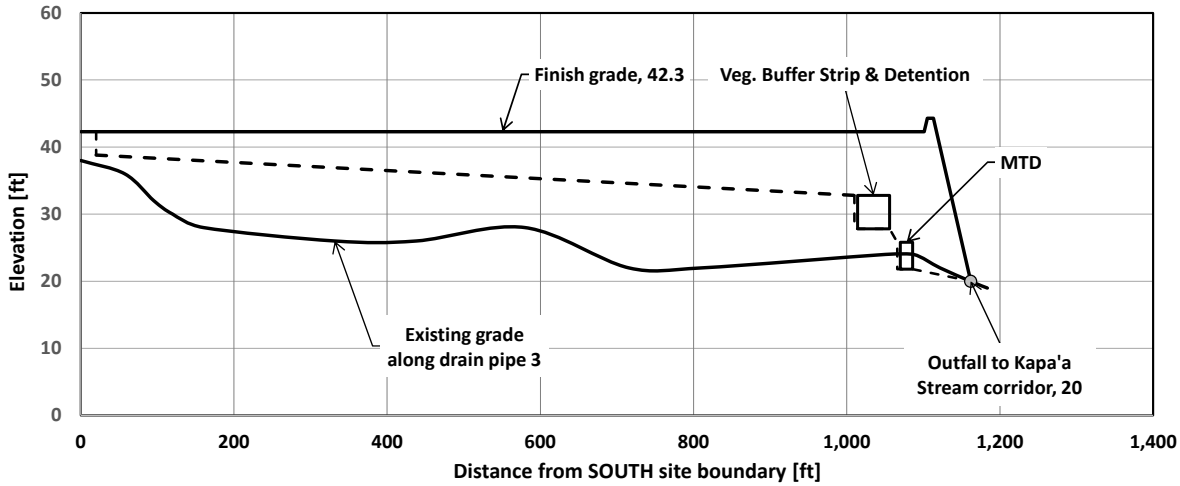

Figure 5.3: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 3

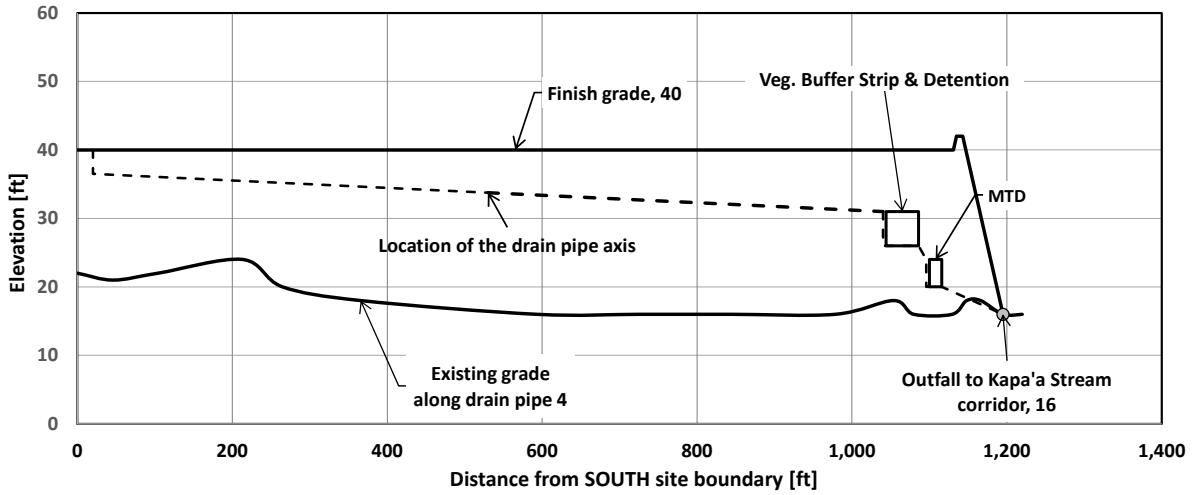

Figure 5.4: Relationship of elevations for existing grade, proposed finish grade and storm water system along the axis of the drainpipe 4

REFERENCES

Revised Ordinances of Honolulu (ROH) Chapter 21 LAND USE ORDINANCE, Article 4. General Development Standards

Appendix E:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

PRELIMINARY O&M PLAN FOR STORM WATER BMPS (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix E

Preliminary Operation and Maintenance Guidelines

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

BMP	Best Management Practices
DPP	City and County of Honolulu, Department of Planning and Permitting
KLIP	Kapa'a Light Industrial Park
LID	Low Impact Development
MTD	Manufactured Stormwater Treatment Device
ROH	Revised Ordinances of Honolulu
WQ	Water Quality
Lower site	Lower portion of the project site in TMK 4-2-15:014
Upper site	Upper portion of the project site in TMKs 4-2-15:013 and 014

SECTION 1: OVERVIEW

This Draft Operations and Manual provides preliminary information about the expected inspections and maintenance tasks required for the operation of the stormwater system at the Lower site.

The information presented hereafter are of a generic type and specific manufacturer recommendations might deviate once the specific product will be selected and installed.

Sections 2 through 7 describe the types of structural BMPs that are planned for the project site. The function of these BMPs is to remove storm water pollutants from the runoff.

Section 8 presents a list of measures for storm water pollution prevention that are used at the existing building within the Upper site and are also planned for new buildings in the Upper and Lower site to satisfy the conditions of a NPDES No Exposure certification.

Table 1.1 shows where the listed BMPs and source control measures are and will be used and in which sections they are described.

Section	Description	Used in Upper site	Used in Lower site
2	MTD – Generic a guidelines	X	X
3	Infiltration Basin	X	
4	Detention Basin	X	
5	Vegetated Buffer Strip	X	X
6	Rainwater Harvesting Vaults	X	X
7	Belowground Detention modular tanks		X
8	Source control measures used to maintain the NPDES No-Exposure Certification	X	X

SECTION 2: MTD – GENERIC AND GENERAL GUIDELINES

The following inspection and maintenance procedures apply to a type of MTD already in use at the upper portion of the project site. This type of MTD used is a filtering device, where hydraulic head is applied to pass water through a media filter.

The following inspection and maintenance procedures can be regarded as generic procedures applicable to a filter MTD.

Generic inspection and maintenance guidelines:

With all stormwater BMPs, inspection and maintenance on the MTD is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies.

It is recommended that inspections be performed multiple times **during the first year** to assess the site-specific loading conditions. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system.

The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance, a BMP will exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutant.

Inspection Steps

The core to any successful stormwater BMP maintenance program is **routine inspections**. The first year should be regarded as the maintenance interval establishment phase. During the first year, more frequent inspections should occur to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The preferred MTD unit can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access hatch or manhole. Once these access covers have been safely opened, the inspection process can proceed as follows:

- Enter all necessary information including project name, location, date & time, unit number and other info into an inspection form.

- Observe the inside of the system through the access hatches. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the system and all of its chambers.
- Look for any unusual obstructions in the inflow pipe, pre-treatment chamber, filter chambers, discharge chamber or outflow pipe. Enter the observations on the inspection form.
- Through observation and/or digital photographs estimate the number of floatable debris accumulated in the pre-treatment chamber. Through visual observation inspect the condition of the filter cartridges. Watch for excessive build-up of sediments on the surface and any build-up on the top of the cartridges. Record all these observations on the inspection form.
- Based on the outcome of the inspection the maintenance manager must determine if maintenance is required. For the determination, the following Maintenance Indicators should be used.

Maintenance Indicators

Based upon observations made during inspection, a decision on whether maintenance of the system is required could be based on the following indicators:

- Missing or damaged internal components or cartridges.
- Obstructions in the system or its inlet or outlet.
- Excessive accumulation of floatables in the pre-treatment chambers where the length and width of the chamber behind oil/floatables skimmer is fully impacted.
- Excessive accumulation of sediment in the primary and subsequent sedimentation chamber.
- Excessive accumulation of sediment in the filter chambers.
- Substantial build-up of sediments on the filter membrane of the filter cartridges, which will have a very dark appearance, indicating the membrane may be fully saturated with sediment.

Note: For the determination of "excessive accumulation" follow the specific recommendations of the MTD vendor.

Maintenance Equipment

While extraction of accumulated sedimentation could be done by hand, the use of a vacuum truck would be beneficial, minimize time requirements, and increase workers safety. The following typical maintenance equipment would be advisable:

- Flashlight.
- Manhole hook or appropriate tools to access hatches and covers.
- Appropriate traffic control signage and procedures.

- Measuring pole and/or tape measure.
- Protective clothing and eye protection.
- Vacuum truck.
- Trash can.
- Pressure washer.

Note: Entering a confined space requires appropriate safety and equipment, such as forced ventilation. It is generally not required for routine inspections of the system. Entry into the system will be required if it is determined the cartridge filters need washing/cleaning.

Maintenance Procedures

It is recommended that maintenance occurs at **least three days after the most recent rain even** to allow for drain down of the system and any upstream detention systems designed to drain down over an extended period.

It is not recommended to maintain the system while flows are still entering it. That practice would increase the time and complexity required for maintenance. Cleaning of the pre-treatment chamber can be performed from finish surface without entry into the vault utilizing a vacuum truck. Once all safety measures have been set up cleaning of the pre-treatment chamber can proceed as follows:

- Using an extension on a boom on the vacuum truck, position the hose over the opened access hatch and lower into the center of the primary sedimentation chamber. Remove all floating debris, standing water and sediment from the chamber. A power washer can be used to assist if sediments have become hardened and stuck to the walls or the flow of the chamber. Repeat the same procedure for the secondary sedimentation chamber. This completes the maintenance procedure required on the pre-treatment chamber.

If maintenance is required on the filter cartridges, the following procedure can be followed after maintenance on the pre-treatment chamber is performed:

- Following rules for confined space entry use a gas meter to detect the presence of any hazardous gases. If hazardous gases are present, do not enter the vault. Following appropriate confined space procedures, take steps, such as utilizing venting system, to address the hazard. Once it is determined to be safe, enter utilizing appropriate entry equipment such as a ladder and tripod with harness.
- Once entry into the system has been established, the maintenance technician should position themselves in an appropriate manner to remove the cartridges.
- Typically, filter cartridges are fitted in place for easy removal. Follow the specific instruction of the vendor to remove a cartridge. Typically, removal of the cartridge should be done by hand with minimal effort and requires no tools.

- Once the cartridges are removed, they should be lifted out from the vault and brought up to finish surface for cleaning. It is best to use a large garbage can and a standard garden hose (low pressure nozzle) to rinse off each cartridge from the outside to remove accumulated sediments and debris. Once each cartridge is rinsed, it should be prepared for re-installation.
- Each filter chamber should be power washed and vacuumed clean before re-inserting the cleaned cartridges.
- After all cartridges have been cleaned, they can be replaced back into the vault. Follow the specific instruction of the vendor to reinstall the cartridge. The last step is to close up and replace all access hatch lids and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.

Manufactured Treatment Device

Devices Approved by TAP or NJCAT with a TSS Removal Rate of 80 or more

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

Follow manufacturers' requirement. Typical maintenance requirements may include:

- Inspect for clogging and standing water.
- Remove accumulated sediment, trash, and debris.
- Replace media material, if applicable.

Conditions When Maintenance is Needed	Results When Maintenance is Performed
Standing Water	
When water stands over the manufactured treatment device between storms and does not drain per design specifications.	There should be no areas of standing water after inflow has ceased. Filler drains per design specification. Any of the following could apply sediment or trash blockage removed, mulch media replaced, and/or overflow pipe flushed/repaired in manner that does not cause an illegal discharge.
Sediment, Trash, and Debris Accumulation	
Sediment, trash, and debris accumulated in the media material, vault, or piping.	Sediment, trash, and debris removed and disposed of properly.
Mosquitoes	
Evidence of mosquito larvae in treatment unit	No evidence of mosquito larvae.
Miscellaneous	

Conditions When Maintenance is Needed	Results When Maintenance is Performed
Any condition not covered above that needs attend in order for the manufactured treatment device to function as designed.	The design specifications are met.

SECTION 3: INFILTRATION BASIN

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

This category includes BMPs that are designed to detain storm water by storing it in the void spaces of the aggregate and then infiltrated into the underlying soil. Infiltration trenches/basins are prone to clogging, and maintenance consists primarily of preventing sediment buildup and clogging. General conditions when maintenance is needed, and the associated maintenance action triggered by those conditions are provided below.

Monthly or as Needed After Storm Event:

- Remove obstructions, debris and trash from treatment device and perimeter.
- Check observation well 2 to 3 days after storm to confirm drainage.
- Mow and trim surrounding vegetation.
- Inspect inflow and outflow structures for erosion. Repair as needed.

Annually:

- Monitor observation well to confirm that trench is draining properly.
- Inspect the trench for clogging and restore to design conditions, if needed.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Standing Water	
Water stands in the infiltration trench between storms and does not drain within 24 hrs. after rainfall.	There should be no areas of standing water once inflow has ceased. Any of the following can apply sediment or trash blockages removed, grade improved, or removed clogging at check dams.
Trash and Debris	
Trash and debris accumulated in the infiltration trench and around the inlet and outlet.	Trash and debris removed and disposed of properly.
Sediment	
Evidence of accumulated sediment in the infiltration trench.	Material removed so that there is no clogging or blockage. Material is disposed of properly.
Erosion	
Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion	Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
Inlet/Outlet	
Sediment accumulations.	Inlet/outlet is clear of sediment and debris and allows water to flow freely.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Surface Materials	
Material is missing or patchy; areas of bare earth are exposed.	All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
Miscellaneous	
Any condition not covered above that needs attention for the infiltration trench to function as designed.	The design specifications are met.

SECTION 4: DETENTION BASIN

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

This category includes BMPs that are designed to treat storm water by allows pollutants to settle out and gradually release detained storm water through an orifice. Maintenance primarily consists of vegetation management, sediment removal, and mosquito abatement when there is standing water. General conditions when maintenance is needed, and the associated maintenance action triggered by those conditions are provided below.

Monthly or as Needed After Storm Event

- Inspect for clogging and that it drains between storms per design specifications.
- Trim vegetation and inspect for woody vegetation.
- Inspect the level of sediment in the forebay.

Bi-Annually

- Evaluate the health of vegetation.
- Remove sediment, litter, and debris.
- Inspect the outlet, embankment, dikes, berms, and side slopes for structural integrity and signs of erosion or rodent burrows.
- Inspect outlets and overflow structures for plugging and signs of erosion.
- Check inlets to ensure the piping is intact and not plugged.
- Inspect security measures around the facility.

Annually

- Harvest vegetation during dry periods.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Standing Water	
Water stands in the basin between storms and does not drain per design specifications.	Corrected any circumstances that restrict the flow of water from the system and drainage is restored to design condition.
Tree/Brush Growth, Woody Vegetation	
Growth does not allow maintenance access or interferes with maintenance activity, dead, diseased, or dying trees.	Trees do not hinder maintenance activities. Vegetation harvested annually, during dry periods.
Sediment	
Accumulated sediment >10% of design basin depth.	Sediment cleaned out to design shape and depth. Basin reseeded to control erosion, if needed. Sediment disposed of properly.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Erosion	
Erosion on compacted berm embankment. Rodent burrows on slope.	Cause of erosion is managed appropriately. Side slopes or berm restored to design specifications, as needed. Rodent burrows filled.
Inlet/Outlet	
Piping broken or inlet/outlet blocked.	Piping fixed. Debris/sediment removed and disposed of properly.
Fences/Security Measures	
Fences/security measures broken or missing	Fences/security measures around facility are secure.

SECTION 5: VEGETATED BUFFER STRIP

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

This category includes BMPs that are designed to provide to remove pollutants by physically straining and filtering water through vegetation or cobble within the swale/strip. Maintenance is primarily focused on maintaining healthy vegetation and avoiding clogging. General conditions when maintenance is needed, and the associated maintenance action triggered by those conditions are provided below.

Monthly or as Needed After Storm Event

- Inspect swale/strip for ponding.
- Inspect inlets and sheet flow areas for impediments.
- Remove accumulated sediment, litter, and debris.

Bi-Annually

- Inspect vegetation. Prune, mow, weed and remove/replace any dead plants.
- Replenish mulch.
- Inspection irrigation system.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Standing Water	
Water stands in the vegetated swale/strip between storms and does not drain within 24 hrs. after rainfall.	There should be no areas of standing water once inflow has ceased. Any of the following could apply improved grading or underdrains flushed in manner that does not cause an illegal discharge.
Sediment, Trash, and Debris Accumulation	
Sediment, trash, and debris accumulated in the swale and around the inlet and outlet.	Material removed so that there is no clogging or blockage. Sediment deposits removed without significant disturbance of the vegetation.
Erosion	
Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.	No erosion or scouring evident. Damaged areas repaired with crushed gravel. Over time grass will start to cover over rock.
Vegetation	
Vegetation is dead, diseased, or overgrown.	Vegetation is healthy and attractive. Grass is maintained at least 3 inches in height.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Mulch (if used)	
Mulch is missing or patchy. Areas of bare earth are exposed, or mulch layer is less than 3 inches deep	All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
Inlet/Outlet	
Sediment or debris accumulations.	Inlet/outlet is clear of sediment and debris and allows water to flow freely.
Flow Spreader (if applicable)	
Flow spreader uneven or clogged so that flows are not uniformly distributed through entire swale width.	Spreader leveled and cleaned such that flows are distributed evenly over the entire swale width.
Visual Contaminants and Pollution	
Visual evidence of oil, gasoline, contaminants, or other pollutants.	No visual evidence of contaminants or pollutants present.

SECTION 6: RAINWATER HARVESTING VAULTS

Non-Potable Water for irrigation and approved uses by the Building Code.

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

This category includes BMPs that are designed to store water a specific volume of water to use later for irrigation, non-potable water plumbing, vehicle washing, or other non-potable water uses. Maintenance is primarily focused on preventing sediment buildup and clogging, which reduces the capacity of the system. General conditions when maintenance is needed, and the associated maintenance action triggered by those conditions are provided below.

Quarterly or as Needed After Storm Event

- Inspect, clean, and replace filters and screens, as needed.
- Inspect and clean debris from roof, gutters, downspouts, first flush devices, roof washers, or other collection surfaces.
- Inspect for and repair leaks.
- If rainwater is used for indoor use, inspect, and verify that treatment systems are operational and maintaining minimum water quality requirements as determined by DPP or DOH.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Sediment and Debris Accumulation	
Sediment or debris accumulated in filter, screens, gutters, downspouts, first flush device, or roof washers or on roof or other collection surfaces. Sediment accumulated in cisterns(s).	Sediment removed. Collection surfaces do not contribute sediment and debris.
Leaks	
Water leaking from system.	No leakage.
Water Quality	
Treatment system is not working properly.	Treatment system is operational and maintaining minimum water quality requirements.
First Flush Diverter	
First flush filter is full or clogged causing permanent flow to the cistern.	First flush is diverted away from the cistern when the first flush diverter valve is removed and cleaned.
Cistern does not Drain within 48 hours	
Outlet is clogged.	Cistern completely drains in less than 48 hrs.
Cistern Drain under 24 hours	
Cistern leaks or outlet allows excessive flows.	Cistern drains in 24 to 48 hrs.

Vegetated Biofilter - Tree Box Filter Planter Box

Source: STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT for the City and County of Honolulu Operations and Maintenance Fact Sheets

This category includes BMPs that are designed to detain and treat runoff without draining into the underlying soil. Maintenance is primarily focused on maintaining healthy vegetation, avoiding clogging and proper functioning of inlets, outlet, and high-low bypass. General conditions when maintenance is needed, and the associated maintenance action triggered by those conditions are provided below.

Monthly or as Needed After Storm Event

• Inspect bio-filter system, overflow pipe, inlets, and sheet flow areas for clogging and impediments to flow. Repair damaged pipes.

• Remove accumulated sediment, debris, sediment, and repair damaged pipes.

• Inspect and repair/replace or replenish splash blocks or rocks, as needed.

Bi-Annually

• Inspect vegetation. Prune, weed and remove/replace any dead plants. Replenish mulch.

• Inspection irrigation system.

Condition When Maintenance is Needed	Results When Maintenance is Performed
Standing Water	
Water stands in the planter box between storms and does not drain within 24 hrs. after rainfall. Avoid overwatering.	There should be no areas of standing water after inflow has ceased. Any of the following could apply sediment or trash blockages removed, mulch replaced, underdrains flushed in manner that does not cause an illegal discharge.
Vegetation	
Vegetation is dead, diseased, or overgrown.	Vegetation is healthy and attractive. Grass is maintained at least 3 inches in height.
Mulch	
Mulch is missing or patchy. Areas of bare earth are exposed, or mulch layer is less than 3 inches deep.	All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.

SECTION 7: BELOW GROUND DETENTION MODULAR TANKS

Source: Eco Tank, RainSmart, and other vendors of modular storm water tank systems

<<< Depiction of a generic storm water detention tank constructed with modular tank elements.

General considerations - Need to inspect and maintain.

All BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site-specific loading conditions. This is recommended because pollutant loading, and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system.

The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance a BMP will exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutant.

Design with future maintenance in mind

Designing an underground stormwater detention system with future maintenance in mind is a simple process that includes three primary objectives: PREVENT debris from entering the system by using good pre-treatment systems, ISOLATE debris and sediments that manage to enter the system and PROTECT the body of the system by providing backflush mechanisms to ensure longevity.

1. PREVENT: Keeping debris and sediment out of the system by pre-treating runoff is a significant design goal of underground detention systems. Trash and sediments must be avoided to flow unrestricted into an underground system where removal will be expensive. Instead, capture pollutants simply and inexpensively in the inlets, where removal is easy.

A stormwater pretreatment device needs to be installed and maintained to trap debris, sediment and floatables upstream of the inlet. Such pre-treatment devices can be installed in the inlet structure, where it is easy to maintain the device by accessing through a manhole.

2. ISOLATE: Some pollutants may elude the pre-treatment systems and enter the underground tank. It is a good design and maintenance practice to install a so-called maintenance row where pollutants can be trapped. Consolidating sediments in a single location makes them easy to remove.

Maintenance rows are formed by using maintenance modules, which have open internal components that are fully accessible by conventional jet-vac systems. These modules are set in a row (or multiple rows) to your desired length. Longer maintenance rows should include an access structure on both ends. Extremely long rows may require access from the middle of the row, as well. The maintenance row should be wrapped in geotextile independently from the rest of the system. The geotextile retains trash, sediments, and other solids, preventing contamination of the rest of the system. Typically, maintenance rows are sized to treat the first flush (usually 1") of runoff.

3. PROTECT: Maintenance ports are used throughout the system to remove pollutants that bypass the pretreatment system and maintenance row. Maintenance ports should be located close to the inlet and outlet connections.

Inspection and Maintenance

Inspection

Inspection frequency for the tank system must be determined based on the contributing drainage area. Inspections intervals should never exceed one year between inspections; six months should be used during the first year of operation.

Inspections may be required more frequently for pre-treatment systems. Manufacturer requirements should be followed for the proper inspection schedule.

Typically, with the right equipment inspection can be accomplished from the surface without physically entering any confined spaces. If the inspection does require entry into a confined space, safety requirements such as local/regional requirements as well as OSHA standards need to be followed.

Inspection Ports: Usually located centrally in the tank system provide the user with a base-line sediment depth across the system floor.

Maintenance Ports: Usually deeper deposits of heavier sediments are located near the inlet and outlet connections.

Manholes: Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Entire system: If sediment or debris is observed in manholes any of these structures, the inspector should determine the depth of the material deposits. This is typically accomplished with a rod. All observations and measurements should be recorded on an Inspection Log kept on file.

Maintenance

The tank system should be back-flushed once a sizable sediment accumulation has been reached. The manufacturer's recommendation should be followed when to sediment accumulation has reached a critical point that needs intervention.

Before maintenance is performed on the system, the outlet pipe should be closed to prevent contamination of the downstream systems. For back-flushing, water is pumped into the system through all maintenance ports as rapidly as possible. The turbulent action of the water moving through the tank should entrain sediments which can then be pumped out. Removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, perform the back-flush within 24 hours of a rain event. Stormwater entering the system aids in the suspension of sediments and reduce the volume of water required to properly flush the system. The removed, sediment-laden water from the back-flush needs to be filtered before it can be safely discharged.

SECTION 8: SOURCE CONTROL MEASURES USED TO MAINTAIN THE NPDES NO-EXPOSURE CERTIFICATION

The source control measures presented in this Section 8 have been developed for the existing Kapa'a Light Industrial Park (KLIP) and have been implemented in the Upper site. The same source control measures will be implemented in the Lower site.

The source control measures described hereafter are configured to satisfy the requirements of the NPDES No-exposure Exemption program.

Three NPDES No Exposure Certifications have been obtained for three clusters of existing buildings in the Upper site. More NPDES No-Exposure Certifications will be applied for with the new buildings as they are being occupied, both in the Upper and Lower sites.

The source control measures presented in the section are maintained at the KLIP by periodic internal audits. The outcome of the audit has three levels:

- Green: This outcome of the audit suggests that the tenants are in general compliance with the KLIP tenant storm water pollution measures.
- Yellow: This outcome of the audit suggests that the tenants have certain non-compliance issues which are described and which the tenants are obligated to rectify within a given time frame.
- Red: This outcome of the audit suggests that some tenants are having issues which significantly deviate from the requirements. Typically, a Red notice is given if the tenants are not following previous notices to stop the polluting practices. A Red notice typically comes with a notice that if the polluting practice is not stopped immediately, the lease agreement will be affected, or fines will be imposed.
- Red notices have been rare, and tenants have been instructed on the importance of contributing to reducing storm water runoff pollution at the source.

The following are fact sheets that describe the storm water source control measures for pollution control which are distributed to tenants.

Kapa'a Light Industrial Park

Kapa'a Green INITIATIVE: Greening of our Light Industrial Park by Reducing Environmental Impact

What is the Kapa'a Green INITIATIVE:

The **Kapa'a Green Initiative** is an effort spearheaded by the Kapa'a Management Team to reduce the environmental impact, especially impact on the water quality, from light industrial activities in our warehouse and baseyard development in Kapa'a Valley.

We care about the environment and the community and take active steps to protect natural resources and conduct our business with respect to the windward community.

Storm Water Guidebook for Kapa'a Tenants

Avoidance of polluted stormwater discharges in accordance with NPDES requirements of "No Exposure"

First Edition: November 25, 2016; Last Revision Nov 2020)

Avoidance of polluted storm water runoff from our facility:

The avoidance of stormwater related pollution is one of our main goals since our light industrial are located next to the Kapa'a Stream and the Kawainui Marsh.

Companies which meet the requirements of the law (NPDES) have to obtain a permit to discharge stormwater that is associated with industrial activities. The responsibility to obtain permits lies with the company from whose facility stormwater is discharged. This responsibility can be averted by obtaining an umbreallt permit coverage.

NPDES = National Pollution Discharge Elimination System

Benefit for Kapa'a Tenants to be Covered under the Umbrella stormwater permit coverage:

The Kapa'a Management has obtained an umbrella stormwater permit coverage, which allows tenants to conduct their industrial activities without the need obtaining individual permit coverage. This will save tenants significant costs and efforts since they have stormwater permit coverage while they lease space in the Kapa'a Light Industrial Park.

We need the cooperation of every Kapa'a Tenant and their Employees to meet the strict requirements of the Umbrella storm water "No Exposure" permit coverage

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Guidebook for Kapa'a III Tenants: Avoidance of polluted stormwater discharges and complying with No-Exposure Conditions of Kapa'a Umbrella Permit coverage -

Important information for current or prospective tenants – Please Keep for Future Reference

The Importance of Responsible Stormwater discharge and abiding by the State and County Regulations (Page 1 of 2)

Regulations for storm water discharge from industrial facilities

Rain which falls in any parts of industrial facilities runs off as storm water is called "storm water associated with industrial activities". This stormwater needs to be discharged in an environmental friendly way to avoid impacts to the environment. There are increasingly strict regulations in place which, if not followed, can result in significant penalties.
Kapa'a Management has obtained a so-called "Non-exposure permit coverage" (No Exposure) for the entire light industrial facility, which covers all tenants. The coverage also implies that all tenants are obliged to abide by the No-Exposure regulations.

What is "No Exposure": In a nutshell, No Exposure means **that all industrial materials and activities** are protected by storm resistant shelter to prevent exposure to rain, and/or runoff.

What are Storm-Resistant Shelters?

Storm-resistant shelters are completely roofed and walled buildings or structures as well as structures with only a top cover, but no side coverings, provided materials and activities underneath are not in contact with storm water. Materials and activities may be sheltered by temporary covers until permanent enclosure can be achieved or if the material that is under the temporary cover is only there for a short period of time.

Temporary shelters are NOT permanent, which mean long-term No Exposure solutions.

The Kapa'a Management has obtained **No-Exposure permit coverage** under which all tenants are operating

What are Industrial Materials and Activities: Industrial materials and activities include, but are not limited to, material handling equipment or activities; industrial machinery; raw materials, intermediate products, by-products, and final products; and waste products.

What are Material Handling Activities: Material handling activities include storage, loading, unloading, transportation or conveyance of any raw material, intermediate product, by-product, final product or waste product.

What are Industrial Materials:

Examples of Industrial materials include:

- Raw materials
- Fuels
- Materials such as solvents, detergents, and plastic pellets
- Finished materials such as metallic products. Intermediate materials which are part of the material handling
- Raw materials used in food processing or production
- Hazardous substances
- Any chemical the facility is required to report pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act(EPCRA)
- Fertilizers
- Pesticides
- Waste products such as ashes, slag, and sludge

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The Importance of Responsible Stormwater discharge and abiding by the State and County Regulations (Page 2 of 2)

Practices which are considered "No Exposure" of Industrial Material

The intent of the "No Exposure" permit coverage is to promote conditions of permanent and not only temporary "No Exposure". The following are examples of practices that provide "No Exposure" of industrial material.

- Above ground storage tanks with no piping, pumps or other equipment leaking contaminants that could contact storm water and a double walled tank or a tank with secondary containment. A spill containment and clean-up kit must be available for personnel dispensing product.
- Lidded dumpsters provided the containers are completely covered and there are no holes in the bottom of the container to allow leakage.
- Adequately maintained vehicles that are used outdoors (cars, trucks, forklifts, trailers, etc. but no industrial machinery), which are not leaking or are otherwise a potential source of contaminants.
- Vehicle and vessel maintenance facilities in which the only maintenance activity conducted outdoors is vehicle fueling. (special requirements apply)
- Products and materials that are transported between buildings that would otherwise be required to be stored indoors because they are industrial materials provided the material is adequately protected from precipitation and could not be released as a result of a leak or spill.

The Kapa'a Management has obtained **No-Exposure permit coverage** under which all tenants are operating.

What are Materials are not considered Industrial: and therefore qualify for No Exposure

- Final Products: Many final products which are meant to be used outdoors (i.e. cars, garden chairs) pose little risk of storm water contamination, meaning the products cannot be mobilized by precipitation or runoff.
- Containers, racks and other transport platforms (pallets) used for the storage or conveyance of these final products would also not be considered industrial materials, providing the containers, racks, and platforms are pollutant-free. Containers which store industrial material must be close and should not be used for active loading, unless they can be regarded as shelters.
- Finished or Intermediate Products that are stored outdoors and are exposed to storm water but do not have solubility potential, e.g. painted metal parts or unfinished metals that do not have oil or other contaminants on their surfaces, washed rock.

This page describes under which conditions No Exposure can be considered for industrial practices and materials.

The following pages show illustrative examples on acceptable and unacceptable No Exposure practices and material handling

Guidebook for Kapa'a III Tenants: Avoidance of polluted stormwater discharges and complying with No-Exposure Conditions of Kapa'a Umbrella Permit coverage -
Important information for current or prospective tenants – Please Keep for Future Reference

Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Dust Control at Manufacturing Areas

Description of Pollutant Sources:
Industrial material handling activities can generate considerable amounts of dust that is typically removed using exhaust systems. This can generate air emissions that can contaminate stormwater.

Uncontrolled dust can be entrained into the stormwater and create significant storm water pollution

Dust should always be controlled and no entrainment of dust into stormwater must be allowed

What to do to avoid stormwater pollution and establish No Exposure conditions:

Any dust or powdery substance that is a product of the industrial activity must be contained and not allow to be entrained and transported by stormwater

How to achieve No Exposure:

Preferred procedure: Conduct all industrial material handling that generates dust inside a permanent storm resistant shelter and perform dust control

Additional procedure:

- Regularly sweep dust accumulation areas that can contaminate stormwater. Sweeping should be conducted using vacuum filter equipment to minimize dust generation and to ensure optimal dust removal.
- In manufacturing operations, train employees to carefully handle powders to prevent generation of dust.
- Clean, as needed, powder material handling equipment and vehicles that can be sources of
- stormwater pollutants, to remove accumulated dust and residue.
- Use dust filtration/collection systems such as bag house filters, cyclone separators, etc. to control vented dust emissions that could contaminate stormwater.

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Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Source Control BMPs for Loading Areas for Liquid or Solid Material

Description of Pollutant Sources:
Loading of liquid and solid industrial materials, including raw materials, intermediate products, waste materials, fuels, scrap metals, etc. are potential causes of stormwater contamination through washing off of solids and spilled liquids.

The preferred procedure of loading and unloading liquid or solid material is in a building, under a roof or under other appropriate cover. If outdoor loading or unloading operations cannot be avoided, measures have to be taken to avoid exposure, such as no loading of unloading during rain events.

During loading industrial material should not be exposed to stormwater

Preferred loading procedure: Loading should occur inside a storm resistant shelter.

Additional procedure that LOWER exposure during loading

- Solid material debris can accumulate at outside, uncovered loading/unloading areas, these surfaces should be swept frequently to remove loose material that could otherwise contaminate stormwater. Sweep areas temporarily covered after removal of the stored materials. For liquid material place drip pans or other appropriate temporary containment device at locations where leaks or spills may occur, such as hose connections and filler nozzles. Drip pans shall always be used when making and breaking connections.
- Place curbs along the edge of loading/ unloading areas adjacent to surface water bodies, or slope the edge of the loading area such that the stormwater can flow to an internal storm drain system that leads to an approved treatment BMP.
- Pave and slope loading/unloading areas to prevent pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they should be placed in designated "alleyways" that are not covered by material, containers or equipment.

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Source Control BMPs for Maintenance and Repair of Vehicles and Equipment

Description of Pollutant Sources:
Pollutant sources include parts/vehicle cleaning, spills/leaks of fuel and other liquids, replacement of liquids, outdoor storage of batteries/liquids/parts, and vehicle parking.

Work and material storage associated with maintenance and repair of vehicle and equipment must be carried out inside a building or under a storm-resistant shelter.

If unfinished vehicles are temporarily (*) left outside any exposed part that can cause leaks or contamination and therefore needs to be covered with tarp.

Additional procedure that LOWER exposure during maintenance and repair of vehicles and equipment:

- Inspect for leaks all incoming vehicles, parts, and equipment stored temporarily outside.
- Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination.
- Store used or damaged batteries in a designated are, is inside a building or under a storm-resistant shelter.

Work and material storage associated with maintenance and repair of vehicle and equipment is inside a building or under a storm-resistant shelter. If unfinished vehicles are temporarily (*) left outside any exposed part that can cause leaks or contamination needs to be covered with tarp. *(*) temporarily infers to "short-term such as overnight" and not several days and weeks*

Additional procedure that LOWER exposure during loading (continue):

- Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel. Do not pour/convey wash water, liquid waste, or other pollutant into the stormwater drainage.
- Cover exposed vehicle parts with a temporary cover, such as a tarp.
- Clean parts with aqueous detergent based solutions or non-chlorinated solvents such as kerosene or high flash mineral spirits, and/or use wire brushing or sand blasting whenever practicable. Avoid using toxic liquid cleaners. Choose cleaning agents that can be recycled.
- Do not hose down work areas. Use dry methods for cleaning leaked fluids.
- Recycle greases, used oil, oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic fluids, transmission fluids, and engine oils. Do not mix dissimilar or incompatible waste liquids stored for recycling.
- Inspect all BMPs regularly, particularly after a significant storm.

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Source Control BMPs for Manufacturing Activities Conducted Outside

Description of Pollutant Sources:
Manufacturing pollutant sources include outside process areas, stack emissions, and areas where manufacturing activity has taken place in the past and significant pollutant materials remain and are exposed to stormwater.

All manufacturing activities should be conducted inside a building or under a storm-resistant shelter ; connect floor drain to an approved treatment system.
Manufacturing activities conducted outside must follow essential source control measures, such as described below, and should always be considered the exception.

Example of spill containment berms to contain storm water from outdoor work areas and allow collection and proper treatment

Products shown only as an illustration

Essential source control measures
- Sweep paved areas regularly, as needed, to prevent contamination of stormwater.
- Berm the floor as needed to prevent drainage of pollutants to outside areas.
- Storm water that accumulates inside the bermed area has to be collected and stored in holding tanks, before the stormwater is appropriately treated.
- Change the type of manufacturing activity by eliminating the contamination of stormwater.
- Convey the segregated pollutants to an approved treatment process or a dead-end sump.

Storm water collected inside the containment has to be stored in holding tanks and subsequently appropriately treated

!! **Note:** ***Manufacturing activities outside the leased spaces are additionally regulated by the Kapa'a Management.***

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Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Source Control BMPs for Parking and Storage of Vehicles and Equipment

Description of Pollutant Sources:
Parking lots and driveways can be sources of toxic hydrocarbons and other organic compounds, oils and greases, metals, and suspended solids caused by the parked vehicles.

Vehicles operating and parked at the facility have to be in good working order and must not leak.

No vehicles with leaks are allowed to be operated within the Kapa'a Light Industrial park.

Owners of vehicles which cause fuel and oil spills are responsible for the spill containment and removal of spilled fluids

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Source Control BMPs for Storing Containers of Liquids

Description of Pollutant Sources:
Steel and plastic drums with volumetric capacities of 55 gallons or less are typically used at industrial facilities for container storage of liquids and powders. Leaks and spills of pollutant materials during handling and storage are the primary sources of pollutants.

Recommended storage inside building or storm resistant shelter

Only clean barrels in good conditions without operating valves and drains can be stored outside.

No barrels with operating valves are allowed outside with adequate storm-resistant shelter

Containers and drums with liquid material should be stored inside buildings or under storm-resistant shelters. If stored outside the following pollution prevention measures have to be taken.

Essential source control measures

- Inspect the tank containment areas regularly for leaks, spills, cracks, corrosion, etc. to identify problem components such as fittings, pipe connections, and valves, for leaks/spills, cracks, corrosion, etc.
- Only clean and non-leaking barrels without operating valves and drains can be stored outside.
- Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
- If using containment install drain with a sump pump. The containment volume must be equal to 0.1 times the enclosed total tank volume inside the containment or 1.1 times the volume of the largest container stored within the diked area, whichever is greater
- Stormwater collected in the containment area will need to be discharged by appropriate treatment procedure.
- Add safeguards against accidental releases including protective guards around tanks to protect against vehicle or forklift damage, and tagging valves to reduce human error.

No leaking or corroded barrels are allowed to be stored outside.

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Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Source Control BMPs for Washing and Steam Cleaning Vehicles and Equipment

Description of Pollutant Sources:
Vehicles, and industrial equipment may be commercially cleaned with low or high pressure water or steam. The cleaning can include hand washing, scrubbing, sanding, etc. Wash water from cleaning activities can contain oil and grease, suspended solids, heavy metals, soluble organics, soaps, and detergents that can contaminate stormwater.

All cars, trucks and equipment should be washed off site, at a commercial washing facility in which the washing occurs in an enclosure and drains to the sanitary sewer, or, If this not feasible, effective pollution prevention measures must be implemented.

Recommended wash pads for truck, wash water treatment indicated (Hydroengineering)

Steam cleaning only on wash pads

Preferred – roofed wash pad provides increased protection against uncontrolled wash water runoff

Essential source control measures

- Conduct outside washing operation in a designated wash area at the facility, which is a paved area, constructed as a spill containment pad to prevent the run-on of stormwater from adjacent areas.
- The wash water must be conveyed to a sump or other appropriate wastewater treatment or recycle system.
- Clean the concrete pad of the wash area thoroughly until there is no foam or visible sheen in the wash water prior to closing the inlet valve and allowing uncontaminated stormwater to overflow and drain off the pad. For uncovered wash areas, the control valve may be manually operated.
- Post signs to inform people on the operation of the wash area.
- Use phosphate-free biodegradable detergents. Because soluble/emulsifiable detergents can be used in the wash medium, the selection of soaps and detergents should be considered carefully. Oil/water separators are ineffective in removing emulsified or water soluble detergents.

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Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Source Control BMPs for Storage of Solid Materials, Byproducts, or Finished Products

Description of Pollutant Sources:
Solid raw materials, by-products, or products such as gravel, lumber and other building materials, concrete, and metal products sometimes are typically stored outside in large piles, stacks, etc. at industrial facilities. Exposure of outside bulk materials with stormwater can cause leachate, and erosion of the stored materials.

Solid Raw Materials, Byproducts, or Finished Products should be stored inside a building or a paved and bermed covered area. In cases when outside storage and transfer is required, especially temporary storage, effective stormwater pollution prevention measures are required.

Essential source control measures

- Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment.
- Slope the paved area in a manner that minimizes the contact between stormwater and leachable materials.
- If temporarily storing raw materials, byproducts, or finished products inside a building, a paved and bermed covered area or under a storm-resistant shelter is impractical, the products must be covered with a tarp to avoid exposure to stormwater.

Clean wooden pallets which are not covered with oil or material that can be washed away can be stored out side

Not allowed are pallets that are dirty and covered with oil or other pollutants which can be entrained by storm water

Recycled auto parts, such as shown in the pictures cannot be stored outside without proper cover and containment .

Finished products that are intended for outside use can be stored outside

Finished products that are intended for outside use, such as the PVC piping, can be stored outside.

Kapa'a Light Industrial Park Page 1 – *Satisfying No Exposure Conditions* **Page 11**

Guidebook for Kapa'a III Tenants: Avoidance of polluted stormwater discharges and complying with No-Exposure Conditions of Kapa'a Umbrella Permit coverage -
Important information for current or prospective tenants – Please Keep for Future Reference

Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Source Control BMPs for Spills of Oil and Hazardous Substances

Description of Pollutant Sources:
Spills of oil and other hazardous substances can cause significant damages to the environment. Any spill has to be taken serious and dealt with in the appropriate manner. In Hawaii spills over 25 gal and those smaller but which are not contained within 72 hours have to be reported.

Have spill kit available at the facility

Familiarize your team at the sue of spill kit components

The preferred storage of oil or hazardous liquids at the facility is in smaller quantities and in buried storage tanks. In case larger than threshold quantities are stored in above round tanks effective pollution control measures have to be implemented.

Good planning for Spill containment and control includes the following:

- A site plan showing the location of storage areas for chemicals, the locations of storm drains, the areas draining to them, and the location and description of any devices to stop spills from leaving the site such as positive control valves;
- Familiarity with the notification requirements for the different sizes of spills (reporting agency is required by law.)
- Train personnel in the implementation of the spill containment and removal procedure
- **Immediately clean up spills**. Do not use emulsifiers for cleanup unless an appropriate disposal method for the resulting oily wastewater is implemented. Absorbent material **shall not be washed down** the stormwater drainage.
- Have emergency spill containment and cleanup kit(s) available in high potential spill areas. The type of spill kit has to be appropriate for the type and quantities of liquids stored at the facility. Spill kits should be deployed in a manner that allows rapid access and use.

In Hawaii, oil spills over 25 gallons have to be reported; also, spills less than 25 gallons but which are not contained and cleaned up within 72 hour have to be reported.

Guidebook for Kapa'a III Tenants: Avoidance of polluted stormwater discharges and complying with No-Exposure Conditions of Kapa'a Umbrella Permit coverage -

Important information for current or prospective tenants – Please Keep for Future Reference

Illustrative examples of acceptable and unacceptable No Exposure practices and material handling in the Kapa'a Light industrial Park

Good housekeeping procedures at the Kapa'a Facility

Good housekeeping practices offer a practical and cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. Good housekeeping practices also help to enhance safety and improve the overall work environment. An effective good housekeeping program not only benefits stormwater quality but makes the facility a clean, safe place for employees and clients.

Good housekeeping practices make a huge difference. To maintain a high value facility

Good housekeeping practices: Use only lidded dumpsters, provided the containers are always completely covered and there are no holes in the bottom of the container that allow leakage.

Correct dumpsters with closed covers;

Even new dumpsters in good conditions do not qualify for No-Exposure if they are left open

Old dumpsters often leak and have no or defective lids. These are not allowed.

In addition to storm water prevention and satisfying no exposure conditions, good house keeping are required as part of the lease agreement

Kapa'a Light Industrial Park Page 1 – *Satisfying No Exposure Conditions* **Page 13**

REFERENCES

DPP (2017) "STORM WATER BMP GUIDE FOR NEW AND REDEVELOPMENT", by City and County of, Department of Planning and Permitting

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Appendix F:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

OFFSTREET PARKING AND TREES ADJACENT TO WAREHOUSES (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix F

Preliminary Off-Street Parking and Trees Concepts

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

DPP	City and County of Honolulu, Department of Planning and Permitting
KLIP	Kapa'a Light Industrial Park
LID	Low Impact Development
MTD	Manufactured Stormwater Treatment Device
ROH	Revised Ordinances of Honolulu
Lower site	Lower portion of the project site in TMK 4-2-15:014
Upper site	Upper portion of the project site in TMKs 4-2-15:013 and 014

SECTION 1: OVERVIEW AND ZONING REQUIREMENTS AT KAPA'A

The Revised Ordinances of Honolulu (ROH) require the planting of trees on parking lots.

The number and spacing of trees are dependent on the size of the trees. ROH 21 Section 6 differentiates between small, 2-inch caliper, and 6-inch caliper and defines how big the planting areas needs to be and how many parking spaces should be served by these trees. ROH indicates that for trees with calipers between 2 and 6 inches, there I,s a fractional allocation of number of parking spaces and planting area needed required.

ROH 21 Article 6. Off-street Parking and Loading has the following conditions that apply to the Kapa'a project site:

ROH Sec. 21-6.20 Off-street parking requirements:

- Minimum Off-Street Parking Ratios: AGRICULTURE, INDUSTRY AND WAREHOUSING 1 per 2,000 square feet

ROH Sec. 21-6.50 Parking space dimensions and access:

- Standard parking spaces must be at least 18 feet in length and eight feet three inches in width, with parallel spaces at least 22 feet in length.
- Compact parking spaces must be at least 16 feet in length and seven feet six inches in width, with parallel spaces at least 19 feet in length.
- Motorcycle and moped parking spaces must be at least eight feet in length and four feet in width and must provide a minimum five-foot wide access way clear of obstructions.

Minimum aisle widths for parking bays must be provided in accordance with Table 21-6.4. (ROH)

Table 21-6.4 Parking Aisle Widths	
Parking Angle	Aisle Width
0º - 44º	12 ft.
45º - 59º	13.5 ft.
60º - 69º	18.5 ft
70º - 79º	19.5 ft.
80º - 89º	21 ft.
90º	22 ft.

Sec. 21-6.80 Surface parking site planning.

(b) Surface parking lot landscaping and screening. Parked vehicles in surface parking lots must be screened from view from all streets and public spaces.

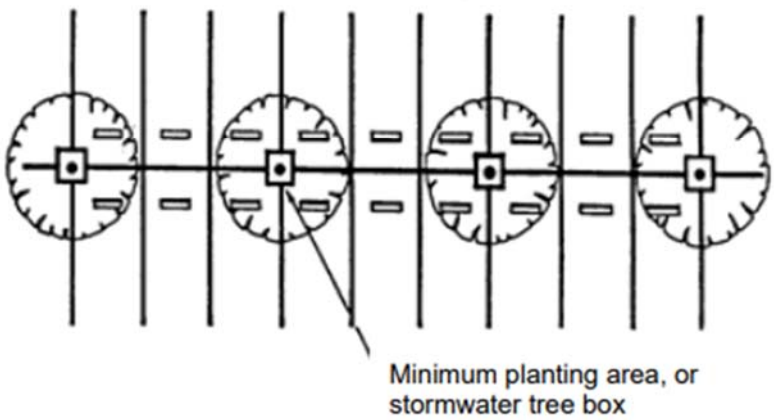
(1) Surface parking lots of five or more parking spaces must provide a minimum five-foot landscape strip adjacent to any adjoining street right-of-way. This five-foot strip must contain a continuous screening hedge a minimum of 42 inches in height with plantings a maximum of 18 inches on center. If the

landscape strip is wider than five feet, the hedge may be placed elsewhere within the strip. A minimum 42-inch-high wall or fence may be placed behind the setback line in lieu of a hedge. If a wall or solid fence is erected, either a vine or shrub must be planted at the base of the wall or solid fence on the side fronting the property line. One canopy form tree, a minimum of two-inch caliper, must be planted in the landscape strip for each 30 feet or major fraction of adjacent lineal street frontage. (See Figure 21-6.2.)

(2) To provide shade in surface parking lots and minimize visibility of paved surfaces, parking lots with more than five parking spaces must provide one canopy form tree, a minimum of two-inch caliper, for every six parking spaces or major fraction thereof, or one canopy form tree of six-inch caliper or more for every 12 parking spaces or major fraction thereof (see Figure 21-6.2). Each tree must be in a planting area or tree well a minimum of 16 square feet in area for 2-inch caliper trees, or a minimum of 25 square feet in area for 6-inch caliper trees. The minimum width of an area for a tree is three feet. Hedges and other landscape elements, including planter boxes over six inches in height, are not permitted within the overhang space of the parking spaces. Trees must be sited to evenly distribute shade throughout the parking lot. As an alternative to the above-described planter areas for trees, a tree box specifically designed to treat stormwater runoff may be used on a one-for one basis in place of the landscaped area. Tree boxes must be approved for compliance with the rules related to stormwater quality.

Figure 21-6.2
Permitted Vehicle Overhangs

Example: One canopy tree for every six parking spaces.



ROH Figure 21-6.2

Note: The configuration of parking spaces at the project site would differ for a portion of all parking lots

For the proposed site development, the trees would not be used for storm water treatment. Strom water runoff would be excluded from entering the tree planted areas. This condition is necessary so that no larger quantifies storm water runoff from adjacent paved areas would enter the pervious planted areas and percolate down to the landfill body.

As a required site development condition, infiltration of sizable quantities of water at the site must be avoided. Infiltration of quantities of storm water into the landfill body must be avoided so that no potentially harmful leachate could be generated.

SECTION 2: CHALLENGES FOR TREES IN PARKING LOTS

Many of the urban challenges that trees face begin with the construction process. At the beginning of parking lot construction, topsoil is generally removed. The subgrade is then compacted, followed by layers of crush, and run stone, and asphalt or concrete that are spread and compacted. If municipal compaction specifications are adhered to, the resulting soil mix under the pavement is generally impenetrable to roots due to mechanical impediment. Tight compaction also limits root growth due to low available oxygen.

Trees planted near pavement often suffer due to root damage and soil volume restriction. The lateral growth of shallow tree roots can cause pavement to crack and heave, creating "lips" or "stub-toe" spots because of uneven displacement of adjoining sections of concrete.

This root vs. pavement conflict is one of the most pervasive problems associated with urban trees.

Selecting appropriate trees for parking lots and other paved areas is challenging. Paved surfaces are engineered to quickly shed water, often in directions that either deprive trees of adequate soil moisture or leave their roots submerged in excess water. Heat from parking lots and other pavement is exacerbated by the solar heat sink of the pavement, with adjacent buildings and cars adding to the stress. Limited soil volumes confine roots, restricting root growth, reducing anchorage, and often supplying inadequate moisture and nutrients. The stress of compaction and low soil fertility, coupled with other physical, environmental, and human forces acting against trees makes parking lots and paved areas unfriendly to trees. These factors combined make 7 - 10 years the average life expectancy of most urban trees.

Figure 2.1 shows a typical arrangement of trees planted at a parking lot.

Figure 2.1: Typical tree planting arrangement at parking lot

SECTION 3: SELECTION AND PLANTING RECOMMENDATIONS

Appropriate tree species must be used since site-specific conditions dictate the type of tree. The final selection of trees for the Kapa'a project site will be made by an arborist during the detail engineering phase.

While the final selection will be done later in the project the following are generic recommendations which have been identified in the literature:

- Trees with large surface roots that may damage pavement should be avoided. Trees with dense canopies that block light penetration to the pavement, preventing rapid evaporation of precipitation should also be avoided.
- Trees that can litter the pavement with fruit, branches, and large leaves may create possible liability and maintenance problems.
- A soil volume of 2 to 3 cubic feet per 1 square foot of crown spread is recommended. Where soil volumes are restrictive, smaller tree species should be selected, or species that are especially heat and drought tolerant.
- Plan for the mature size of the tree above ground. Mature tree heights should not interfere with overhead utility lines or building overhangs.
- Tree spreads should not interfere with pedestrians or vehicles that must pass beneath the trees. In narrow areas, upright or columnar cultivars of trees may be needed.
- Maintain 2 - 3 inches of mulch around the tree trunk, replenishing the mulch as needed. The mulch should not contact tree trunk.
- Minimize the number of competing plants within this mulched area.
- Whenever possible, design permanent drip or pop-up irrigation systems. Restricted root systems, reflected heat, and dry summers create extreme drought stress for trees in parking lots and other paved areas.
- Avoid cutting tree roots when irrigation is installed after trees are established. Be sure the amount of irrigation is appropriate for the tree species because irrigation quantities needed for turf maintenance are generally excessive for trees.
- Fertilize if tree growth (pale and small leaves or stunted twigs) and/or soil or plant tissue analyses indicate nutrient deficiencies. Application of a controlled release nitrogen fertilizer may be needed every year or two if no turf fertilizer is applied and if soil volumes for root growth are restrictive.

Figure 3.1 shows an autograph tree (Clusia rosea) as an example of a tree species that has been successfully used for parking lots in Hawaii. It should be noted that this tree species is regarded to have a vigorous growth habit that might negatively impact native tree species.

Figure 3.1: Autograph tree (Clusia rosea) used for parking lot in Hawaii

Note: The autograph tree is considered an invasive species in Hawaii. This tree species is regarded to have a vigorous growth habit that might exert negatively impact on native species.

SECTION 4: NEW STRATEGIES FOR TREES INSIDE PAVED AREAS

Research on tree planting practices has yielded new information on reducing stress to urban trees. Some of these practices include the use of root barriers, engineered soils, updated pavement repair methods or replacements, and different methods of tree pit construction. Root barriers can be used to divert tree roots from sidewalks and other paved areas. Barriers are made of either rigid plastic or herbicide-treated polypropylene fabric. The barriers can be placed in vertical soil trenches between the tree and the pavement to divert lateral roots downward. If soil conditions are favorable, most roots will continue growing laterally at a lower depth along the barrier, although some may resurface after they grow under the barrier.

Pavements need a firm foundation (compact soil) to ensure structural integrity. Conversely, compacted soil is a major problem of surface tree root development. To satisfy the needs of both trees and pavement, engineered soils are used in tree pits. Engineered soil can have a mixture of gravel and soil so that weight-bearing loads are transferred from stone to stone in the gravel while leaving the soil between the stones essentially unaffected by compaction. The overall effect of this engineered soil is to create a larger rooting volume with increased porosity, nutrient holding capacity and drainage. All of which enable a healthier environment for tree root growth.

Conventionally designed tree wells are nothing more than containers set into the ground. Tree roots are restricted to this confined area surrounded by densely compacted soils. With little oxygen, moisture, and nutrients available, the roots often grow into the weakest available fissures and seams, which is usually the interface area between the compacted base and sub-soil or paving surface. It is this process that causes the heaving and fractures we see in sidewalks, roadways, and parking lots every day.

An example of structural soil is Cornell University's CU-Structural Soil®. The structural soil creates a porous, oxygen-filled root zone, while still maintaining the structural durability to support concrete, asphalt, or other hard surfaces for roadways, parking lots, sidewalks and more.

The developer of the structured soil describes that cracks, lips, and undulations can become a huge liability for cities as they are responsible for a large volume of trip and fall injuries every year. Besides the safety issue, the conventional tree pit and its confined growing environment are responsible for the premature death of many of our street trees. Cities incur the additional costs of removal and replacement in one half or even one third of the tree's normal life span.

Figure 4.1 shows an installation example of structured soil underneath a paved area. The structured soil provides trees with an oxygen-filled root zone beneath pavement, allowing tree roots to grow freely underneath pavement.

Figure 4.1: Application example of a structured soil underneath paved areas.

CU-Structural Soil ® (U.S. Patent #5,849,069) is a soil designed by Cornell University to improve the growth and development of urban trees.

Figure 4.2 shows an application schematics for a tree planting using structured soil. Figure 4.2 shows a cross-section of typical tree installation into structural soil. Where the tree pit is open, topsoil should be placed around the tree ball, but CU-Structural Soil™ should be placed under the ball to prevent tree ball subsidence.

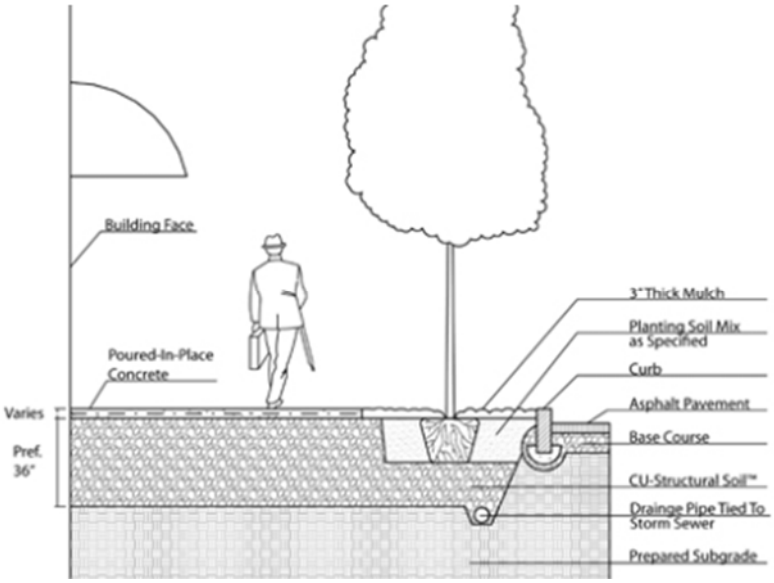


Figure 4.2: Application example of a structured soil underneath paved areas.

SECTION 5: TREE PLANTING APPROACH FOR KAPA'A PARKING

Figure 5.1 shows an initial design concept of tree planted at the Kapa'a project site. The final design will be developed during the detail engineering phase.

The depicted installation configuration in Figure 5.1 uses an equivalent of a structured soil that will surround planting soil containing the tree roots. The tree will be irrigated so that no storm water runoff is allowed to the tree pit, which is surrounded by a 3-inch (preliminary) curb. Excess irrigation water that is not used by the tree will be drained to the storm water drainage system.

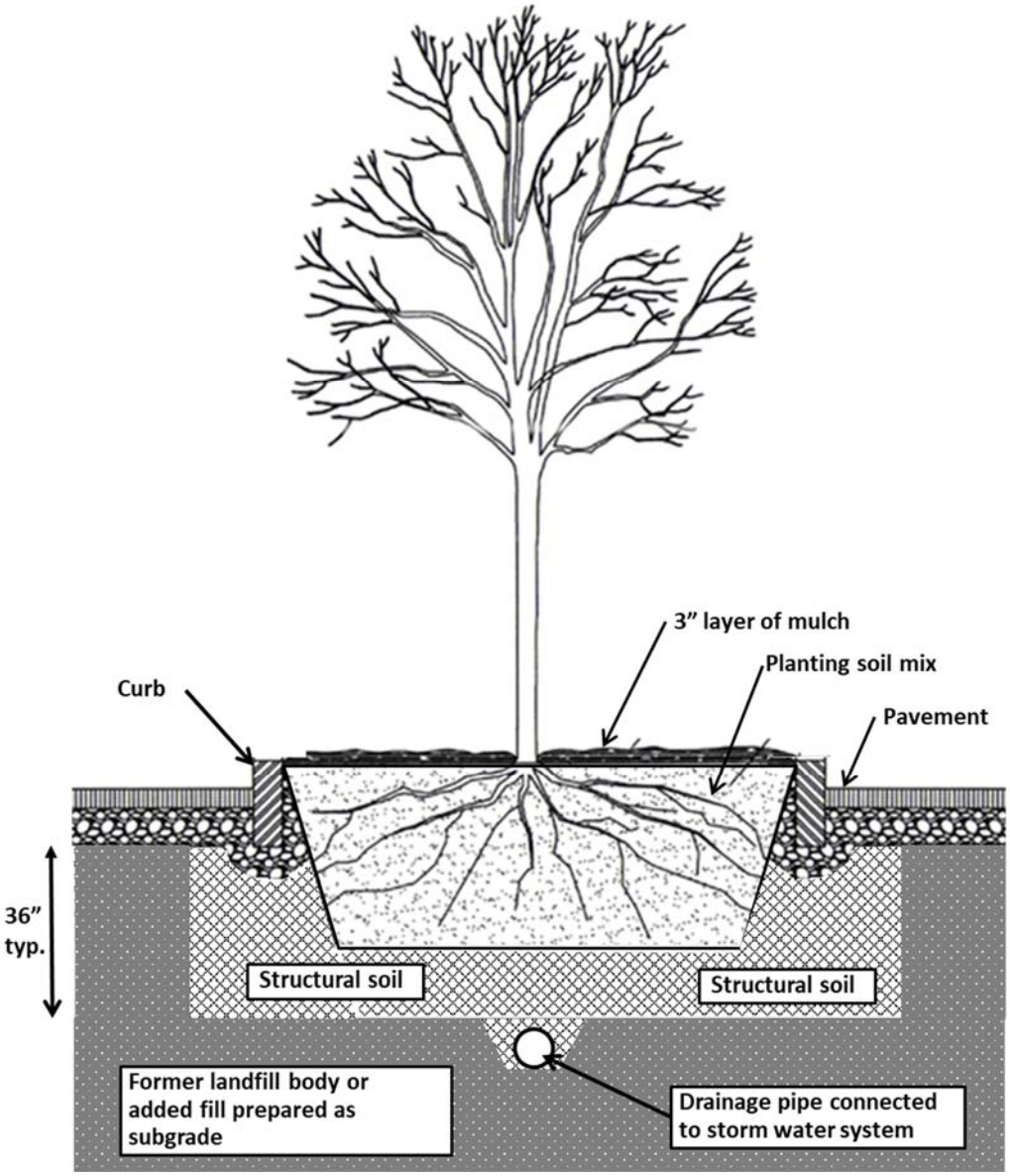


Figure 5.1: Design approach for trees planted at the Kapa'a project site

SECTION 6: PRELIMINARY ARRANGEMENT FOR TREE PLANTING AT KAPA'A PARKING

Figure 6.1 shows the preliminary concept for a generic parking arrangement along a planned warehouse at the Kapa'a project site.

Most of the parking arrangements at the warehouses will have cars and trucks parking perpendicular to the warehouse front. Where access is required to the warehouse doors and gates, parking spaces will be marked "space reserved" or "no parking here". Handicap parking space will be arranged as appropriate with an access aisle between 2 adjoining handicap parking spaces.

Figure 6.1 indicates that the number of parking spaces between trees will be a function of the size of the tree at a mature stage.

The type of parking spaces used at the project site will be mostly "standard sizes" of 8.5 to 18 feet. There will also be "compact" spaces offered. Loading spaces will be sized differently and on a case-by-case basis. Parking and loading spaces for larger trucks will be detached from the warehouse and made available to multiple warehouses.

The distance between the warehouses is typically maintained at 60 feet. This allows the installation of two opposing 18-foot parking spaces separated by the required 22-foot aisle widths.

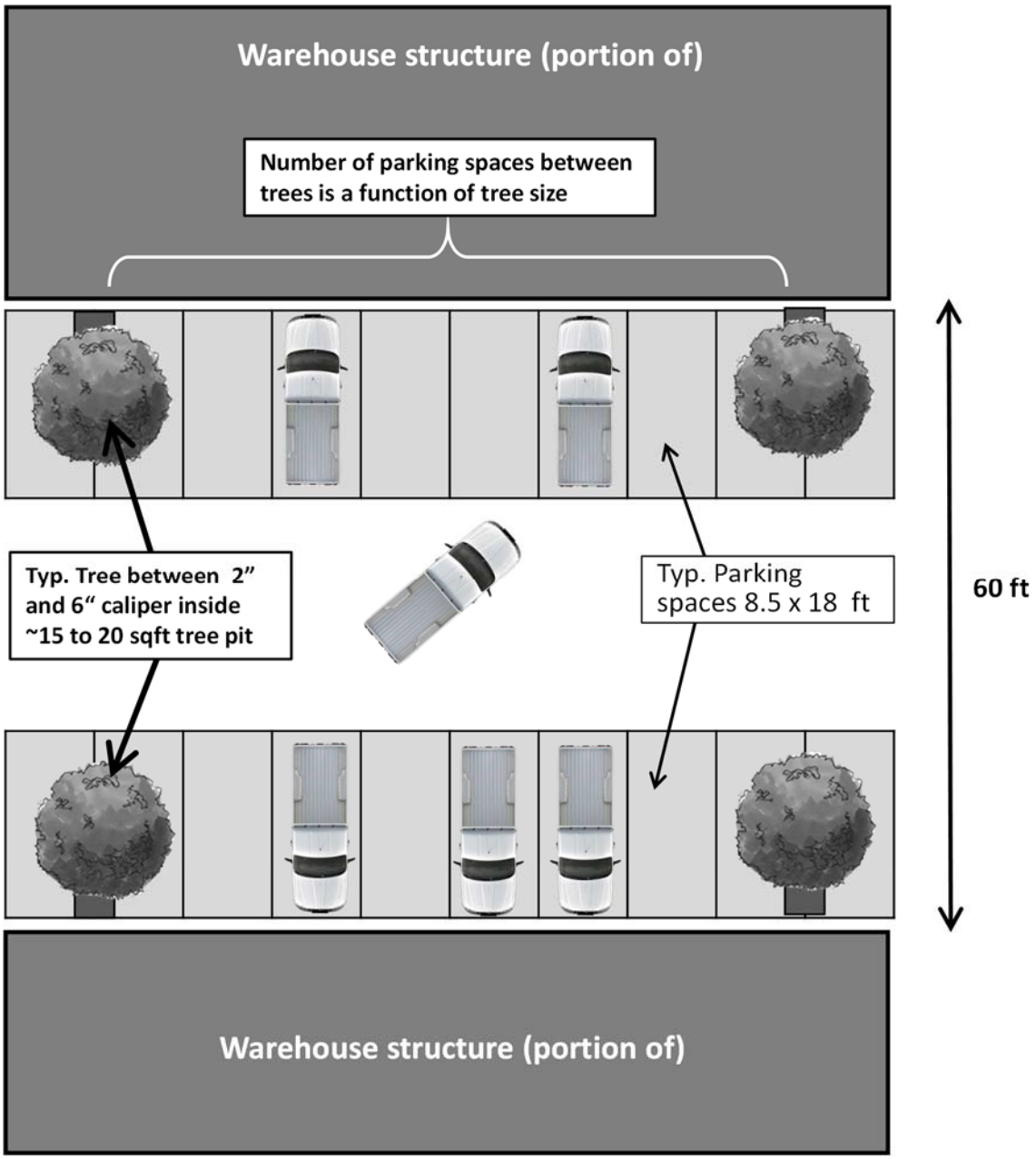


Figure 6.1: Preliminary arrangement of trees at parking lots at project site

REFERENCES

Revised Ordinances of Honolulu (ROH) 21 Articles 6

Appendix G:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

VISUAL IMPACT MITIGATION
(NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix G

Proposed Concepts for Visual Impact Mitigation

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

BLM	Bureau of Land Management
DPP	City and County of Honolulu, Department of Planning and Permitting
KLIP	Kapa'a Light Industrial Park
KOP	Key observation points are the most accessible, commonly used viewing locations.
NEPA	National Environmental Policy Act
Lower site	Lower portion of the project site in TMK 4-2-15:014
Upper site	Upper portion of the project site in TMKs 4-2-15:013 and 014

SECTION 1: OVERVIEW AND CONCLUSIONS

This report presents possible visual mitigation concepts that could be applied at the Kapa'a project site. The concepts presented do not present the final designs but rather guidance on what effective visual impact mitigation concept should be considered in the final design iteration.

While the entire Kapa'a Light Industrial Park is considered in the review of environmental impact, the focus of the present report is on the Lower portion of the site (Lower site). There are several reasons for this as follows:

- The Lower site is within in the SMA area and therefore requires increased impact mitigation.
- The Lower site is closer to adjacent viewpoints from where visual impact is experienced.
- The Lower site is closer to adjacent environmentally sensitive land.

The following issues are considered in assessing the visual impact and its mitigation:

- Landform, how the new development relates to the adjacent land and especially to the backdrop of the Koolau mountains.
- Key views on the project site from near distance and medium distance.

The main conclusions and recommendations are as follows:

- Camouflaging facilities, based on scientific research, is a relatively recent application and provides a range of opportunities to lower visual impact of developments such as the proposed development in the Lower site.
- The reviewed literature describes the application of camouflaging using texture and color to reduce the visual impact of facilities which are situated in sensitive and valuable view planes.
- Applying these camouflaging methods to the future development in the Lower portion of the project site (Lower site) represents significant beneficial to lower visual impacts from distance view.
- Using single-color camouflaging was found to be most effective for key views closer than ¼ mile and farther away than 1 mile. These key views coincide with the most prominent views such as (1) from intermittent views people experience passing the site on adjacent roadways, and (2) from continuous distant views across the Kawainui Marsh.
- The selection of color schemes of to lower the visual impact of \warehouses will be performed at a later point during the detail design phase.
- For more distant views, the planned development will be at a low elevation point against the towering background of the Koolau mountain range. This landform situation helps to conceal the new development using the visual impact mitigation methods presented in this report.
- Placing trees, shrubs, and other vegetation on the new site perimeter berms of the Lower site creates an effective screen for views from adjacent streets. This vegetation buffer creates not only an effective visual buffer but also has a range of other environmental benefits.
- The overall conclusion is that using innovative and conventional methods can significantly reduce the visual impact of the planned development in the Lower site. The Upper site causes less visual impact because of existing larger trees at its Eastern perimeter.

SECTION 2: GOVERNING RULES AND GUIDELINES

Visual resources refer collectively to the natural and manmade features, landforms, structures, and other objects visible from a single location or a broader landscape. Visual resources inspire the human experience of a landscape. Various aspects combine to create visual resources, such as color, contrast, texture, line, and form. Natural features, such as mountain ranges, ocean views, unique geological formations and shorelines and constructed landmarks including cultural resources are considered visual resources.

There are a few governing rules and guidelines related to visual impact mitigation. The relevant are listed in the following:

On a community and regional level, the Koolau Poko Sustainable Communities Plan discusses visual impact and resources as part of the vision for Ko'olau Poko's future development:

- The vision and plan for Ko'olau Poko focuses on the long-term protection of community resources, residential character, and the adoption of public improvement programs and development regulations that reflect a stable population. Significant scenic views of ridges, upper valley slopes, shoreline areas from major public parks highways, coastal waters and hiking trails are protected. Access to shoreline areas and mountainous regions are improved and provided for all to use and enjoy.
- Ko'olau Poko's striking topographic features, outstanding beaches and bays, lush valleys, perennial streams and other natural features and landmarks continue to visually define the "windward" sense of place. Views of ridgelines or upper slopes of coastal headlands and mountains from the vantage point of coastal waters, major roads, parks, and other public places, are kept free from land disturbance or the encroachment of structures or other projects that would affect the scenic view planes.

Federally owned land in Hawaii: While agency-specific guidelines for complying with National Environmental Policy Act (NEPA) typically require consideration of visual impacts, there is no overall federal regulation or methodology specifying how such impacts should be evaluated. The most comprehensive federal agency visual impact methodologies are the Forest Service's Scenery Management System and the Bureau of Land Management's Visual Resource Management System. Neither of these agencies manages land in Hawaii.

Hawaii State Lands: The Hawaii Environmental Policy Act (Hawaii Revised Statutes, Chapter 343) and Hawaii Administrative Rules (Chapter 11-200) require state-level Environmental Impact Statement documents to consider visual impacts. These regulations do not provide specific methodology for evaluating visual impacts.

County Regulations: Outside of federal lands, county land development and zoning ordinances provide some regulation of visual resources in Hawaii. These ordinances govern the type, height, bulk, and density/intensity (i.e., number of housing units per acre or non-residential floor area ratio) of development.

SECTION 3: COMPONENTS AND FEATURES OF VISUAL IMPACT

This section presents general approaches on how visual impacts is created by developments and how observers of developments are affected.

Elements of the landscape

Visual impacts depend on how the new development relates to the surrounding landscape. Describing a landscape before and after the development allows these visual impacts to be assessed. Trying to capture the range of factors that make up an attractive landscape or a beautiful building is difficult and often depends on a viewer's personal taste.

Visual impacts depend on physical elements such as:

- Topography or landform (hills and slopes).
- Vegetation.
- Buildings
- Other land uses.

These individual elements need to work together to contribute to the character of the whole landscape.

Visual components

Physical elements structure a landscape, and visual components provide a framework for the description of the landscape.

Four basic visual components are frequently used. These are form, line, color, and texture:

Form describes the shape of something, so hills may be rounded, jagged or rolling. Groups of buildings may be dense and regular, with a strong geometric pattern, or may have a less defined shape. An earth dam may be massive and bulky and match the surrounding hills, but the clearly defined engineered shape of a concrete arch dam contrasts with natural landforms.

Line considers boundaries and demarcation between areas. A rectangular block of trees planted on a hillside has a different appearance from an area of woodland that merges to scrubland and then open grassland with no distinct border. Variation of skylines affect the perception of landforms. An example is the perception of a development in front of either a mountainous skyline or a visible horizon. If tall buildings do not break the skyline, the mountains in the background dominate. However, if the buildings obscure the hills, the development is perceived as dominant.

Color is an obvious aspect of a sight, with the hue of vegetation, bare earth or water being noticeable aspects. Contrasting colors may make certain features stand out and bring them to the viewer's attention. Uniformity in color may be unexciting. Color can be extended to include more subtle details, such as areas of light and dark. Background, background lighting, shadows, sunlight, and reflections can alter the perceived colors.

Texture reflects the nature of surfaces. This may be uniform or varied, smooth or rough. Turbulent water can be dramatic, whereas a smooth pond is calming and promotes contemplation. The

appearance of a woodland with many different species, sizes and ages of tree is different from a plantation of the same species.

The four basic visual components are affected by several factors:

Variety: The four visual aspects may be uniform or may vary. There is no simple explanation of how much variation is good. Some developments may have buildings all the same style and have a pleasing harmony. Other uniform development may be dull and drab, having no variety.

Perceptions: The value of a scene to an individual generally depends on personal perceptions and preferences. What is attractive to one person may not be to another.

Tranquility may be valued by some observers, who prefer a harmonious landscape. Other people may prefer a lively development of an urban setting. Some people value natural landscapes, or what they perceive to be natural landscapes, over areas where the influence of humankind is dominant. In general, personal perspectives and preferences are motivated by culture, upbringing, familiarity, literature, and other issues. Groups of people will share a 'sense of place', where a landscape has a particular character that they value and can recognize. It may be that the area is familiar from previous experiences. The visual value of a place, development or landscape is also based on the shared experience of a community and society.

Other considerations: Visual appearance can also be influenced by other issues such as the benefit to society. Industrial and commercial developments bring employment and economic development. Therefore, the change a development affects in landscape may be accepted and even valued as a sign of progress. These developments can even become accepted as part of the landscape. Some landscapes are more sensitive than others. If an area has a strong, uniform character, then additions that do not reflect the nature of the site may stand out. A diverse and varied landscape, however, may be able to accommodate new features more easily, without disrupting the overall feel of the place.

Landscape features

When assessing a landscape for its visual characteristics, there are various features that can be identified.

Vistas and viewpoints are notable points from where the landscape can be observed. The vista comprises the location of the viewer and the view they can see from that point. The vista might be elevated above the surrounding area, so the viewer can see a long way. The vistas might be easily accessible, from a road or from a park, for example. They may offer a view that is obscured and screened elsewhere. Vistas might allow the wider environment to be observed. Shorelines and open areas allow people to see buildings from a distance.

Barriers and screens are the opposite of vistas, since they obstruct a view. Rolling hills, buildings and tall vegetation may restrict views of some areas. The areas that are screened will therefore have a different visual value than an area that has the same quality of scenery but can be seen more easily.

Dominance may be apparent in certain features that have a strong influence over the surrounding area or are particularly prominent. The Koolau mountain range, for example, is the dominant feature for the windward area around Kailua and Kaneohe.

The following Table 3.1 describe the visual quality of landform and vegetation elements:

Table 3.1: Landscape attributes (source: Swanwick, C. (2002); modified to apply to the Kapa'a project site)

	Scenic quality		
	High Medium Low	High Medium Low	High Medium Low
Landform	High / steep Isolated Focal points Distinctive/ unusual Complex Incised Strong valley form; (e.g., "V" or "U") Cliffs Ridges Color contrast	Rolling Rounded Broad valleys Shallow gorges Small rock outcrops Regular	Flattish No dissections No definition
Vegetation	Strongly defined. Natural edges Mix of vegetation within communities. Combinations of vegetation types Dramatic seasonal color Different shapes and sizes, some tall Irregular	Indistinct patterns Large clearings Coarse texture Slight variations Medium	Large areas of similar vegetation No discernable patterns

SECTION 4: BASIC MITIGATION APPROACHES

The discussion in the previous Section 3 describes components of visual impact. This Section 4 describes what general concepts can be applied to create visual impact mitigation.

Since the development at the Kapa'a Light Industrial Park (KLIP) is defined in location, form of structure and site layout, the following basic development concepts can be used to lower the visual impact:

- Sensitive areas which should be considered include skylines and ridges on hills. Objects that stretch over the skyline and are thus noticeable against the sky emphasize the form of intrusions.
- Effective screening is offered by wider vegetated screens, such as buffer zones. These buffer zones introduce changes of the landform as it is merged slowly into the surrounding countryside.
- The appearance of the development can be altered to make its form, color, texture, and especially its height, less intrusive.

The following three basic visual mitigation methods will be used at the project site:

- Using vegetation around the site perimeter to create a buffer zone around the project site to screen the development from key vistas.
- Using vegetation inside the project site provide visual variety.
- Using color and texture to mask the buildings or blend them into the adjacent environment .

Since the use of vegetation as visual impact mitigation is readily understood and often applied, the following Section 5 will provide some information about using color and/or texture as effective visual mitigation methods for developments.

SECTION 5: COLOR AND TEXTURE FOR VISUAL IMPACT MITIGATION

Balancing the need for development and the protection of natural, cultural, and scenic resources requires effective strategies to minimize impacts to visual resources. One more recently used approach is to mask developments with the help of visual elements.

The use of visual concealment techniques on buildings is relatively new as a design application of structures. While use of color and texture applications for military has a long application history, there have been few studies concerning its applicability for minimizing impacts to visual resources on the natural landscape (BLM, 2015). The methods described in this sections present findings and recommendations based on a 11-year BLM study to test the effectiveness of patterns, colors, and application methods for minimizing visual impacts associated with public land-use development.

Modern visual concealment technology has its roots in the art community as well as in the military. Early applications of visual concealment date back to 1898, applying it to naval vessels. Further development yielded dazzle textures combined with paint pattern, whose objective was not to hide but to disrupt the form of naval warships and confuse the enemy about the ship's critical target points through deception. Subsequent developments expanded the use of visual concealment of structures. Additional patterns were developed and applied to not only ships, but also to uniforms, aircraft, and vehicles.

Much like this early application, some current visual impact mitigation techniques are used to break up the geometric form of facilities, using highly contrasting colors to mimic the patterns of light and shadow in the landscape (BLM, 2015).

For certain applications visual mitigation of facilities use multiple colors are applied in an organic pattern that replicates natural textures, breaking up the form of an object. The colors of the pattern should repeat the colors seen in the surrounding landscape—including the shadows—to create the illusion that the object is part of its surroundings. For other applications simple colors are effective as visual impact mitigation.

The developers of the BLM visual resource management method described that vision provides a conduit of experiences, as we collect and store information that communicates place and influences our experience. This visual information of an object or landscape setting can be categorized into five elements: form, line, color, texture, and scale. The incompatibility of certain facilities in a landscape setting could upset the visual senses and may negatively impact our perception of the visual setting. By modifying the form, line, color, and texture to mimic the visual characteristics of the surrounding natural environment, the visual impacts of intrusive structures can be diminished. Repeating colors and textures of the surrounding landscape can help minimize the visual contrast of facilities and structures.

The Five Elements of Visual Information are described as follows:

- **Form** is defined as the mass or shape of objects in the landscape.
- **Line** is the real or imagined path the eye follows when viewing the landscape.

- **Color** is the major visual property of reflecting light of a particular intensity and wavelength from surfaces and creates the visual contrast of the landscape.
- **Texture** is the aggregation of small forms or color mixtures into a continuous overall surface pattern of objects, often vegetation, in the landscape.
- **Scale** is the proportionate size relationship between an object and the surroundings in which it is placed.

In sensitive landscapes where development may compromise a valuable visual resource, or where distance and siting alone are not sufficient to conceal facilities, it may be necessary to apply a single color or a multicolor texture treatment to meet the visual resource management objectives.

The application of color and texture is not limited only to sensitive landscapes but should also be considered in any situation where development could cause significant changes to the visual character of the landscape.

The following sections provide guidance to aid in the selection and application of color and texture on facilities, while providing examples of successful uses. In some cases where the guidelines are applied to facilities a simple single-color application is sufficient to greatly reduce the visual impact of a facility. This is especially true on linear elements, such as transmission facilities, and on facilities in landscapes with little variation in texture and color. As a general rule, the effectiveness of visual impact mitigation is greatly dependent upon the color and texture of the surrounding. Figure 5.1 shows an example of the use of a multi-color textured surface of a building structure within a scenic sensitive location.

Figure 5.1: Use of visual impact mitigation for structures and facilities

Using textured surface application is effective for visual impact mitigation when multiple colors are applied in an organic pattern that replicates the natural textures, thus breaking up the form of an object. The colors of the pattern should repeat the colors seen in the surrounding landscape—including the shadows—to create the illusion that the object is part of its surroundings, both positive and negative space. The image on the left provides an example of how multi-color textures on surfaces break up the form of a building and blend it into the surrounding . (Source BLM, 2015)

Using Single-Color versus Multiple-Color visual impact mitigation applications

The single-color treatment is the most conventional and the most affordable practice for reducing adverse visual impacts. In most circumstances, this treatment will likely produce acceptable results in visual impact reduction. However, there are circumstances when this level of treatment does not produce the necessary results. In these cases, use of single- or multi-color texture treatments to properly lower the impact may be warranted.

Heightened areas of sensitivity may be found in the proximity (1 mile or less) of historic sites and landmarks, national scenic and historic trails, and culturally significant landscapes and within scenic vistas from communities and neighborhoods.

Since multiple-color textures surface applications mimic the landscape's texture on untextured facilities, the effectiveness diminishes over a range of distance. The concealed structure will begin to blend into a single perceived color when viewed from more distant locations, while color variation in the textured landscape remains visually apparent**. Textured concealment treatment is more effective when the observer's position to the treated facility is within a range of ¼ mile to 1 mile. (**BLM, 2015)

Single-color treatments will likely produce the best results in fine-textured landscapes with little color variation, whereas multiple-color textured surface application will render enhanced results in landscapes with greater levels of color variation coupled with medium to coarse textures. Textured surface treatments also work well in single-color landscapes with coarser textures. A single-color treatment with a darker shade might produce the best results for the least investment.

Single colors should be selected using the standard color chart, such as the BLM Standard Environmental Color Chart (BLM, 2015) as a guide. The color chart provides standard paint color chips that can be taken to any paint provider to ensure true color matching. The chart also includes general guidance on color selection for multiple types of landscapes.

A facility is a candidate for multiple-color texture patterns treatment if it is within a mile of the key observation points (KOP), if the surrounding landscape has special scenic values and/or cultural landscape sensitivities, or if the landscape has a medium to coarse texture. The objective is to effectively minimize color contrast between the facility and the natural landscape character.

When applying surface treatment applications for visual impact mitigation off-the-shelf commercial patterns should be avoided. Contractors who use creative artistic features to treat a facility could cause ineffective applications. Creating a greater level of contrast could draw the observer's attention to the facility, which would negate the desired effect.

Single- or multicolor texture applications are most successful at distances between 650 feet and ¾ mile; at closer distances, such textures may make facilities stand out, while a single-color application may be just as successful for facilities further away than a mile. (BLM, 2015).

Based on the distances of the facility from the KOPs, the scale of the standard pattern may need to be adjusted to maximize results. The general rule of thumb is that the further the distance, the greater the scaling of the texture.

The primary reason texture effectiveness drops off beyond 1 mile is largely because most facilities being treated have smooth untextured surfaces, whereas the surrounding landscape contains true three-dimensional texture. Increasing the pattern scale when facilities are placed at greater distances may help compensate for the lack of true texture and extend the range of effectiveness.

The goal of using texture surface applications is to mimic the balance of light and dark, or contrast, in the surrounding environment. Textured surface applications, where multiple KOPs are within the effective ¼ mile to 1 mile range for from the location of the development, create the need to decide on what pattern scale to use. This means, to adjust the pattern scale to favor the results from a KOP that is within proximity or whether to compensate for a more distant KOP.

Recommendations for Using Color for Visual Impact Mitigation

Using color to mitigate the visual effects of development can provide a relatively simple, cost-effective solution. The following process steps are recommended:

- Select key observation points (a minimum of ¼ mile from the project area).
- Determine the primary viewing distance. Will the facility be less than 1 mile away from the KOPs or more than 1 mile away?
- Single-color treatments usually work best for facilities less than ¼ mile away or more than 1 mile away and in fine-textured landscapes with little color variation.
    - If using a single-color treatment: Conduct a field study to select three to four colors and evaluate their performance.
- Multiple-color texture treatments usually work best for facilities between ¼ mile and 1 mile away and in medium-to coarse textured landscapes.
    - If using a multiple-color texture treatment: Either use the standard texture pattern or create a custom pattern; adjust the scale to maximize results; select colors with a mixture of light and dark tones.

Figures 5.2 and 5.4 show examples of using single-color as visual mitigation of structures located on high value scenic context.

Figure 5.2: Darker single color applied to tank (Source, BLM 2015)

Single-color application successfully minimizes visual impact.
With single-color application, darker colors recede into the landscape while lighter colors tend to stand out. Colors a shade or two darker than the predominant color in the landscape, should be used to help reduce the effects of fading over time.

Figure 5.3: Dark shade of green to blend the structure in with the surrounding vegetation. (Source, BLM 2015)

With single-color application, darker colors recede into the landscape while lighter colors tend to stand out. Colors a shade or two darker than the predominant color in the landscape, should be used to help reduce the effects of fading over time.

SECTION 6: KEY VIEWS ON THE KAPA'A PROJECT SITE

Two key views were chosen to evaluate candidate view resulting from the development in the Lower site. The locations of the key views were chosen based on locations that are accessible to the public, including residential locations. Table 6.1 describes the two key views considered.

Table 6.1: Definition of 2 Key Views

Key View	Location of Views	Viewer Type	Distance to Lower site	Defined in Figure
1	Views from the Kapa'a Quarry Road and the Kapa'a Quarry Place to project site	Customers, Commuters, Recreational	<1/4 mile	6.1
2	Views from several locations around the Kawainui Marsh	Residents Commuters Recreational	>1 mile	6.2 and 6.3

Figure 6.1 shows the shaded area which represents the locations of key views which are visible to citizens and employees from the adjacent roadway system, thus within a ¼-mile distance. This is identified as Key Views 1.

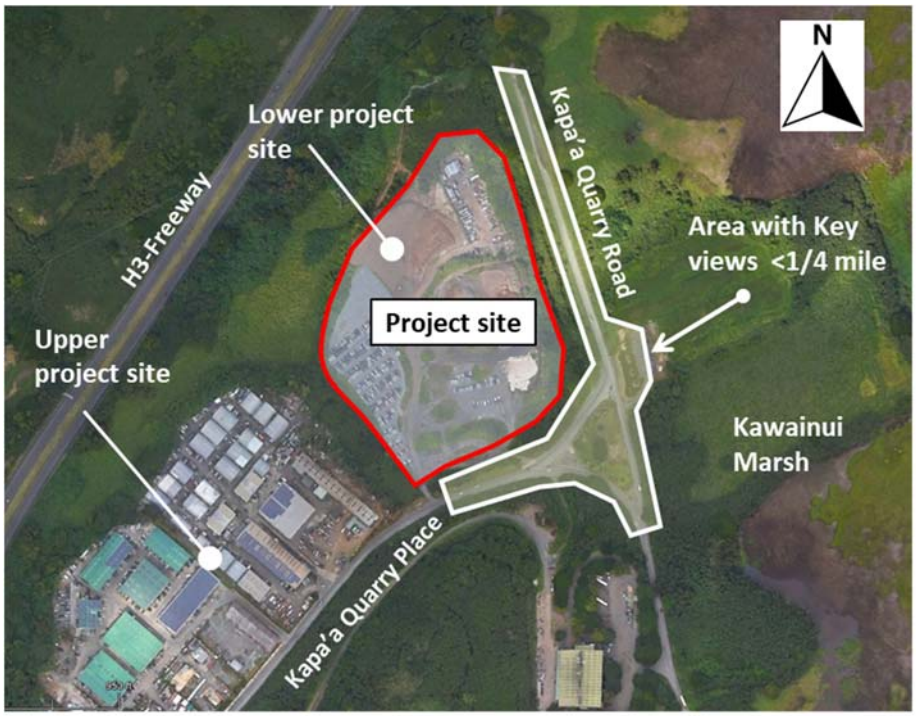

Figure 6.1: Definition of Key Views 1

The shades area indicates the locations of Key Views 1.
All views within the indicated shaded area are within ¼ mile from the nearest objects inside the site perimeter.

Figure 6.2 and 6.3 shows the locations of the Key Views 2, which have distances between 0.5 and 1.5 miles from the project site. Figure 6.2 is from the Koolau Poko Sustainable Communities Plan and indicates the project site and the extent of the inset detail which is shown in larger scale in Figure 6.3.

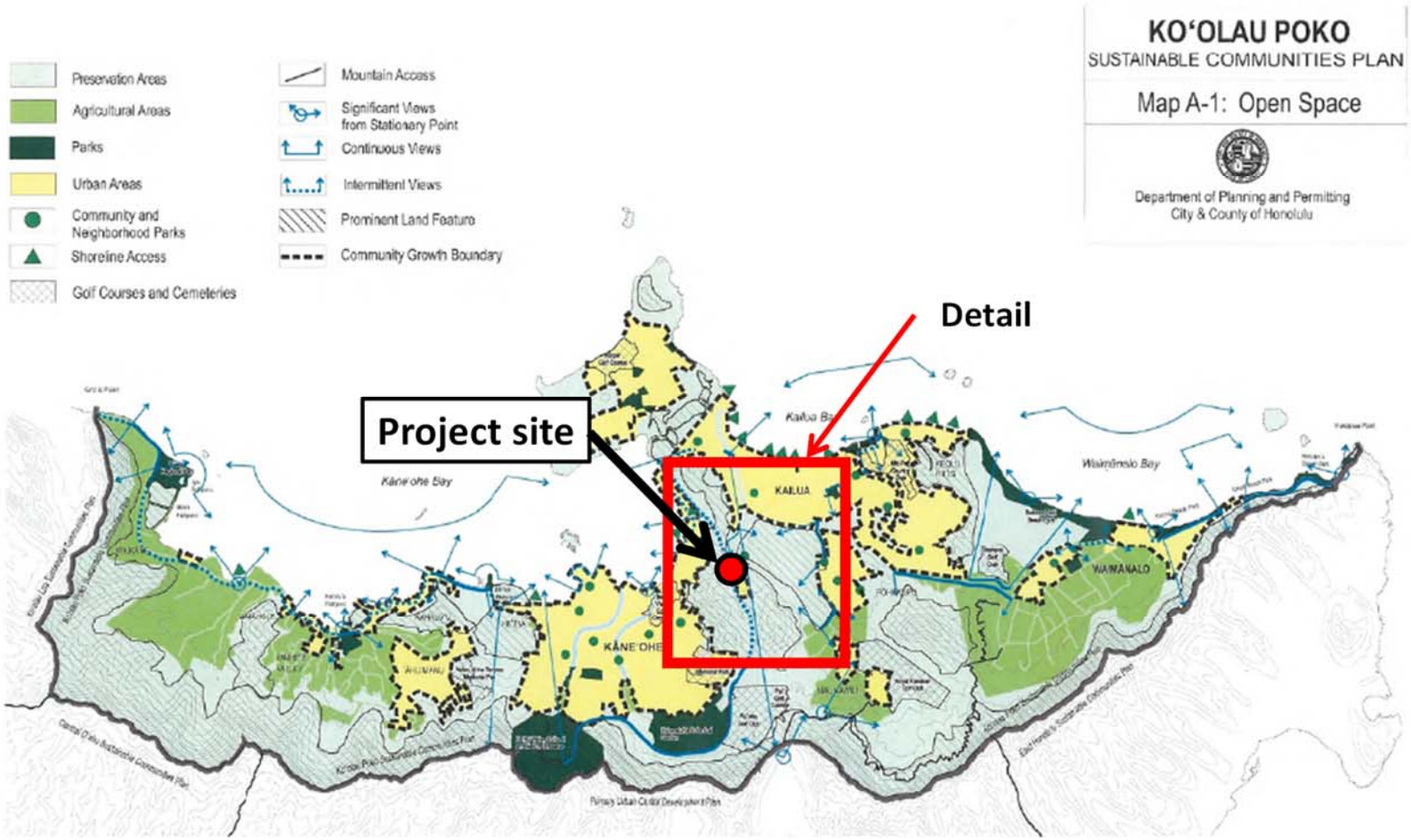

Figure 6.2: Map from the Koolaupoko Sustainable Communities Plan (Source DPP, Koolaupoko Sustainable Communities Plan, annotated)
Note: the red boundary shown indicates the extent of the of the detail shown in Figure 6.3

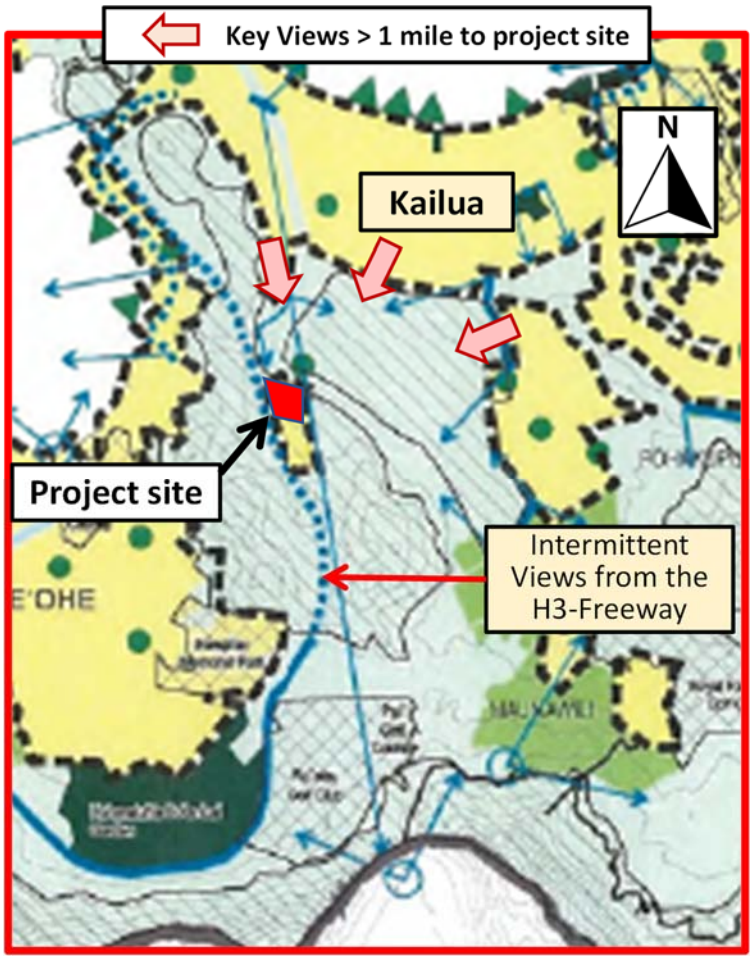

Figure 6.3: Details defined in Figure 6.2.

Legend:

- The red shaded arrows in the figure were added to the image to emphasize the main key views from the perimeter of the Kawainui Marsh towards the project site.
- The blue arrows are shown in Map A-1 of the Koolaupoko Sustainable Communities Plan (Figure 6.2)
  - The blue solid arrows indicate continuous views, thus from stationary viewpoints.
  - The blue dashed arrows indicate intermittent view from people inside cars passing the project site on the H3-Freeway

(Source DPP, Koolaupoko Sustainable Communities Plan, annotated)

Figures 6.4 through 6.7 show samples of existing key views as indicated in Figure 6.3.

- Figure 6.4 shows a view a stationary location at the Eastern perimeter of the Kawainui Marsh. The View is towards the South. Indicated in Figure 6.4 are the existing Kapa'a Transfer Station and the existing Upper portion of the project site (Upper site). The project site blends into the background of the towering Koolau mountain range.
- Figure 6.5 shows an intermittent view of the project site from a car occupant traveling South-West bound on the H3-Freeway. Figure 6.5 indicates the existing Upper portion of the project site (Upper site). The project site blends into the background of the towering Koolau mountain range.
- Figure 6.6 shows an intermittent view of the project site from a car occupant traveling North - West bound on the H3-Freeway at the Mokapu Blvd. down ramp. The project site is hidden behind a dense vegetation perimeter screen along the roadway.
- Figure 6.7 shows an intermittent view of the project site from a car occupant traveling North bound on the H3-Freeway. The project site is hidden behind a dense vegetation perimeter screen along the freeway East perimeter.

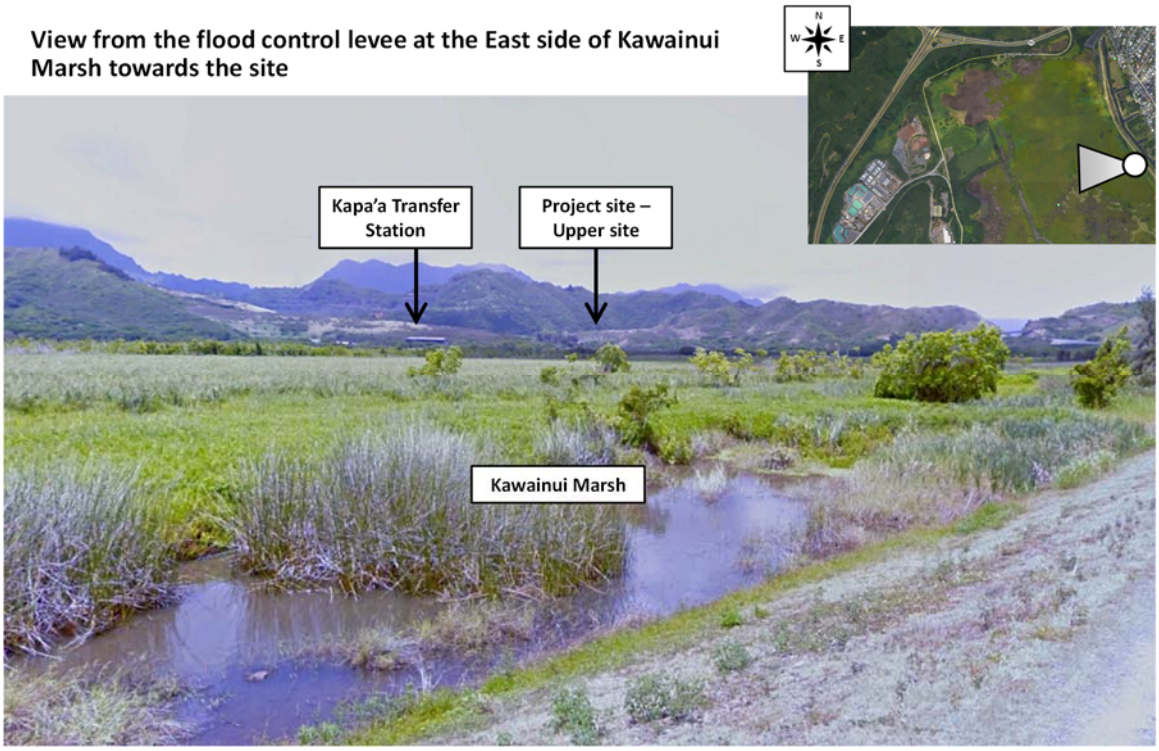

Figure 6.4: View from a stationary location at the Eastern perimeter of the Kawainui Marsh

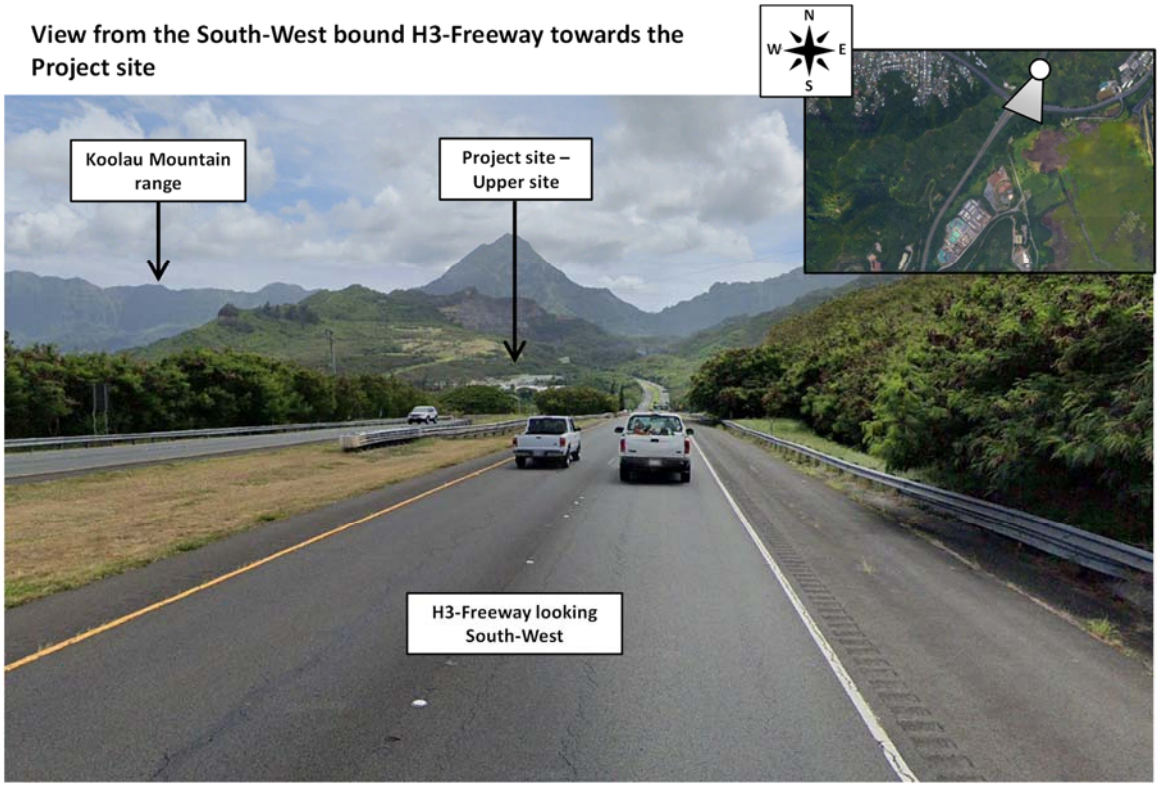

Figure 6.5: View from the South-West bound H3-Freeway towards the Project site

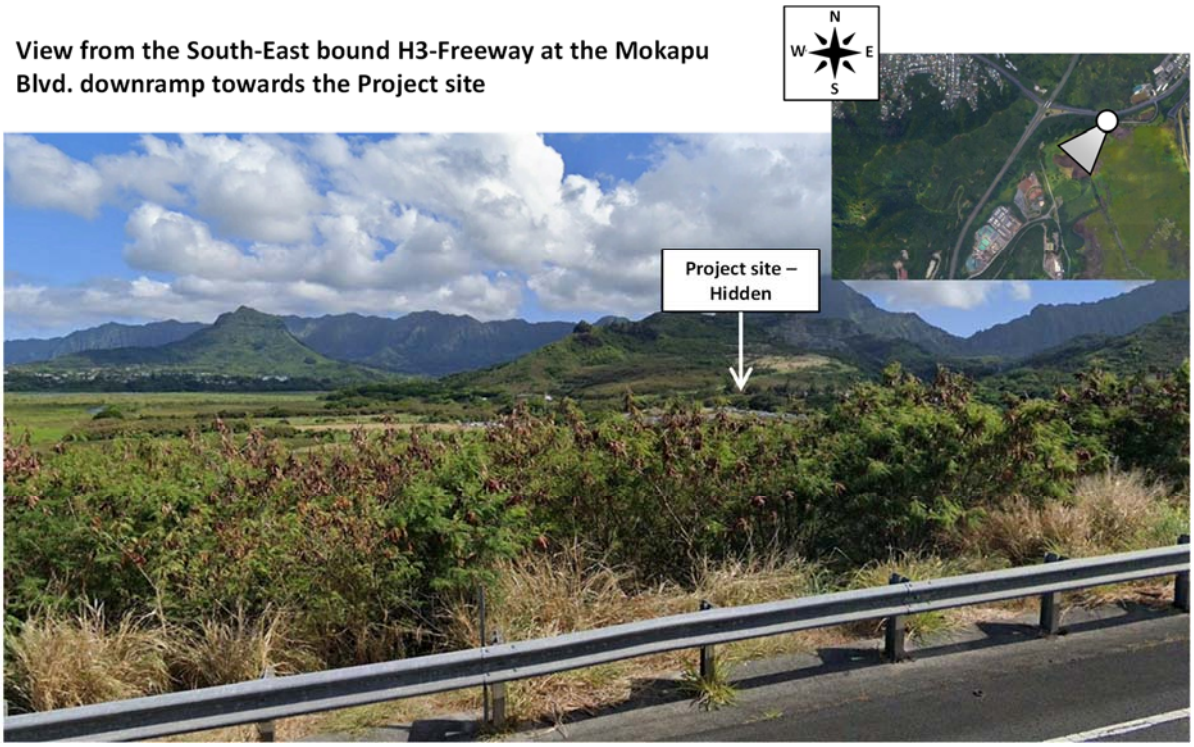

Figure 6.6: View from the South-East bound H3-Freeway at the Mokapu Blvd. down ramp towards the Project site

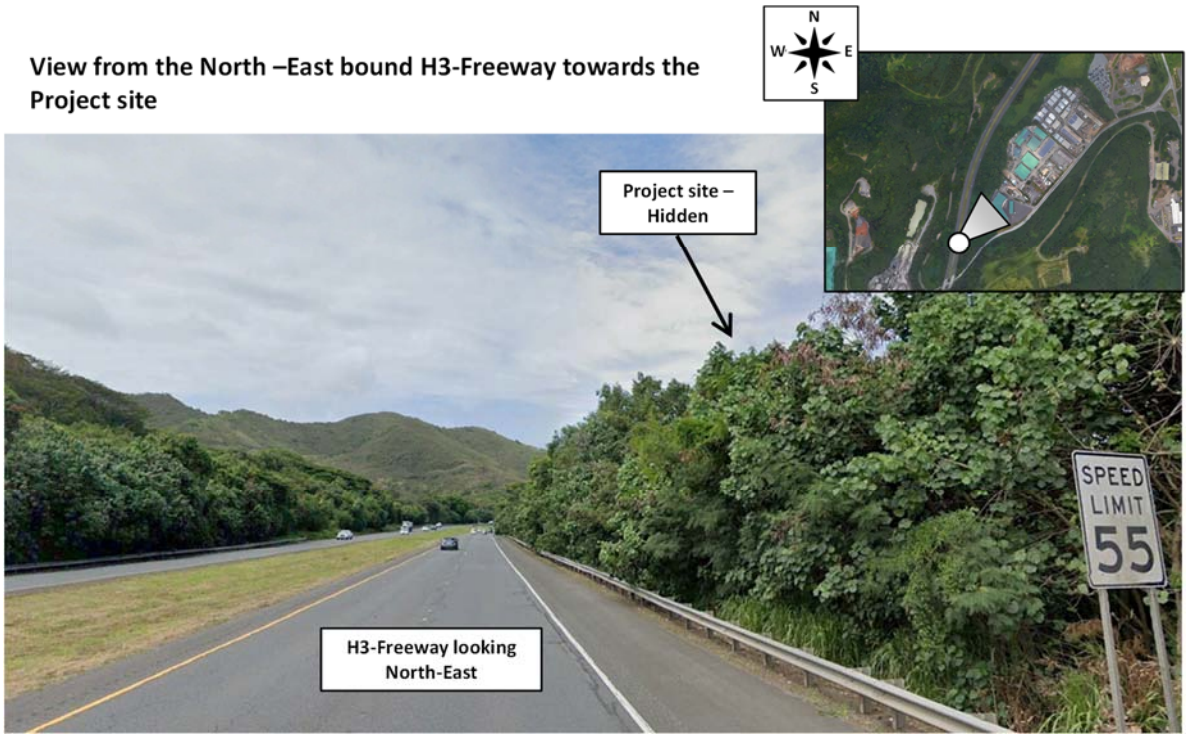

Figure 6.7 View from the North–East bound H3-Freeway towards the Project site

Figure 6.8 shows the exiting Lower site and a portion of the existing Upper site. The Lower site is shown as partially graded and its present use as outdoor storage. Figure 6.8 defines the views shown in Figures 6.9 through 6.11. Figures 6.9 through 6.11 show intermittent views of the project site from a car occupant passing the project site at a close distance on the Kapa'a Quarry Road.

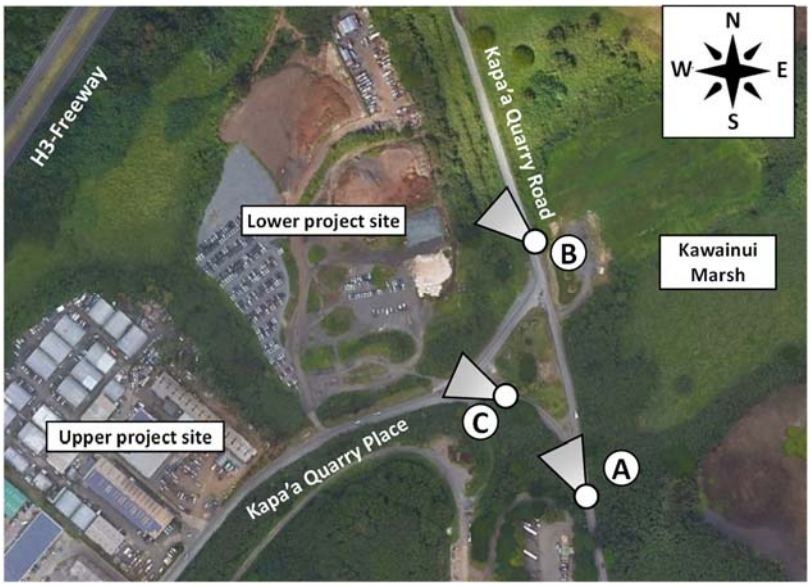

Figure 6.7 View from the North–East bound H3-Freeway towards the Project site

View A: From the North bound Kapa'a Quarry Road towards the Project site

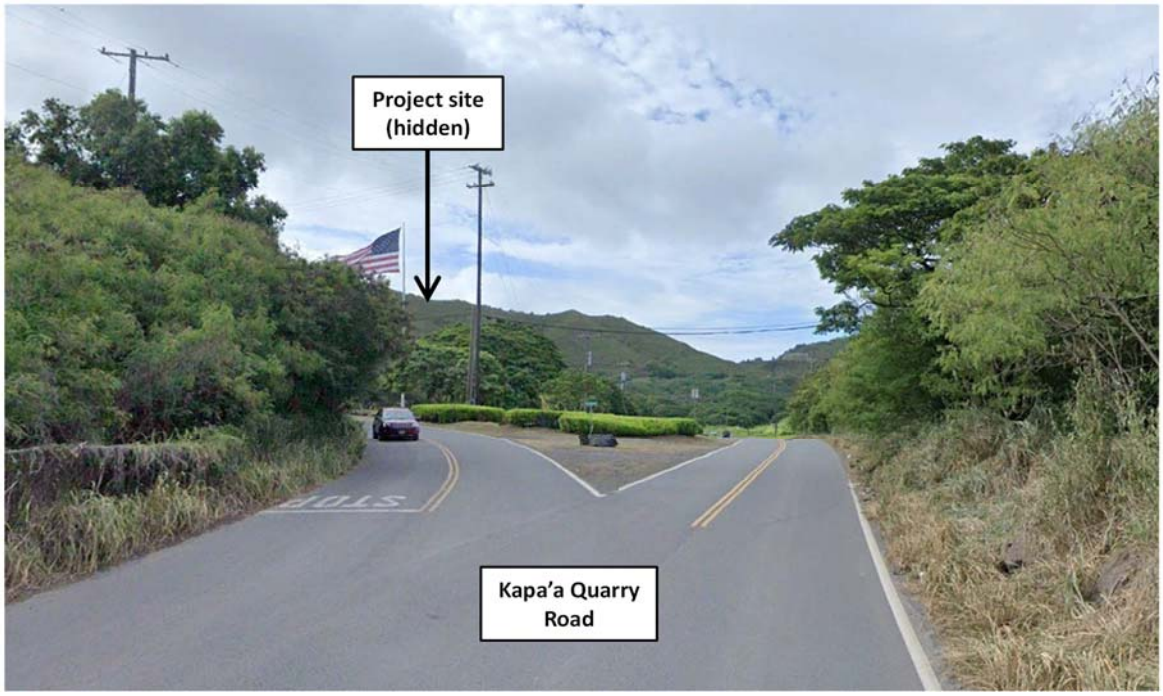

Figure 6.9: View A: From the North-bound Kapa'a Quarry Road towards the Project site

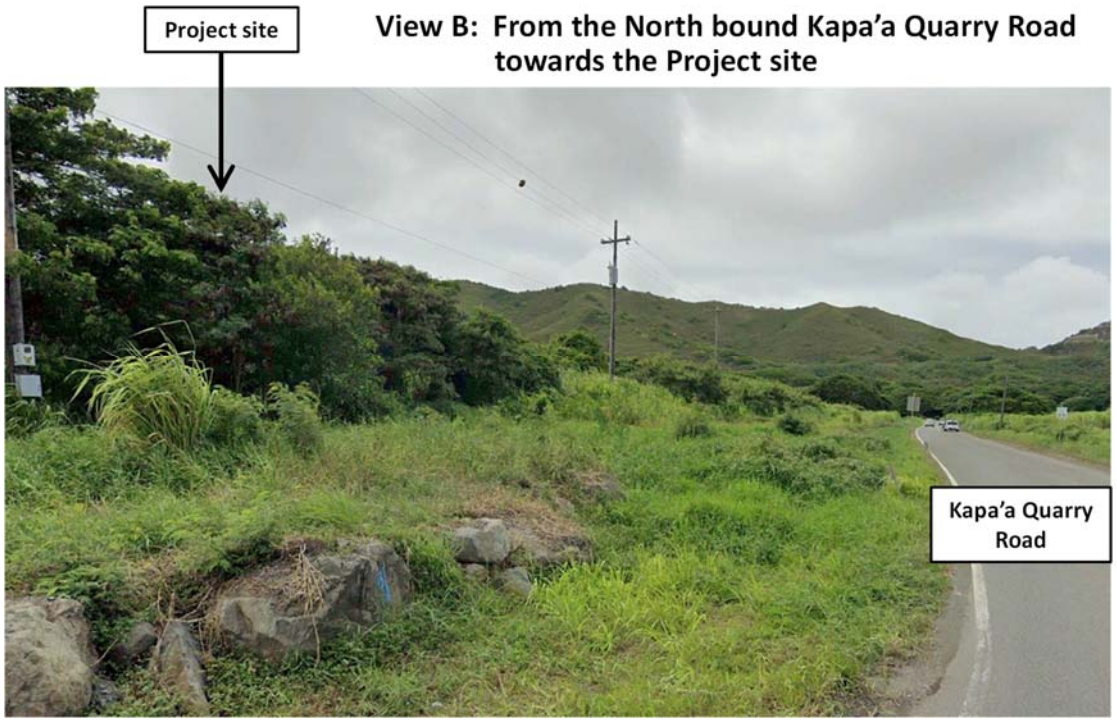

Figure 6.10: View B: From the North-bound Kapa'a Quarry Road towards the Project site

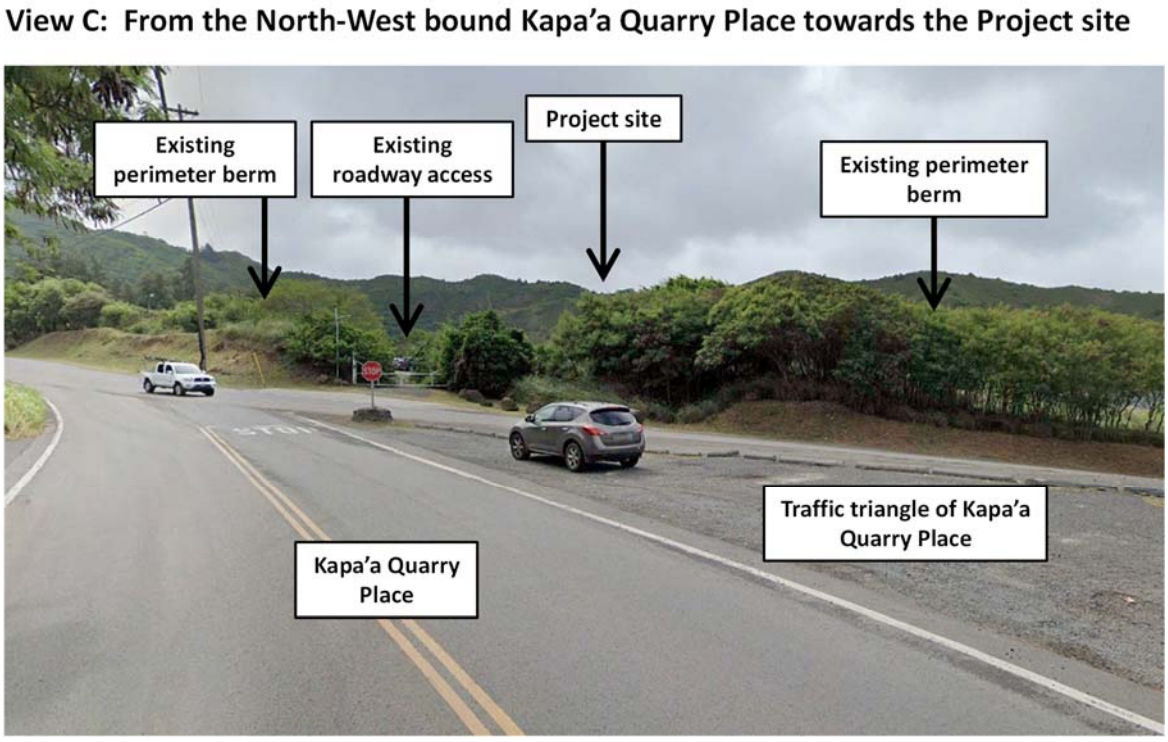

Figure 6.11: View C: From the North-West bound Kapa'a Quarry Place towards the Project site

SECTION 7: REDUCING VISUAL IMPACT FROM ADJACENT ROADWAYS

This section presents visual impact of near distance views from roadways adjacent to the Lower site. Vegetated buffers, composed of trees and shrubs, planted on the new earth berms of the Eastern site perimeter will be used to screen the buildings inside the Lower site from people passing the project site on the Kapa'a Quarry Road and the Kapa'a Quarry Place.

The efficacy of the planned vegetated buffer around the Eastern site perimeter to reduce the anticipated visual impact of the development is illustrated in a series of representative cross sections through the new site perimeter berms, which contains the vegetation.

Figure 7.1 shows the location of six representative cross-sections with illustrations of line of sight, as they relate to visual impact with and without the added vegetation on the perimeter berms. The representative cross-section A though F, shown in Figures 7.2 through 7.13 illustrate visual impacts of building with and without a trees and shrubs planted on the new perimeter berms.

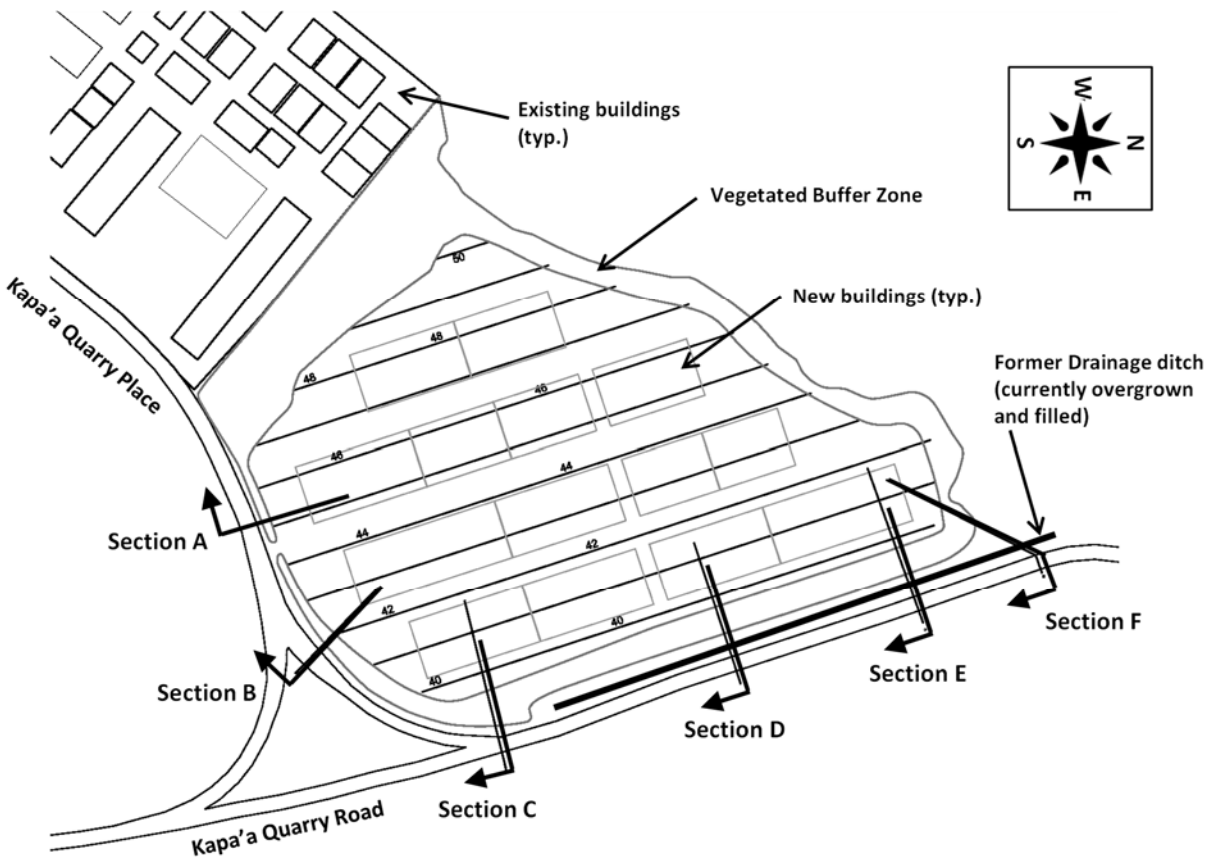

Figure 7.1: Locations and orientations of six representative cross section through the proposed site perimeter berm

Section A: Figure 7.2 and 7.3 show the cross-section A with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.2 indicates that without a continuous vegetation screen on the new perimeter berm the closest new warehouse would have no visual barrier and could be seen from the roadway in its entire elevation. There are plans to plant trees along the side of the warehouse but that would only partially reduce the visual impact.

Figure 7.3 shows that vegetation on the new site perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 15-foot trees could shield the view below the line of sight that intersects with the top of the warehouse structure.

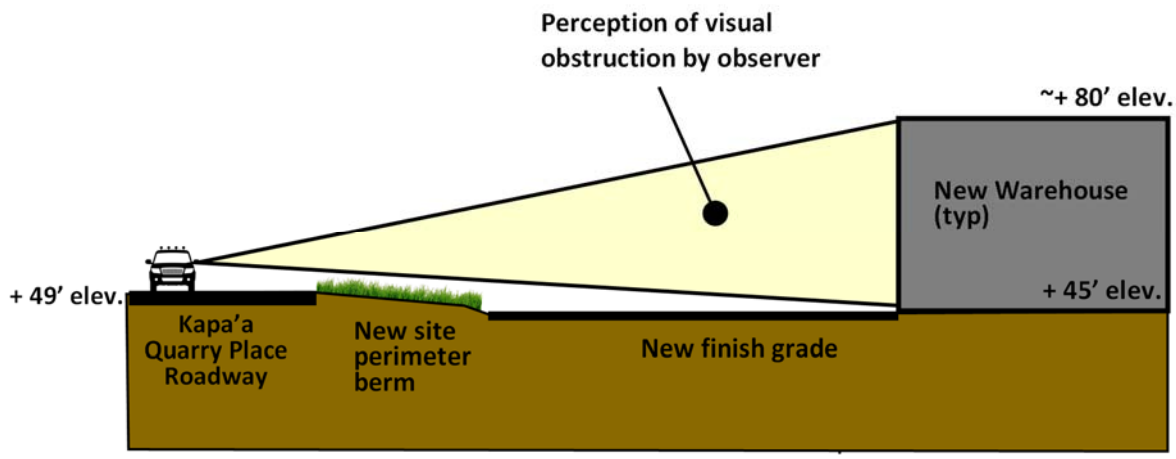

Figure 7.2: Cross-section A without trees on the new site perimeter berm (section drawn to scale)

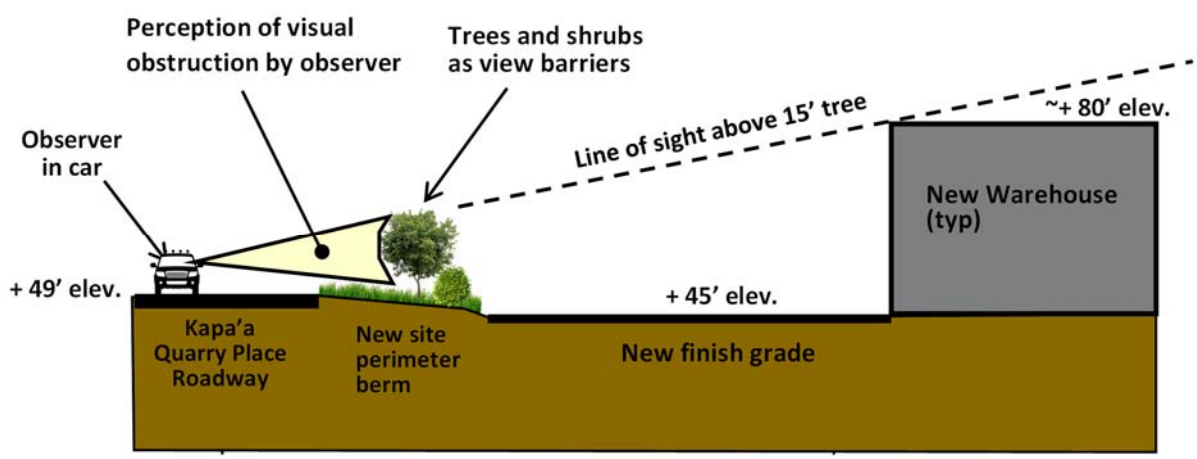

Figure 7.3: Cross-section A with trees on the new site perimeter berm (section drawn to scale)

Section B: Figure 7.4 and 7.5 show the cross-section B with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.4 indicates that without continuous vegetation screen, including trees and scrubs, on the new perimeter berm the closest new warehouses would be noticeable from half of their elevation upwards.

Figure 7.5 shows that a continuous vegetation screen, including trees and scrubs, on the new perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 12-foot trees could shield the view below the line of sight that intersects with the top of the warehouse structure.

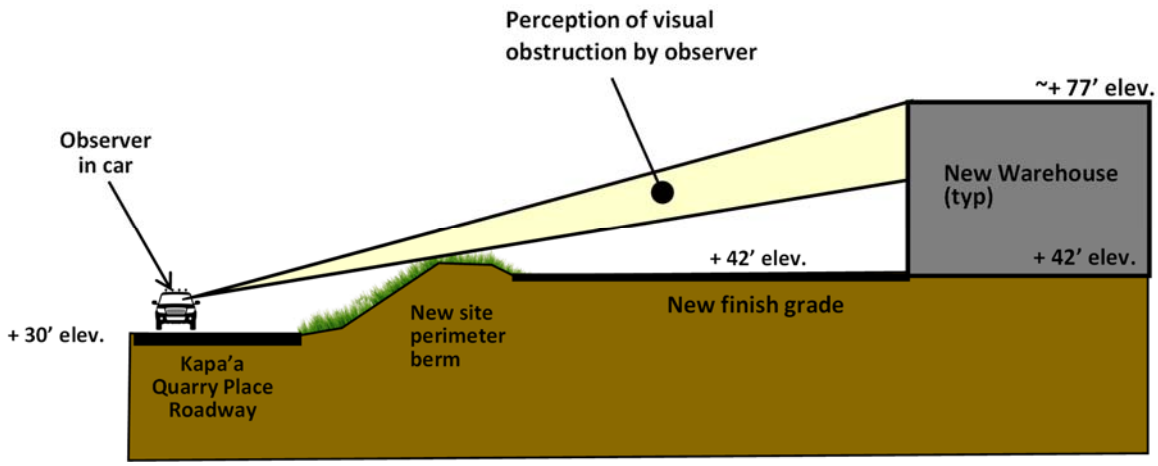

Figure 7.4: Cross-section B without trees on the new site perimeter berm (section drawn to scale)

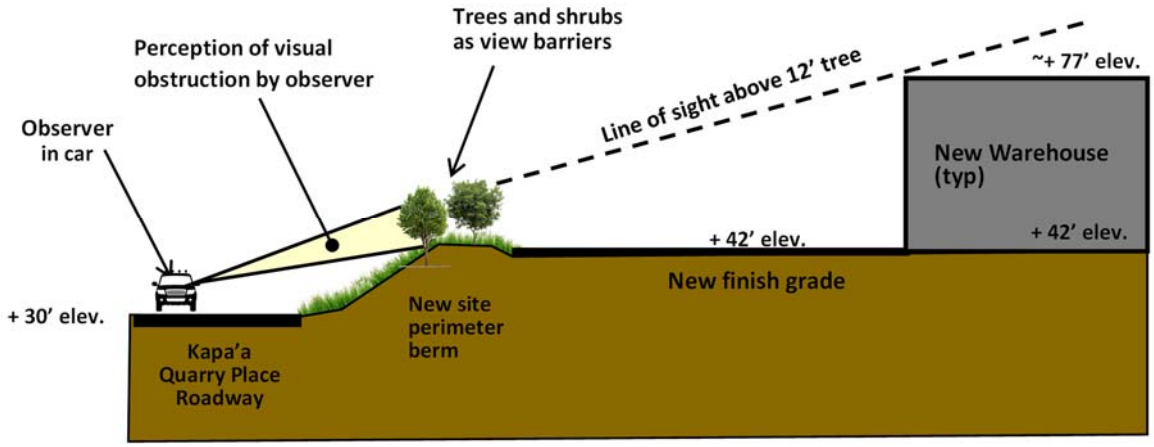

Figure 7.5: Cross-section B with trees on the new site perimeter berm (section drawn to scale)

Section C: Figures 7.6 and 7.7 show the cross-section C with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.6 indicates that without continuous vegetation screen, including trees and scrubs, on the new perimeter berm the closest new warehouses would be noticeable for about the upper third of their elevation.

Figure 7.7 shows that a continuous vegetation screen, including trees and scrubs, on the new perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 10-foot trees could shield views below the line of sight that intersects with the top of the warehouse structure.

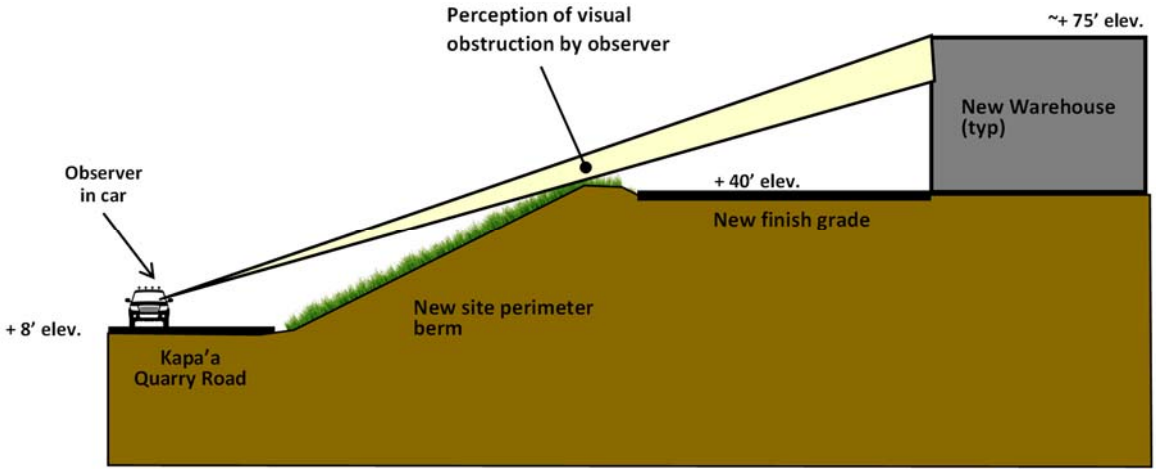

Figure 7.6: Cross-section C without trees on the new site perimeter berm (section drawn to scale)

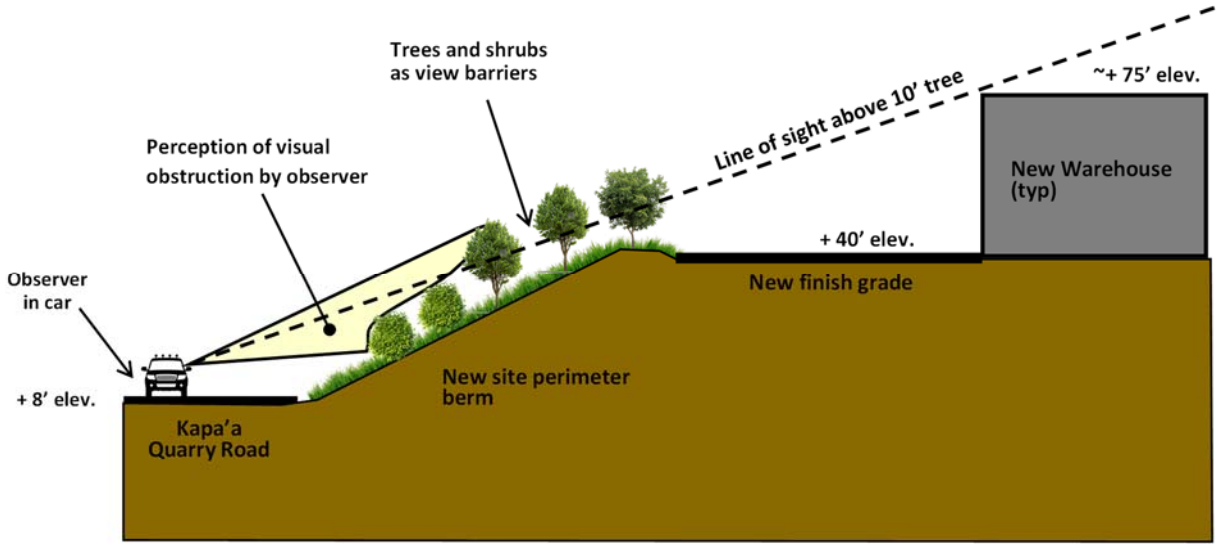

Figure 7.7: Cross-section C with trees on the new site perimeter berm (section drawn to scale)

Section D: Figures 7.8 and 7.9 show the cross-section D with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.8 indicates that without continuous vegetation screen, including trees and scrubs, on the new perimeter berm the closest new warehouses would be noticeable for about the upper third of their elevation.

Figure 7.9 shows that a continuous vegetation screen, including trees and scrubs, on the new perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 15-foot trees could shield views below the line of sight that intersects with the top of the warehouse structure.

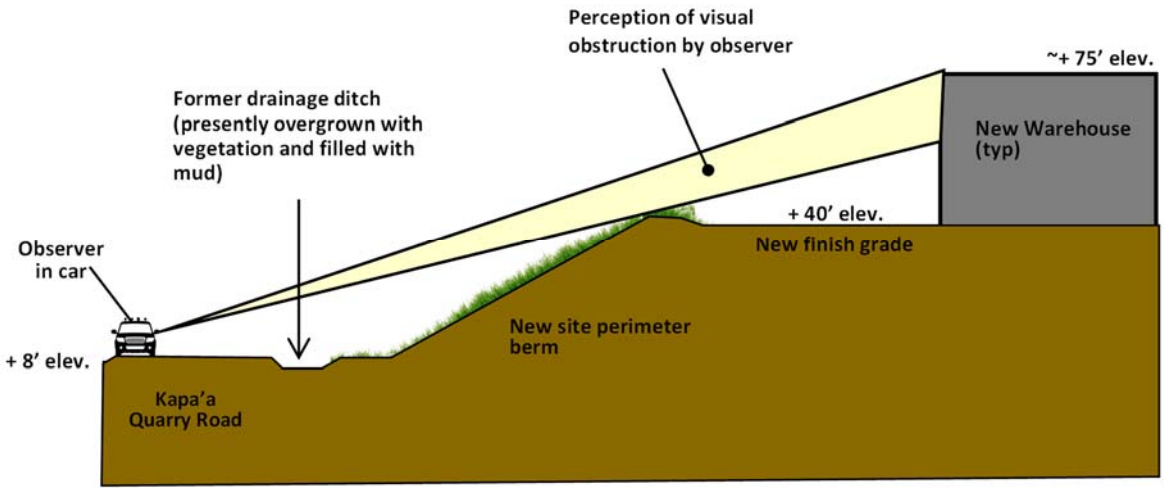

Figure 7.8: Cross-section D without trees on the new site perimeter berm (section drawn to scale)

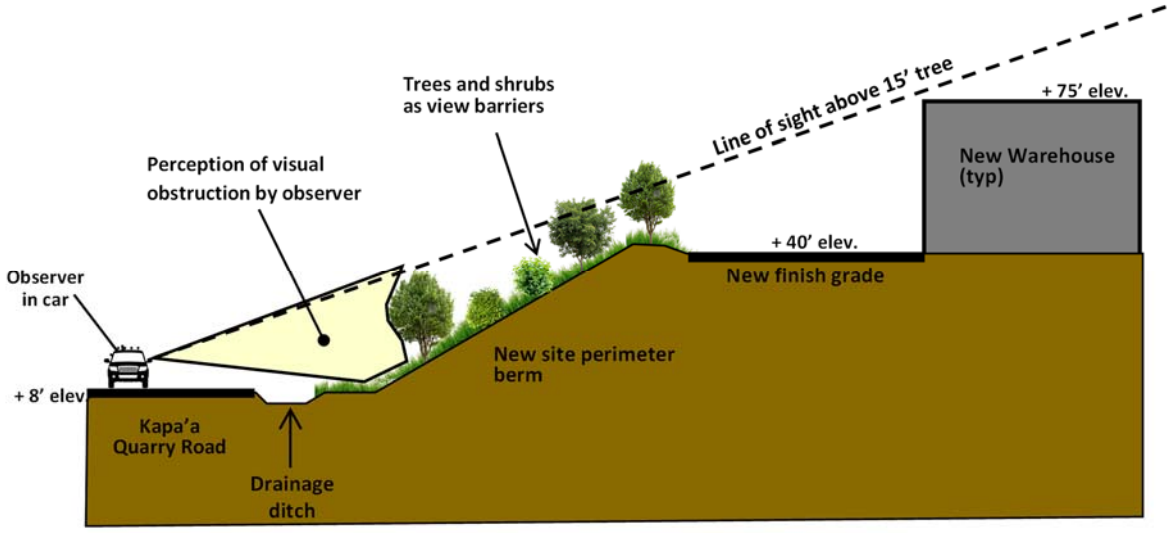

Figure 7.9: Cross-section D with trees on the new site perimeter berm (section drawn to scale)

Section E: Figures 7.10 and 7.11 show the cross-section E with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.10 indicates that without continuous vegetation screen, including trees and scrubs, on the new perimeter berm the closest new warehouses would be noticeable for about the upper half of their elevation.

Figure 7.11 shows that a continuous vegetation screen, including trees and scrubs, on the new perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 15-foot trees could shield views below the line of sight that intersects with the top of the warehouse structure.

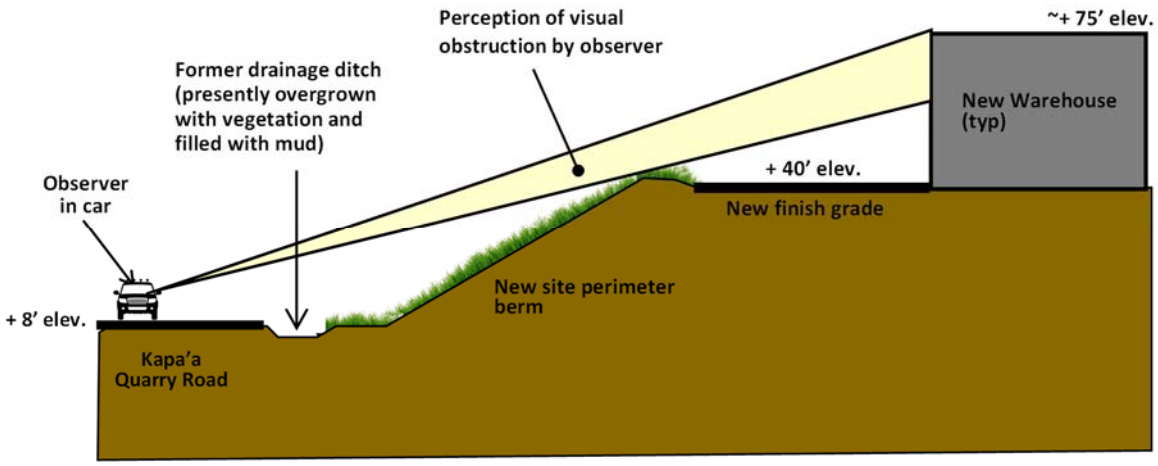

Figure 7.10: Cross-section E without trees on the new site perimeter berm (section drawn to scale)

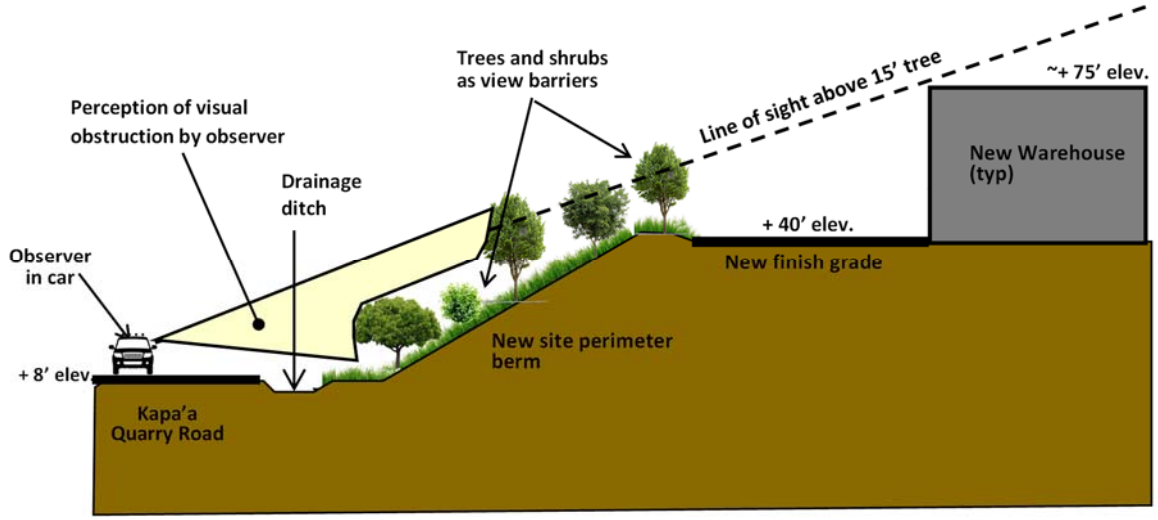

Figure 7.11: Cross-section E with trees on the new site perimeter berm (section drawn to scale)

Section F: Figures 7.12 and 7.13 show the cross-section F with and without trees and shrubs planted on the perimeter berm, respectively.

Figure 7.12 indicates that without a continuous vegetation screen, including trees and scrubs, on the new perimeter berm the closest new warehouses would be noticeable for about the upper two thirds of their elevation.

Figure 7.13 shows that a continuous vegetation screen, including trees and scrubs, on the new perimeter berm could block the line of sight on the warehouse structure in the cross-section view. The illustration suggests that 15-foot trees could shield views below the line of sight that intersects with the top of the warehouse structure.

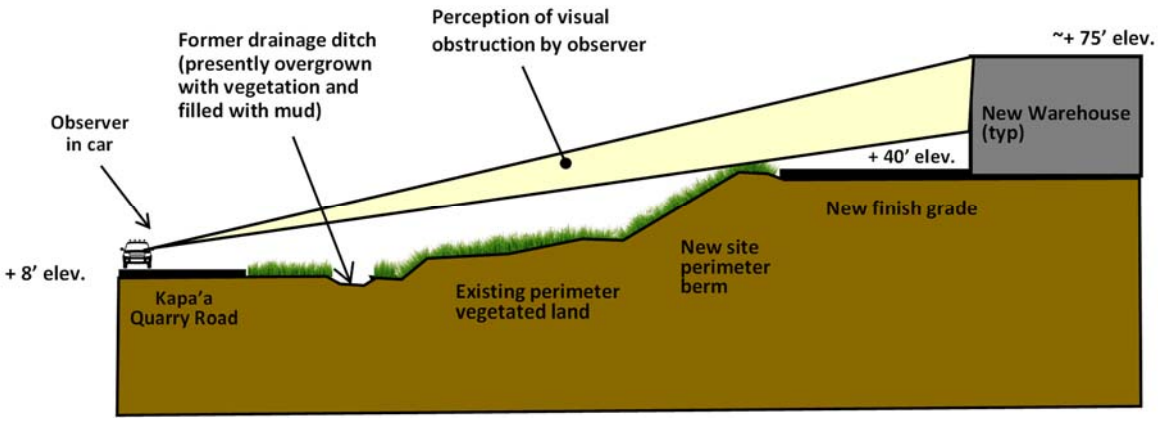

Figure 7.12: Cross-section F without trees on the new site perimeter berm (section drawn to scale)

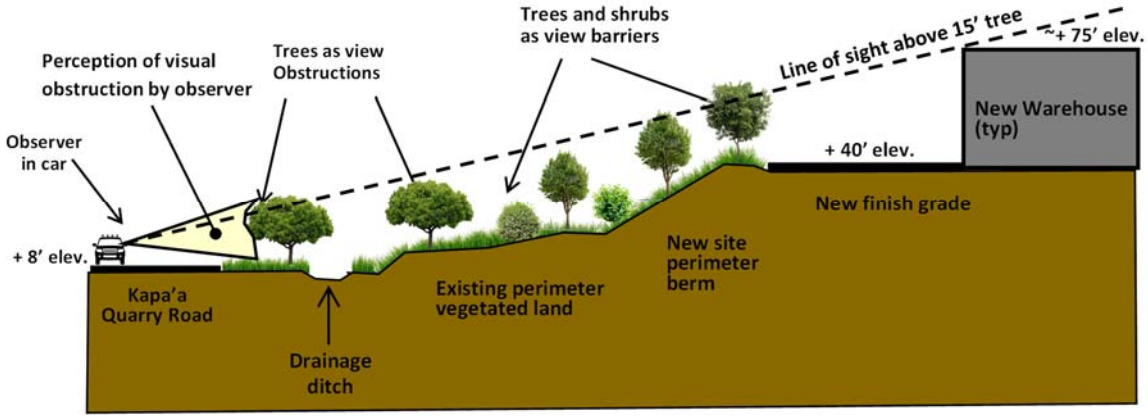

Figure 7.13: Cross-section F with trees on the new site perimeter berm (section drawn to scale)

SECTION 8: REDUCING VISUAL IMPACT FROM DISTANT VISTAS

Section 6 emphasized that an effective measure to reduce the visual impact of a building is through the application of color. The discussion in Section 6 suggested that the single-color approach would be most effective to lower the visual impact for views closer than ¼ mile and farther away than 1 mile. Consequently, for the view from locations across the Kawainui Marsh, single color applications should be the preferable approach to lower the visual impact of the new buildings in the Lower site.

The effectiveness of using color to hide buildings across the Kawainui Marsh is illustrated by looking at the impression of the existing Kapa'a Transfer Station. Figure 8.1 shows the existing appearance of the transfer station building façade and roof, with roof and façade clearly visible. In comparison, Figure 8.2 shows a simulated color scheme for the building façade and roof color, with colors selected from the surrounding land. The comparison of Figures 8.1 and 8.2 shows the effectiveness of using color to reduce visual impact for distant views by blending the building within the landscape.

Figure 8.1: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **A = Existing colors** for the building façade and roof

Figure 8.2: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **B = Simulated colors** for the building façade and roof; single color schemes for façade and roof were chosen to blend into the background (R,G,B values were taken from the vegetated background)

Figures 8.3 and 8.4 shows examples of possible single-color schemes that could be applied to the building facades and roofs at the project site. Figure 8.3 shows the front view from the East on the planned warehouse buildings. Figure 8.4 shows the side view from the South on of the planned warehouse buildings.

The final color scheme will be selected in the detail design phase, based on a color matching process. While visual impact mitigation might suggest walls and roofs that have a darker appearance, energy consumption could increase with colors that have high solar gain performance.

An optimum selection of color will be done by considering all aspects of the design.

Figure 8.3: Possible color schemes of future warehouses, front view from the East

Figure 8.4: Possible color schemes of future warehouses, side view from the South

SECTION 9: REDUCING VISUAL IMPACT WITHIN THE SITE

Visual impact reduction can also be achieved by planting trees inside the site, adjacent to the buildings. Trees are required to satisfy the county off-street parking lot shading ordinance. Figure 9.1 and 9.2 illustrate possible visual impressions of placing trees in front of building facades. The Figures 9.1 and 9.2 use the same color schemes as in Figures 8.3 and 8.4, but have trees superimposed in front of it.

Figure 9.1: Visual impressions of planting trees in front of future warehouses, front view from the East

Figure 9.2: Visual impressions of planting trees in front of future warehouses, front view from the South

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Appendix H:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

LIGHT POLLUTION MITIGATION
(NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop the Proposed

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix H

Proposed Concept Plan for Exterior Lighting

Updated report based on an exterior lighting concept plan that was accepted in 2016 by the Hawaii Department of Land and Natural Resources (DLNR)

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

ABOUT THIS REPORT

The conditional zone change (City and County of Honolulu Ordinance 13-35) for the land parcels TMK (1)4-2-15:006 (old TMK designation) itemizes the submittal and acceptance of the exterior lighting development concept in the rezoned parcel 4-2-15:006 as one condition of the Unilateral Agreement (Note the TMK designation of the land studied was changed to 4-2-15:014).

This technical report is an updated version of a January 2016 report that delineated the proposed concept for exterior lighting in the rezoned portion in TMK 4-2-15:006 (old TMK designation). The measures presented in this report provide the basic design elements of a comprehensive strategy of light pollution reduction.

In April 2016 DLNR accepted the January 2016 technical report, stating that the proposed light pollution reduction concepts and measures were acceptable. While the layout of the site in the lower portion has been changed under the recent updated site development plan, the basic premises and approaches remain the same. Therefore, it is assumed that the acceptance of the concepts and measures of mitigating light pollution at the site are still in effect.

Sustainable Design & Consulting LLC acts as the Consultant to the developer of the land, Kapa'a I, LLC and has developed the initial January 2016 technical report and the updated March 2021 version.

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

Manfred Zapka

MANFRED J. ZAPKA
LICENSED PROFESSIONAL ENGINEER
No. 13213-C
HAWAII U.S.A.

Expiration Date: 04/30/22

ACRONYMS

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
CRI	Color Rendering Index
HID	High-intensity Discharge (lamp)
HPS	High-Pressure Sodium (lamp)
IDA	International Dark-Sky Association
IECC	International Energy Conservation Code
IESNA	Illuminating Engineering Society of North America
LED	Light-emitting Diode (lamp)
LEED	Leadership in Energy and Environmental Design
LPD	Light power density
LPS	Low-Pressure Sodium (lamp)
LZ	Lighting Zone

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EXECUTIVE SUMMARY

In 2016, the authors of this report submitted, on behalf of the owners of the Kapa'a Light Industrial Park (KLIP), the report *"Kapa'a Light Industrial Park Development within TMK 4-2-15:006, Proposed Concept Plan for Exterior lighting in Lower Part of the Light Industrial Park".* The 2016 report delineated the preferred design concepts of reducing negative impacts from light pollution for the development within the Lower portion of the project site. The Department of Land and natural Resources (DLNR) accepted the proposed light pollution concepts by letter on April 5, 2016 (shown below).

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

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AQUATIC RESOURCES
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COMMISSION ON WATER RESOURCE MANAGEMENT
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

April 5, 2016

Manfred Zapka, PhD, PE, Principal
Sustainable Design & Consulting LLC
P.O. Box 25914
Honolulu, Hawaii 96825-0914

Dear Mr. Zapka:

The Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) has received your January 11, 2016 report *Kapa'a Light Industrial Park Development within TMK 4-2-15:006, Proposed Concept Plan For Exterior Lighting In Lower Part Of The Light Industrial Park* via your April 1 email request to Mr. Jim Cogswell, DOFAW Wildlife Manager.

The report describes the proposed external lighting concept for the project site. As described in the report, the zone change of land parcels TMK 4-2-15:012 and 006 (City & County of Honolulu, Ordinance 13-35) sets the acceptance by DLNR of a proposal for exterior lighting concept as one of the conditions of the associated Unilateral Agreement.

After review of the Plan submitted, DOFAW accepts the lighting concept proposed. Once the lighting is installed, if any native or unknown bird species or bats are found dead or injured on the property the incident should be reported to DOFAW's O'ahu branch at (808) 973-9778.

If you have any questions concerning this letter, please contact Jim Cogswell, Wildlife Manager, at 808-587-4187 or james.m.cogswell@hawaii.gov.

Sincerely,

David G. Smith
Administrator

Since the acceptance by DLNR, the development layout of the Lower site has been changed. These changes, however, did not affect the proposed design concepts of light pollution prevention. This

updated report on light pollution prevention addresses changes in the site development approaches of the lower portion of the project site.

Throughout this report, the TMK designations used in the 2016-report have been updated. In 2019, a change of the TMK designation for the entire project site of the Kapa'a Light Industrial Park (KLIP) was performed by the City and County of Honolulu. The updated TMK designation replaces the old 4-2-15:008 with the new 4-2-15:013. Likewise, the old TMKs 4-2-15:006 and 012 have been consolidated into the new 4-2-15:014. The old TMK 4-2-15:006 is now the lower portion of the new TMK 4-2-15:014.

Changes in the site development plans include changes in the number of buildings and building layout. The former site layout included a 3.7-acre base yard. Under the new proposed site layout, the base yard has been replaced with warehouse structures.

From the perspective of light pollution prevention, these changes should be regarded as beneficial. It is assumed that light emittance from warehouses should be less than from the base yard operations. Typically, base yard operations at night require illumination with light sources which are relatively bright and have good color rendering. Therefore, the changes of the site development plan will be beneficial, causing reduced light pollution impacts from the initial January 2016 version of this report.

The zone change of land parcels TMK 4-2-15:01 and 006 (City & County of Honolulu, Ordinance 13-35) states that the submittal for acceptance by DPP / DLNR of a proposal for exterior lighting concept is one of the conditions of the Unilateral Agreement. This report delineates the proposed external lighting concept for the project site (rezoned portion of old parcel TMK 4-2-15:006, and new TMK 4-2-15:014).

Existing Site Conditions

The existing site conditions are presented. The project site is a former landfill area which was closed some four decades ago. The site is graded and has a gravel surface. The site is surrounded al all sides with vegetated areas of different widths and density. These vegetated areas are not managed at the present and their plant populations were naturally introduced.

The report describes the existing site perimeter which will be upgraded and improved at full build-out. Earth berms will be increased in height and width. Existing non-native invasive species will be removed, and native or adaptive plants will be planted. The purpose of the upgraded and restored site perimeter is mitigation of several impacts, such as visual, noise, dust, and storm water runoff.

In support of light pollution mitigation, the upgraded and improved site perimeter will curb light trespassing to the adjacent land. Some of this land consists of aquatic resources, including a wetland in the North and the Kawaii Nui marsh to the East of the site.

The report discusses negative impacts of excessive external lighting on wildlife, especially migrating seabirds, and proposes mitigation measures to reduce light pollution in the vicinity of the project site. The report also indicates that the proposed measures to mitigate impacts from excessive external lighting also improve the night sky experience and save energy for lighting.

The recommendations for the external lighting concept of the project site include the following main strategies:

- Location: Light only where the light is needed for the function, e.g., provide the minimum required illumination for safety and security at the required location. Avoid lighting areas where light is not needed.
- Timing: Light only when artificial light is needed, e.g., avoid lighting during night hours unless light is needed for safety and effective work and movement within the project site.
- Shielding: Shield lights and avoid unnecessary light trespassing, e.g., use only fixtures that provide effecting shielding.
- Lamp Color: Select lamps with the appropriate color, e.g., select the color of lamps that provide the appropriate color rendering and pose the lowest impacts on wildlife.
- Light power density: Use the minimum amount of light necessary, e.g., follow the guidelines and codes to limit the light power density by using the most energy efficient lamps.
- Efficiency: Select the most ENERGY EFFICIENT lamp and fixture: Create lighting choices that are consistent with energy efficiency codes.

Based upon these strategies, the recommended external lighting approach for the project site is as follows:

- The adjacent land is categorized in accordance with light zones as LZ2 and LZ3 for the vegetated land and the highly developed land adjacent to the project site, respectively.
- The amount of light trespassing into the adjacent land follows the recommendation of the LEED credit for light pollution reduction.
- The light power densities for external lighting follow the energy code and the ASHARE 90.1 standards.
- Low-pressure sodium lamps are selected for the roadways and parking lot luminance since their monochromatic spectrum is reported as causing the least negative impacts on wildlife. The unfavorable color rendering of low-pressure sodium lamps is considered acceptable for the intended function and their environmental benefits determined the selection.
- LED external fixtures are limited to areas where color rendering is of concern, such as for loading docks and for building entrances.

The design conclusions and recommendations in this report result in an environmentally friendly and energy efficient external lighting concept for the project site. The design concept presented in this report provides the binding framework for the detail design of the external lighting and the final product selection.

SECTION 1 - OBJECTIVES

The objective of this technical report is to submit to (DLNR), Division of Forestry and Wildlife, a proposed exterior lighting concept that will mitigate detrimental impacts on wildlife from exterior lighting.

The Unilateral Agreement of Ordinance 13-35 for the Rezoned Land Portions within the Lower site of TMK 4-2-15:014 (old TMK 4-2-15:006) states conditions for external lighting as follows:

> *4. Exterior Lighting. To mitigate lighting impacts on migrating seabirds, all exterior lighting shall be fully shielded such that light emitted from the fixture is projected below the horizontal plane of the lowest point of the fixture. Prior to the issuance of building permits for the purpose of site development, the Declarant shall submit a conceptual plan for light management to the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife for review and approval, unless the DLNR grants an exemption, in whole or part, from the requirement; and the Declarant shall thereafter provide the DPP with documentation of approval or exemption. The Plan shall address the proposed location and design scheme of exterior light fixtures as well as light bulb brightness, bulb type, and light color.*

While exterior lighting is required to secure a level of safety and security during nighttime, there are several undesirable impacts from excessive or obtrusive lighting, such as:

(A) **Lighting impacts on wildlife:** All animals, including humans, depend on a regular interval of daylight and darkness for proper functioning of behavioral, reproductive and immune systems. Many of these animals need the natural night to survive. Migratory seabirds, in particular, are affected by light pollution. Bright lights distract and often disorient the birds, drawing them off course and sometimes leading them to fly into the sides of buildings. (IDA, 2014)

(B) **Glare impact on traffic:** Excessive light can create unsafe situations when drivers are impacted by glare from nearby lights.

(C) **Lighting impacts in the night sky experience:** Excessive and ill-designed lighting can cause glare, sky glow and light trespassing that obscures the night sky.

(D) **Energy impacts of excessive lighting:** Much energy can go to waste from lighting that is redundant or not well used.

In order to avoid negative impacts from excessive or obtrusive lighting the following basic design objectives will be used:

- Light only WHERE you need it: Integrate lighting to the function of the activities in the industrial park and the location of lighting.
- Light only WHEN you need it: Control lighting to periods that are absolutely needed for safe and effective work.
- SHIELD lights and direct them downward: Avoid lighting to create upward illumination.
- Select LAMPS WITH APPROPRIATE COLORS: Light colors (or temperatures) have a varying effect on the environment. The right choice of the exterior lighting is an important design consideration.
- Use the MINIMUM AMOUNT of light necessary: Avoid implementing more illuminance than required for the function and location.
- Select the most ENERGY EFFICIENT lamp and fixture: Create lighting choices that are consistent with energy efficiency codes

SECTION 2 - DESCRIPTION OF THE EXISTING PROJECT SITE

Figure 2.1 shows the site location. The project site is located on the windward side of Oahu. The project site is located in the lower stretches of the of Kapa'a Valley. The site's distance to the western border and center the Kawai Nui Marsh is 0.1 and 0.6 miles, respectively.

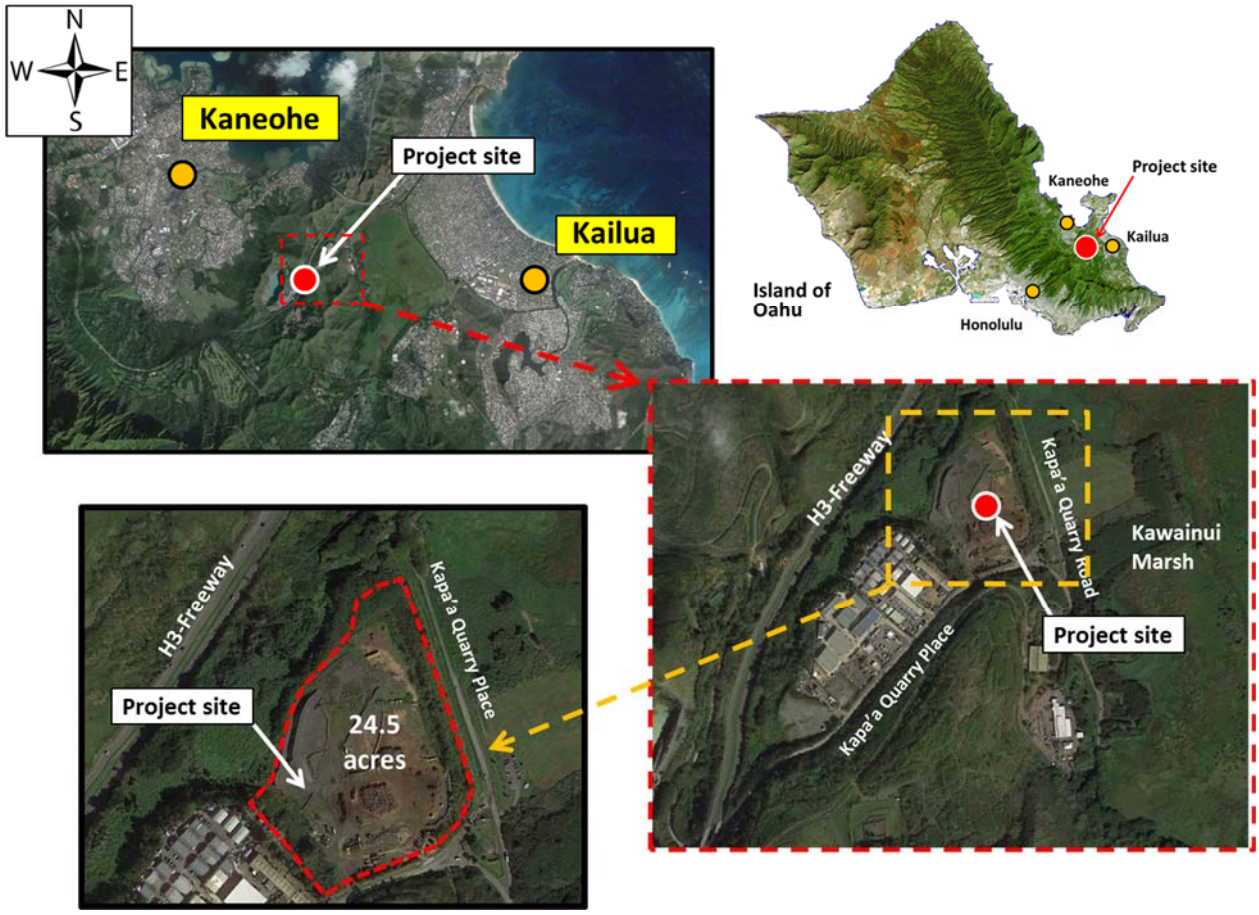


Figure 2.1: Site location

Figure 2.2 indicates that the project site is located inside the "Urban" State Land Use District.

Figure 2.3 shows the legal boundaries and the County land use zoning of the project and adjacent land. The project site was rezoned from P-2 to I-1. The project site is surrounded by land parcels with different land use designations.

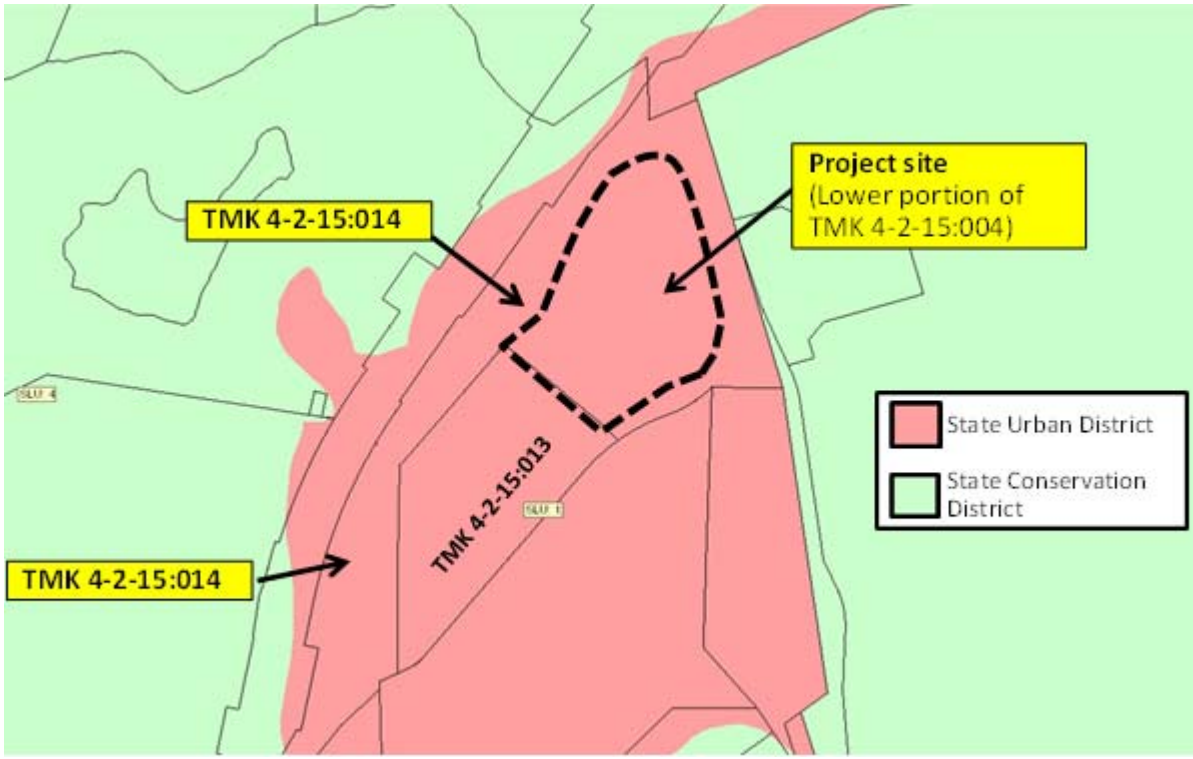


Figure 2.2: Project site is located within the "Urban" STATE LAND USE DISTRICT

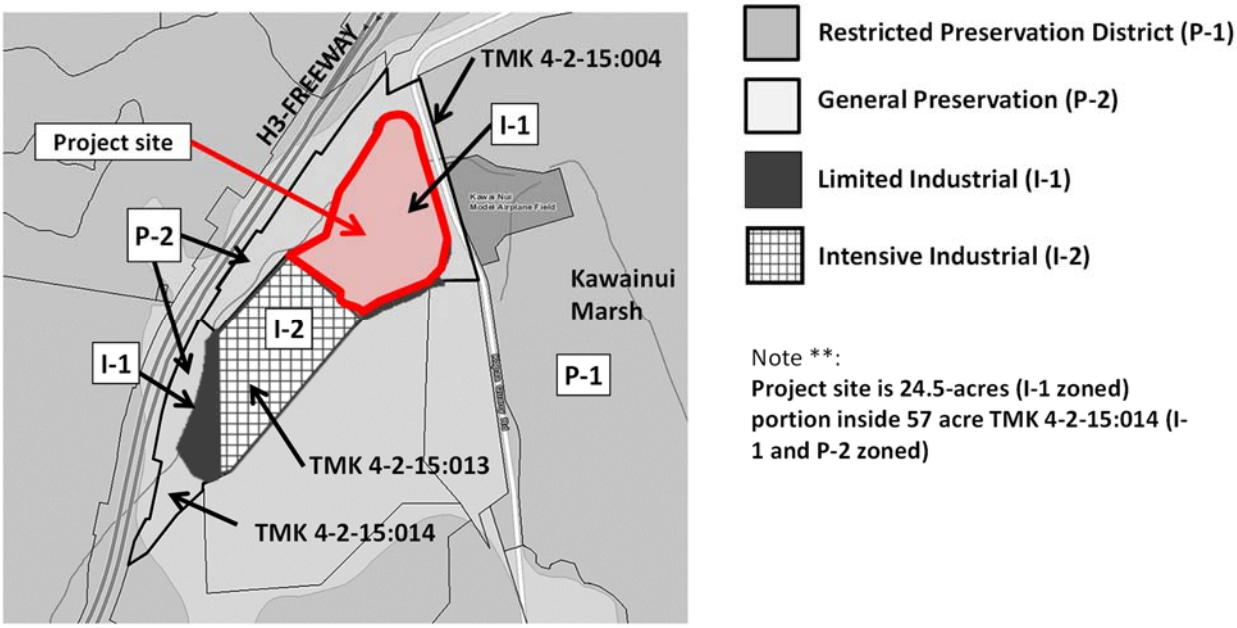


Figure 2.3: Legal boundaries (County) of the project site and adjacent land

Figure 2.4 shows the specific zoning of parcel TMK 4-2-15:014. Figure 2.4 indicates that the project site occupies the Lower portion of land parcel 4-2-15:014. The 24.5-acre project site is zoned as Limited Industrial (I-1) whereas the remaining 20 acres of the parcel were not rezoned and are within the General Preservation (P-2) zoning district.

Figure 2.5 shows that the project site is within the Special Management Area (SMA). Land within the SMA Status 1 area requires effective impact mitigation.

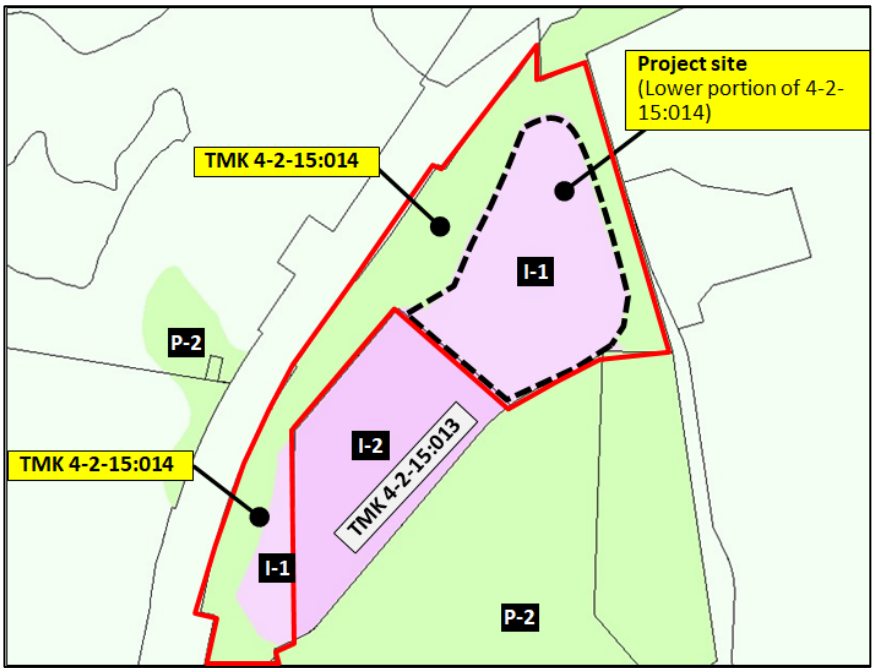


Figure 2.4: Project site is located within County Limited Industrial Zone

Figure 2.5 illustrates the location of the project site relative to environmentally sensitive land, including the Kapa'a Stream corridor to the North-West and the Kawaii Nui Marsh to the East of the project site. The figure depicts the present conditions at the site.

The project site is located on a former landfill, which was created from domestic waste and quarry tailing and overburden. No part of the project site occupies vegetated land in the Kapa'a Stream corridor. The Kapa'a Stream is a 303-listed inland water body. The Kapa'a Stream is the main drainage for the 900-acre Kapa'a Valley. The Kapa'a Stream streambed was offset several hundred feet to the North when the landfill was formed. The existing streambed is situated between the H3-Freeway and the landfill.

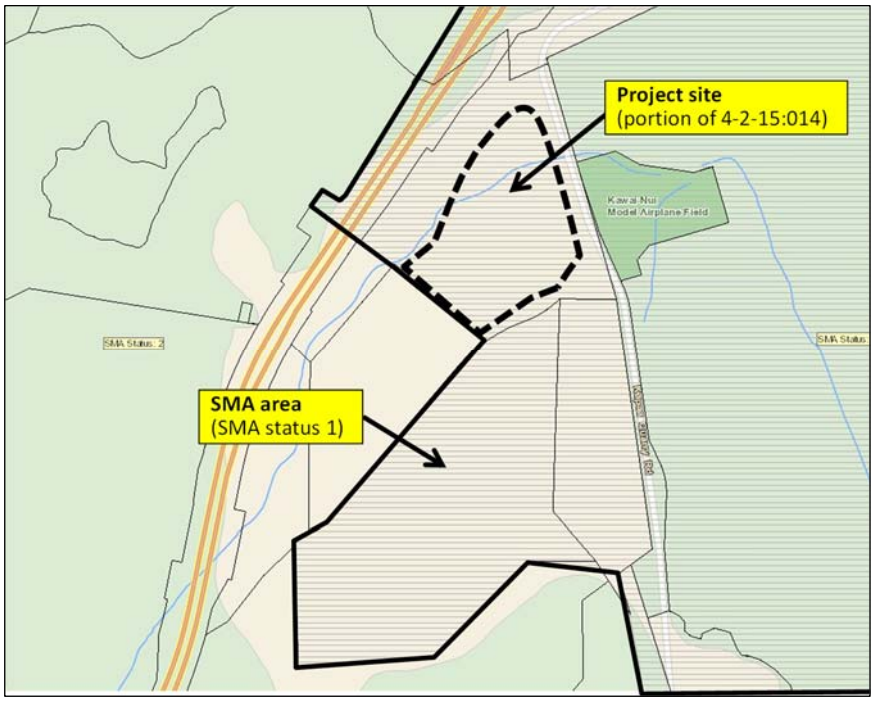


Figure 2.5: Project site is located within Special Management Area (SMA status 1)

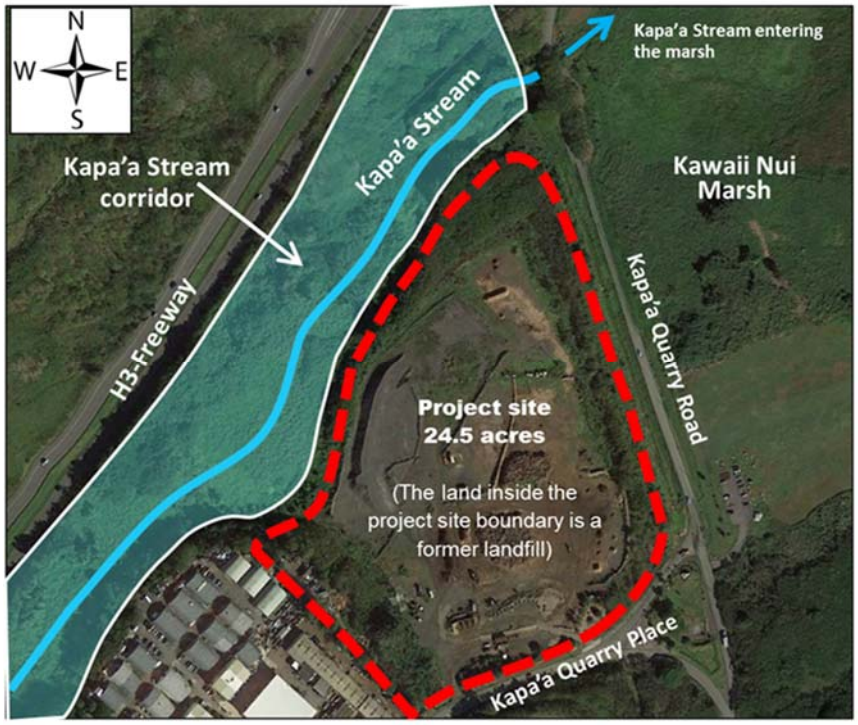


Figure 2.5: Project site and adjacent land use

The project site is located on land that was formed by a former landfill. The project site will not occupy any environmentally sensitive land, especially land inside Kapa'a Stream corridor. The Kapa'a Stream corridor is located between the H3-Freeway and the landfill area.

SECTION 3 - CONDITIONS AT FULL BUILD-OUT

Figure 3.1 shows the proposed full build-out project Lower site.

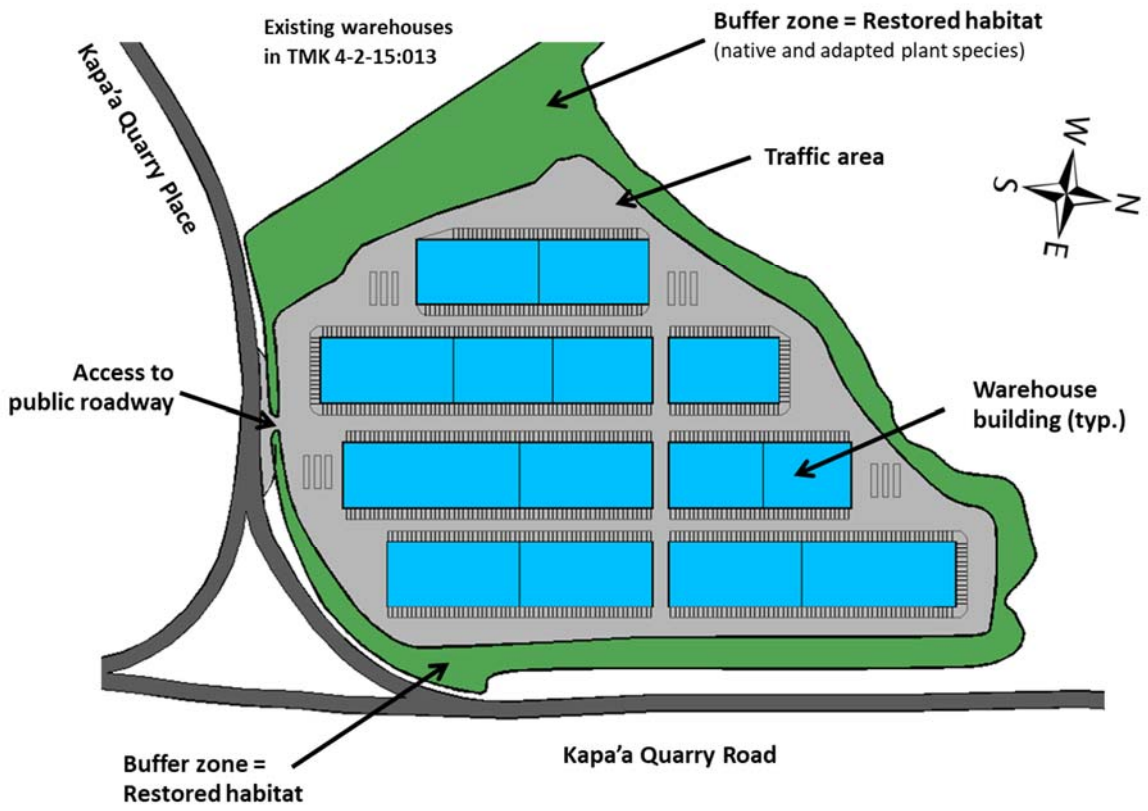


Figure 3.1: Project site and adjacent land use project site (updated image)

The project site is situated inside the Lower portion of the 57-acre parcel TMK 4-2-15:014. About 29 acres of the parcel TMK 4-2-15:014 will stay in their existing condition, densely vegetated land. Of the 25-acre project site in the lower site, 19 acres will be covered with impervious pavement and buildings. The remaining 6 acres will include landscaped area inside the vegetative buffer zones at the site perimeter.

The current plan of the light industrial development includes 14 warehouses, with building floor space ranging from 20,000 to 38,000 square feet. While the actual amount of light industrial warehouse space may vary, the development will only have warehouse buildings. Therefore, the type of external lighting will remain that of parking and traffic areas.

Figure 3.2 and 3.3 show the project site with a bird's eye view.

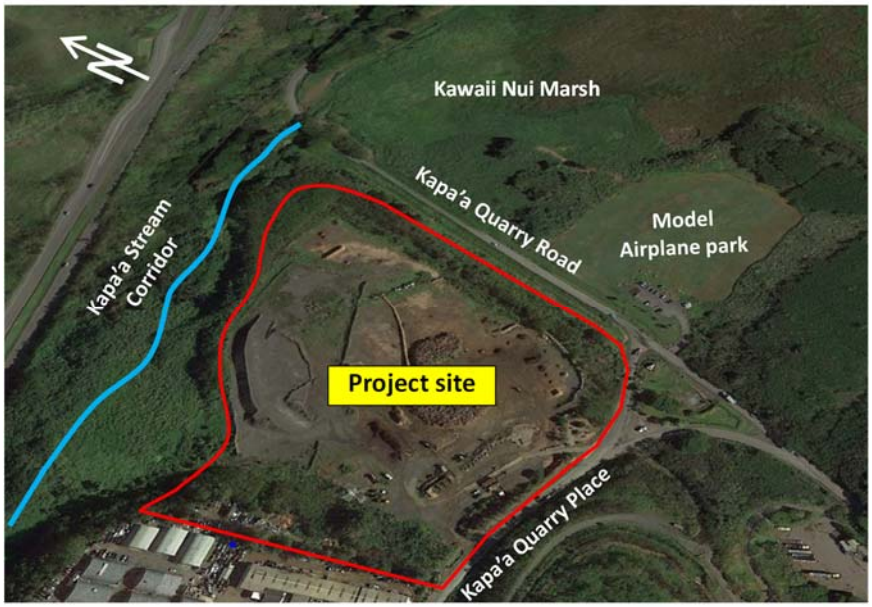


Figure 2.3: Project site and adjacent land use project site

Figure 2.3: Project site and adjacent land use project site

SECTION 4 - CONDITIONS OF THE EXISTING PROJECT SITE PERIMETER

This section describes the existing conditions of the site perimeter. The vegetated areas around the project site perform important impact mitigation functions, such as shielding land adjacent from visual and light impacts, providing some level of storm water treatment, and lowering noise and dust impact.

The existing site perimeter will be improved and expanded during site development, regarding geometry (e.g., height and width of earth berms) and type and density of vegetation.

The existing project site perimeter is made of several sections of vegetated areas with differing widths. Figure 4.1 shows five sections of the existing perimeter which have similar geometries and plant compositions. These five sections are described in the following.

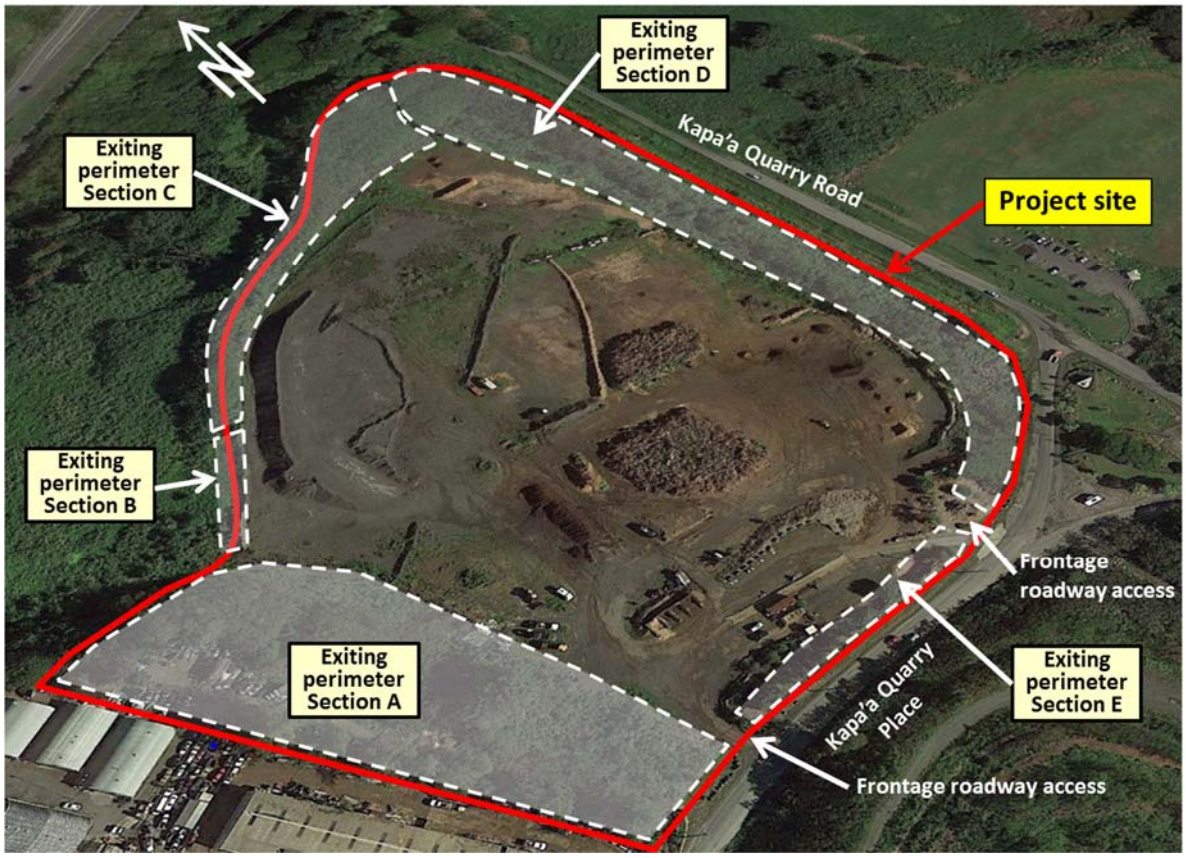


Figure 4.1: Location and extent of five sections of the existing site perimeter

Existing perimeter Section A:

Figure 4.2 shows the location of Section A of the existing site perimeter. Figure 4.3 describes Section A.

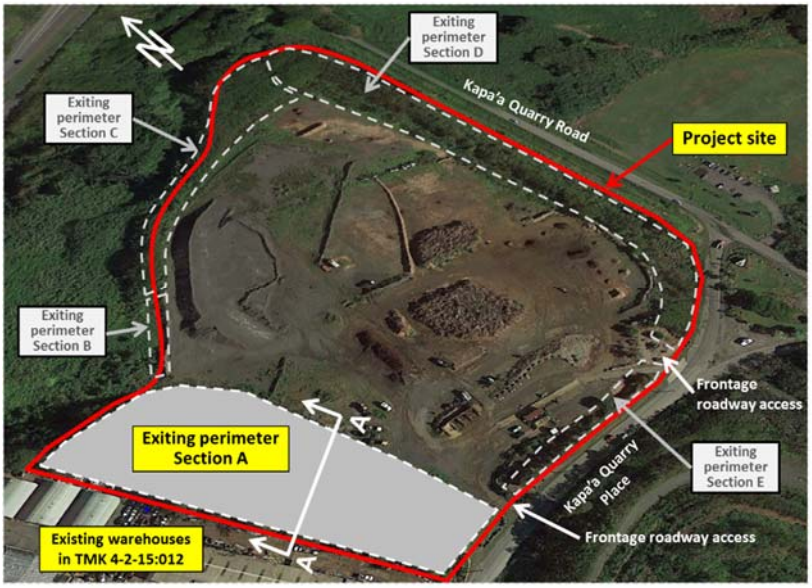


Figure 4.2: Location and extent of Section A of the existing site perimeter.

This section of the site perimeter separates the project site from the area in the South, which contains an existing warehouse development. The cross-section A-A is a typical section through this section of the site perimeter.

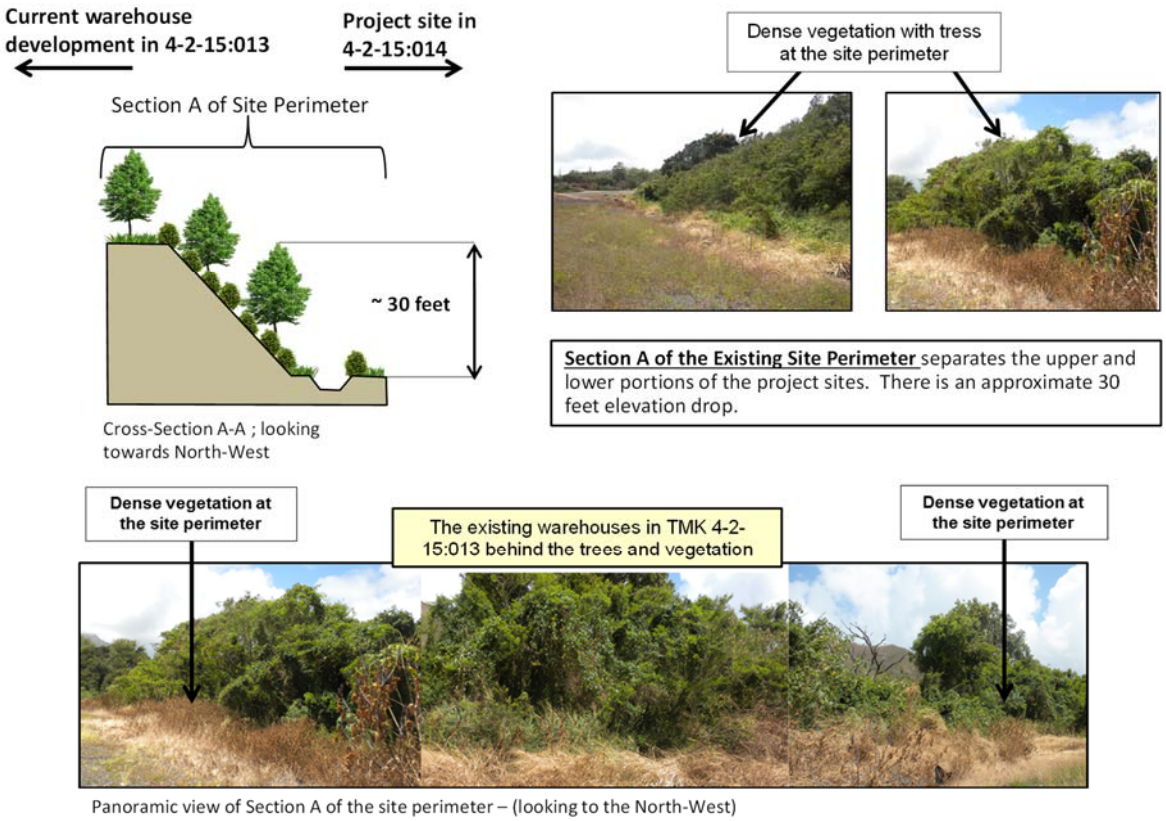


Figure 4.3: Description of Section A of the existing site perimeter

Existing perimeter Section B:

Figure 4.4 shows the location of Section B of the existing site perimeter. Figure 4.5 describes Section B.

Figure 4.4: Location and extent of Section B of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Stream corridor. This section of the site perimeter does not have an earth berm.
The cross-section B-B is a typical section through this section of the site perimeter.

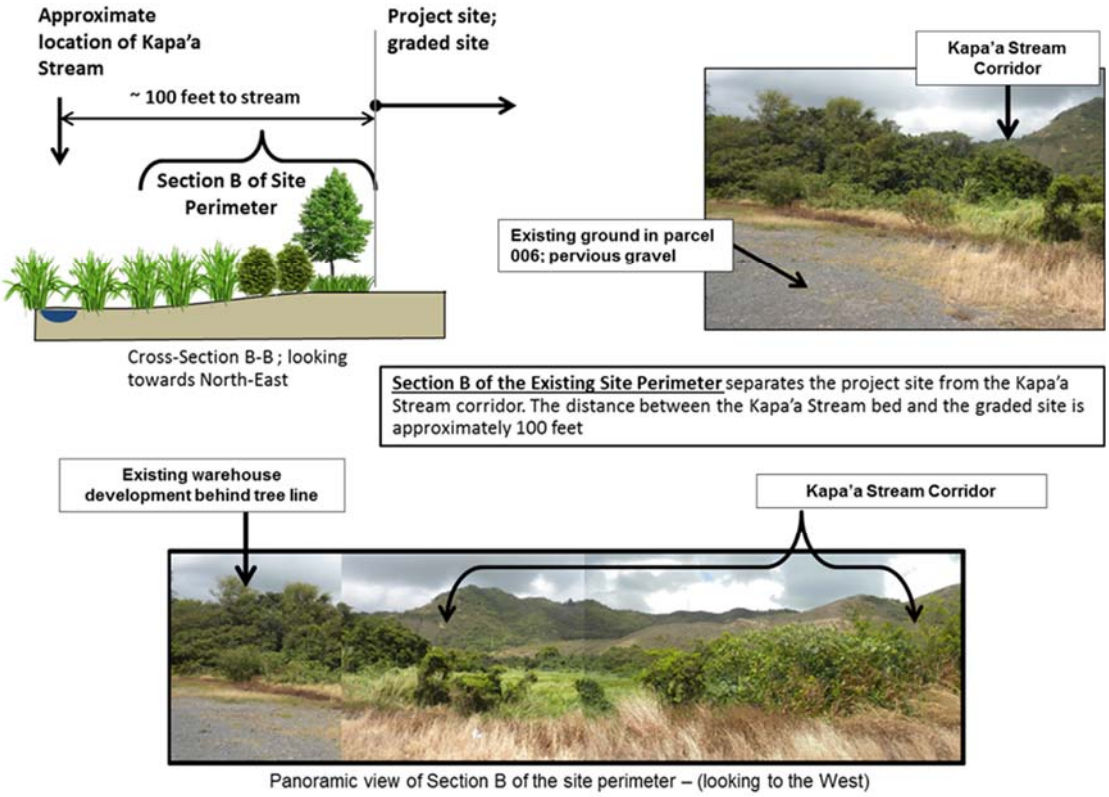


Figure 4.5: Description of Section B of the existing site perimeter

Existing perimeter Section C:

Figure 4.6 shows the location of Section C of the existing site perimeter. Figure 4.7 describes Section C.

Figure 4.6: Location and extent of Section C of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Stream corridor. This section of the site perimeter has earth berms that range from 3 to 5 feet in height. The cross-section C-C is a typical section through this section of the site perimeter.

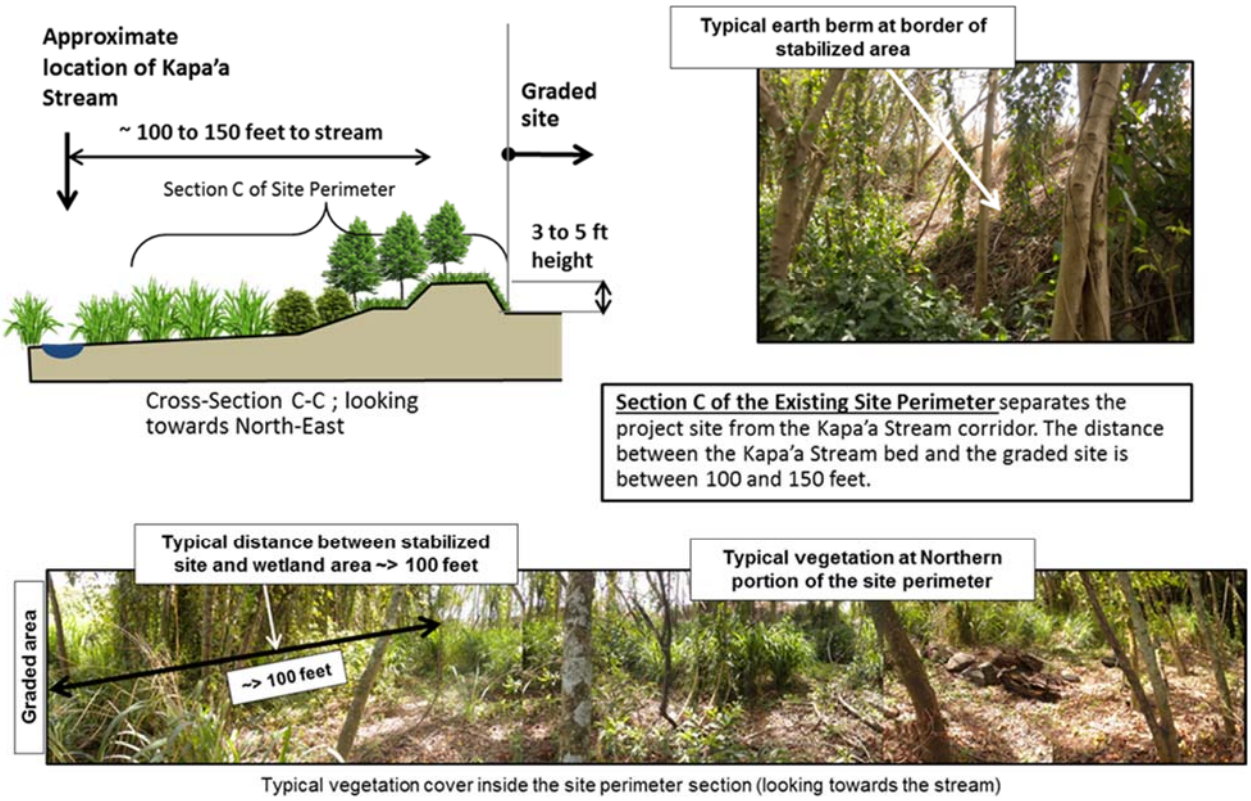


Figure 4.7: Description of Section C of the existing site perimeter

Existing perimeter Section D:

Figure 4.8 shows the location of Section D of the existing site perimeter. Figure 4.9 describes Section D.

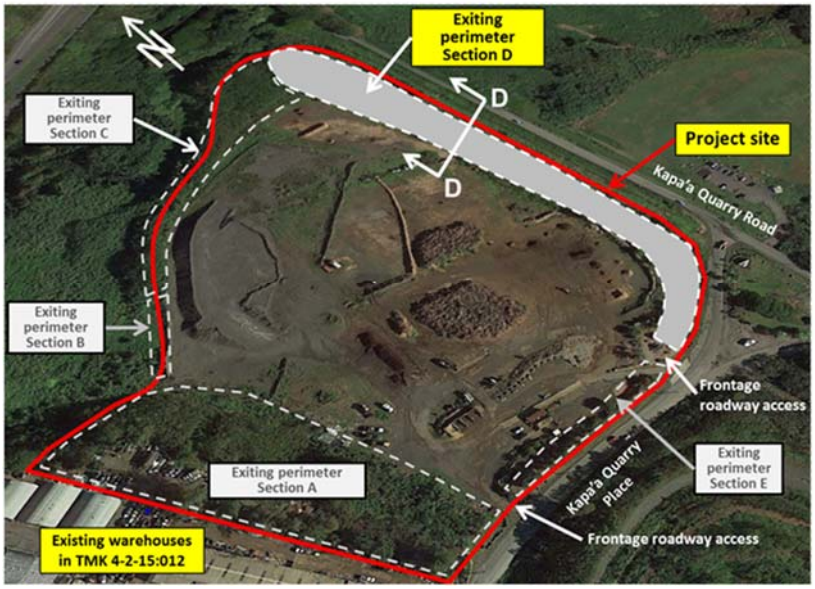


Figure 4.8: Location and extent of Section D of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Quarry Road and the Kawaii Nui marsh. This section of the site perimeter has earth berms that range from 5 to 7 feet in height.
The cross-section D-D is a typical section through this section of the site perimeter.

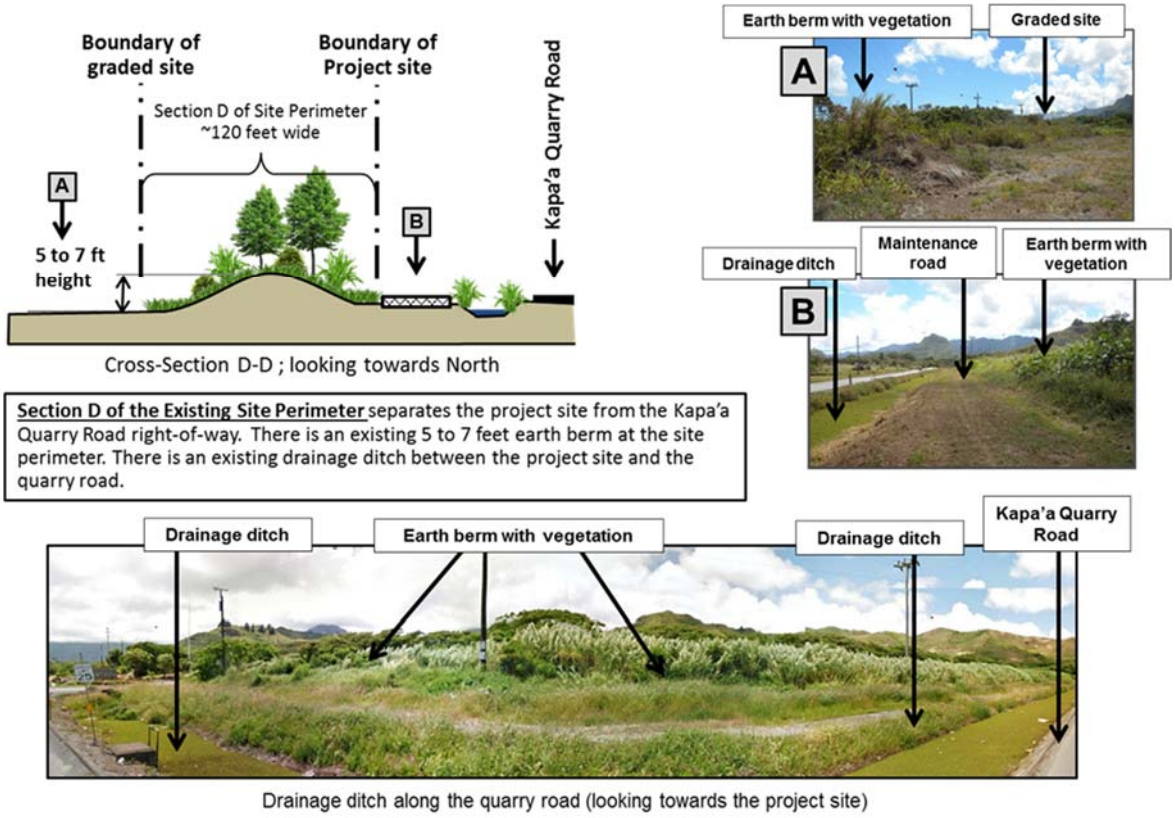


Figure 4.9: Description of Section D of the existing site perimeter

Existing perimeter Section E:

Figure 4.10 shows the location of Section E of the existing site perimeter. Figure 4.11 describes Section E.

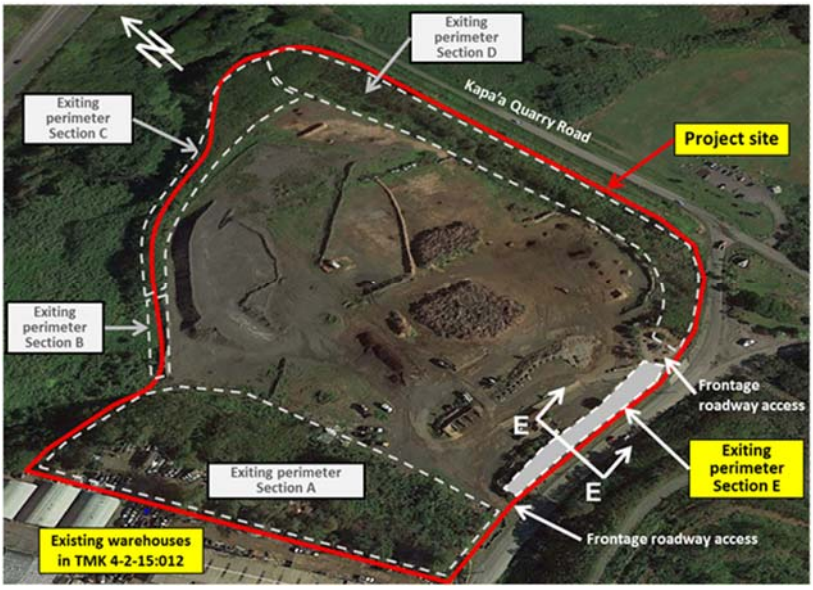
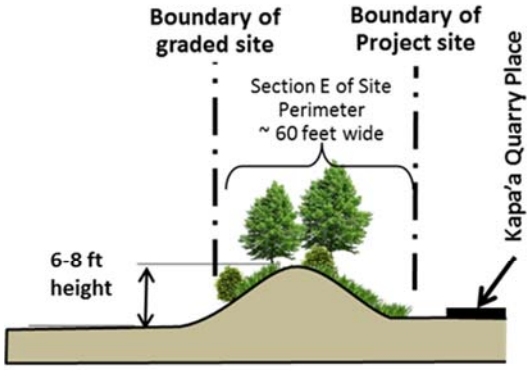


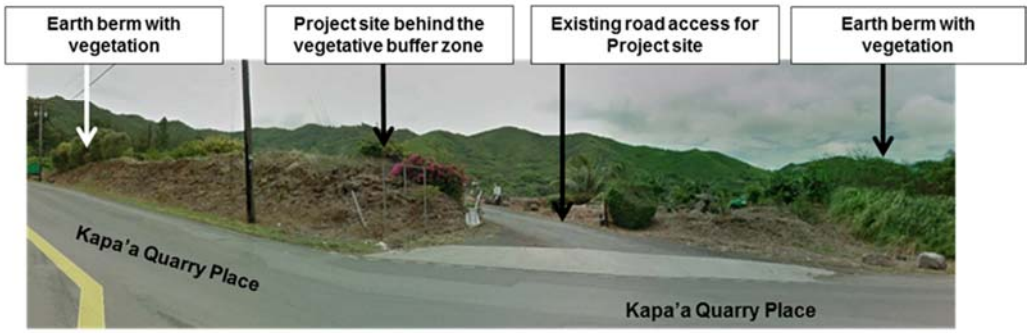
Figure 4.10: Location and extent of Section E of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Quarry Place roadway. This section of the site perimeter has earth berms that range from 6 to 8 feet in height.
The cross-section E-E is a typical section through this section of the site perimeter.



Cross-Section E-E ; looking towards East

Section E of the Existing Site Perimeter separates the project site from the Kapa'a Quarry Place right-of-way. There is an existing 6 to 8 feet high earth berm at the site perimeter.



Kapa'a Quarry Place at the Western frontage road access

Figure 4.11: Description of Section E of the existing site perimeter

SECTION 5 - NEW VEGETATIVE BUFFER ZONES AT FULL PROJECT BUILD-OUT SITE PERIMETER

Figure 5.1 shows land use of areas adjacent to the project site.

- The land to the **North** is the Kapa'a Stream corridor. The land has a dense vegetation, and a portion is wetland.
- Directly to the **East** of the project site is Kapa'a Quarry Road, which is a heavily travelled public roadway. Further to the East is the Kawai Nui Marsh, the state's largest contiguous wetland area and home of several federally listed water birds.
- Directly to the **South** is the Kapa'a Quarry Place, a public roadway with significantly less traffic than the Kapa'a Quarry road.
- The land to the **West** is the existing warehouse development in parcel TMK 4-2-5:013.

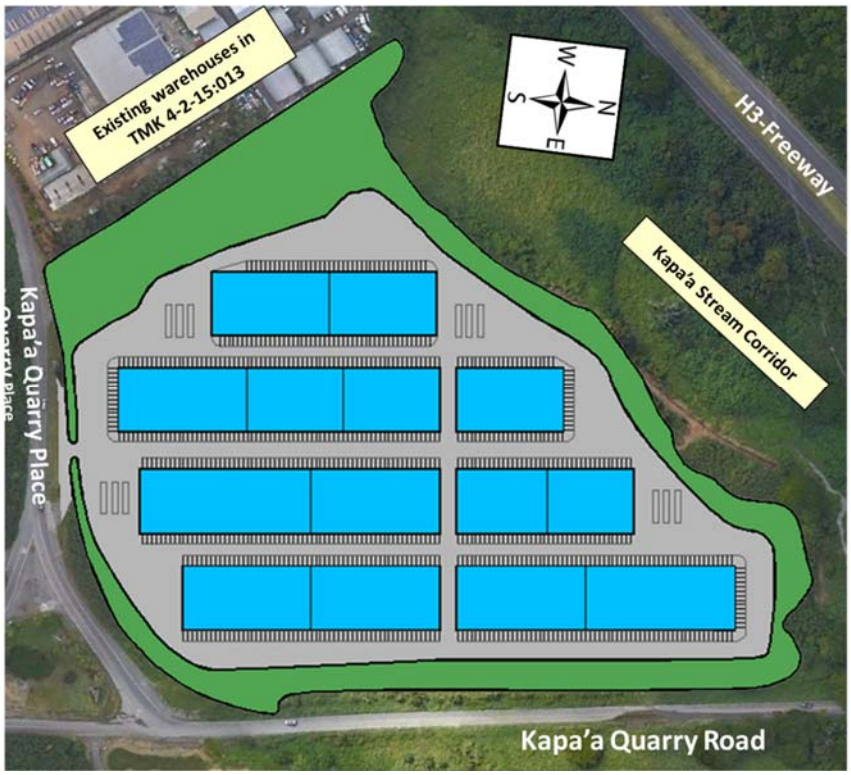


Figure 5.1: Project site at full build-out with land use of adjacent land

New vegetative buffer zones at site perimeter; areas are restored habitat with native and adapted plants.

New buildings inside the project site

Traffic and parking areas inside the project site

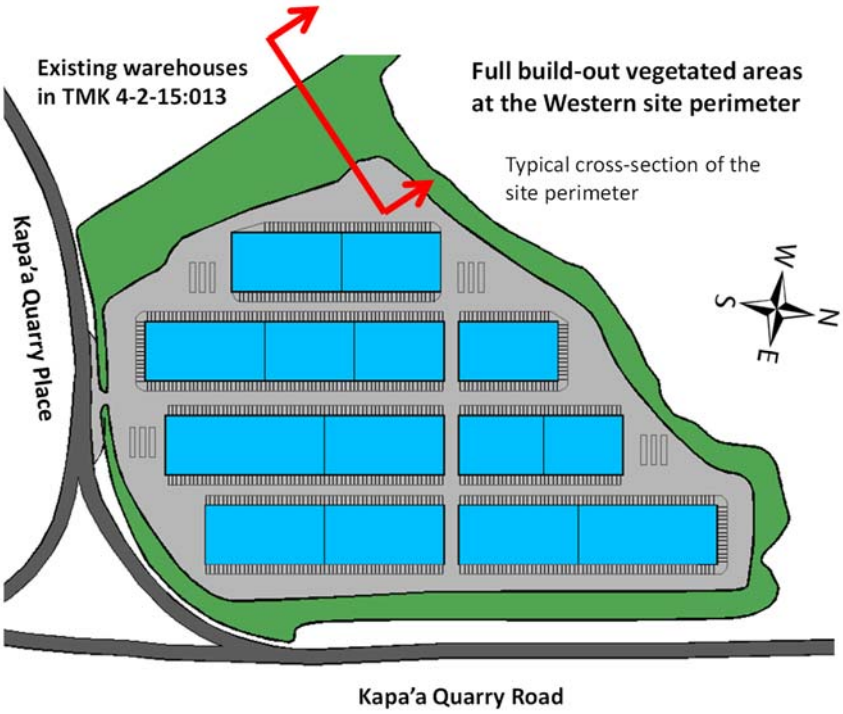
(Updated image)

The new vegetative buffer zones at the site perimeter will have important visual impact mitigation functions. In regard to visual impact mitigation the dense vegetation protects the surrounding land from direct illumination impact.

The following pages describe the configuration of the vegetative buffer zones around the full build-out project site. Figures 5.2 through 5.9 describe the locations and light pollution reduction approaches of four typical sections of the full build-out perimeter areas. Each typical section is described by means of a

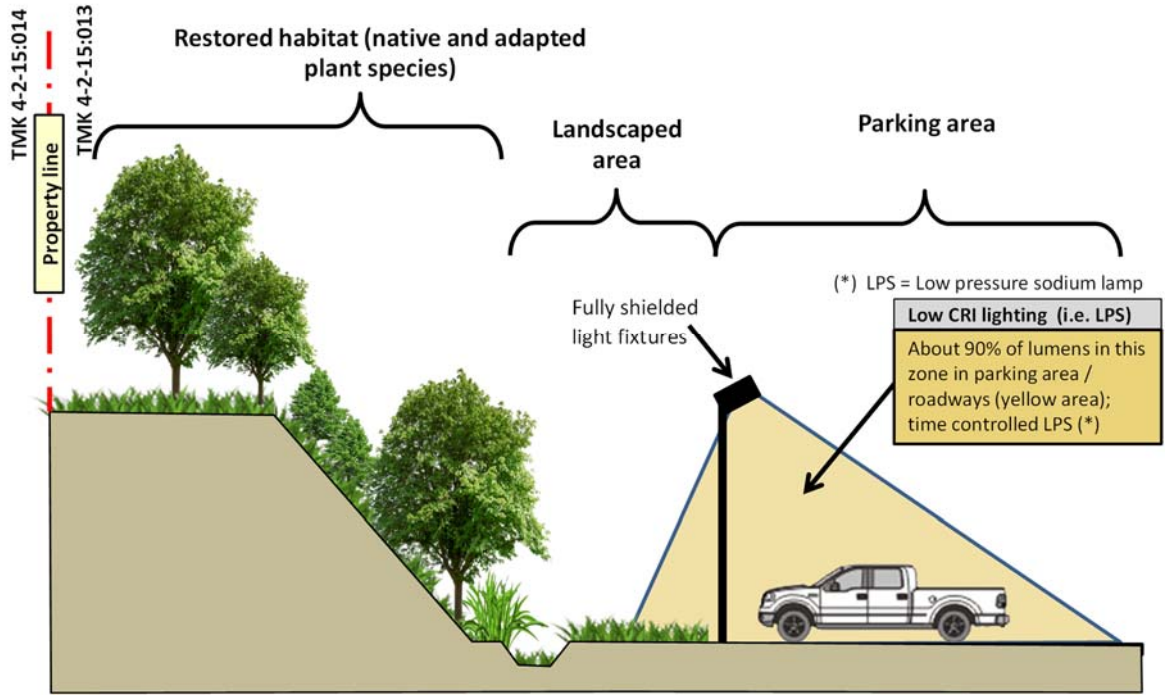
concept sketch indicating the extent of light trespassing from the traffic and parking areas to the surrounding vegetated land.

Full Build-out vegetated perimeter at the **Western** project site – typical section:



<<< Figure 5.2: Location and extent of full build-out vegetated area at the **Western** site perimeter

Below:
Figure 5.3: Concept of external lighting at the Western site perimeter at full build-out - Typical cross-section
Note: Concept illustration not to scale



Full Build-out vegetated perimeter at the **Northern** project site – typical section:

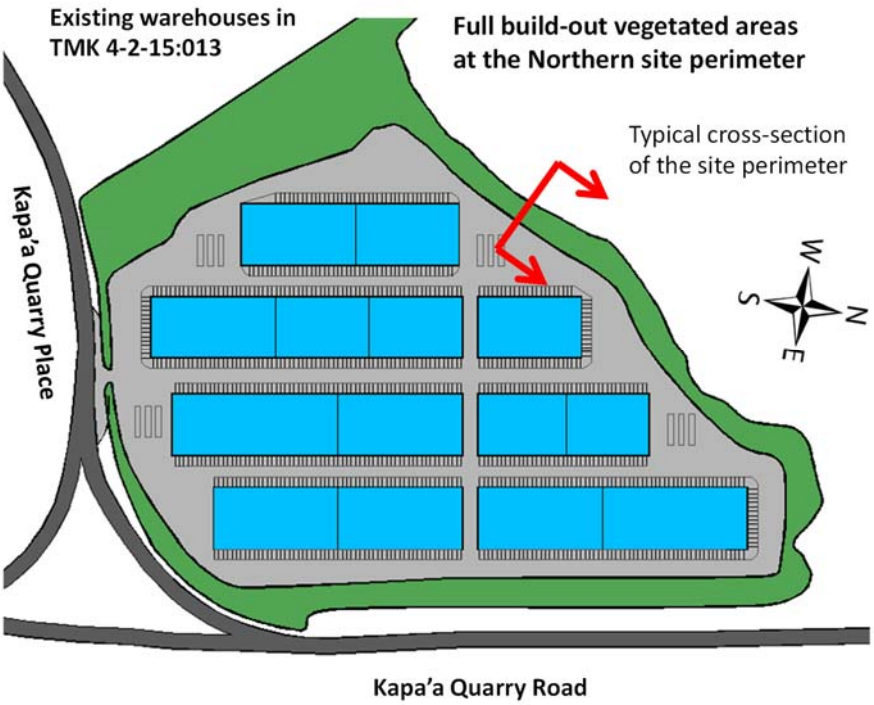


Figure 5.4: Location and extent of full build-out vegetated area at the **Northern** site perimeter

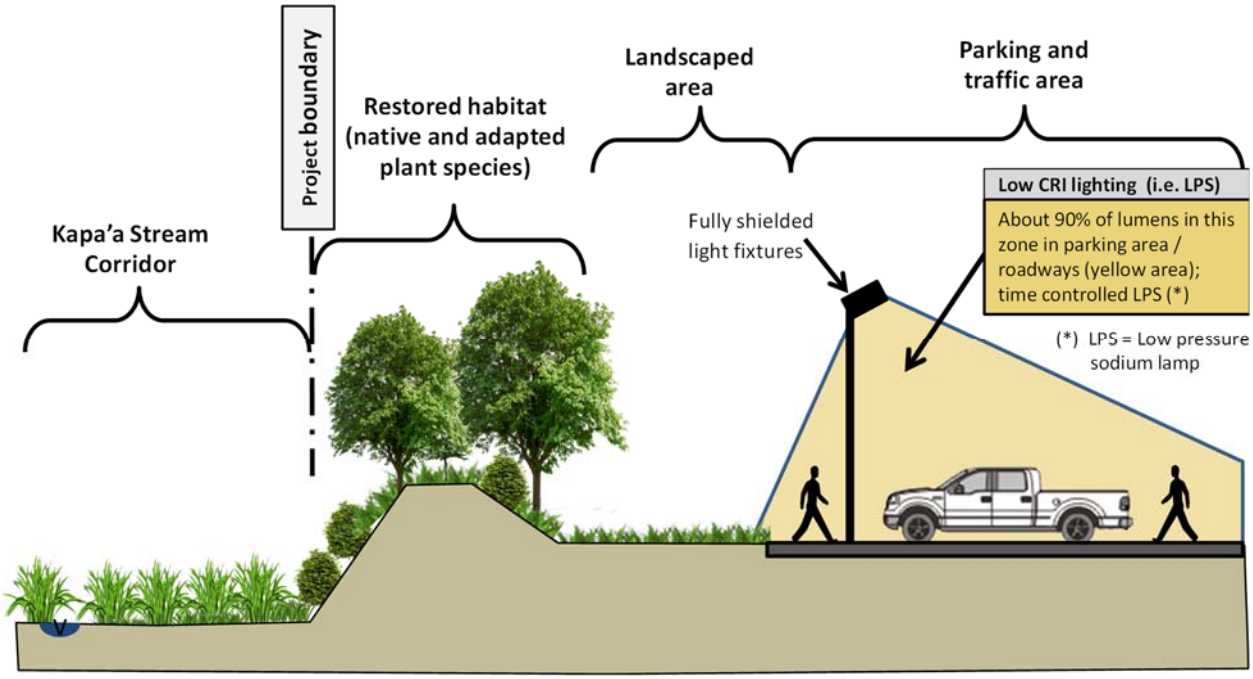


Figure 5.5: Concept of external lighting at the **Northern** site perimeter at full build-out - Typical cross-section – Note: Concept illustration not to scale

Full Build-out vegetated perimeter at the **Eastern** project site – typical section:

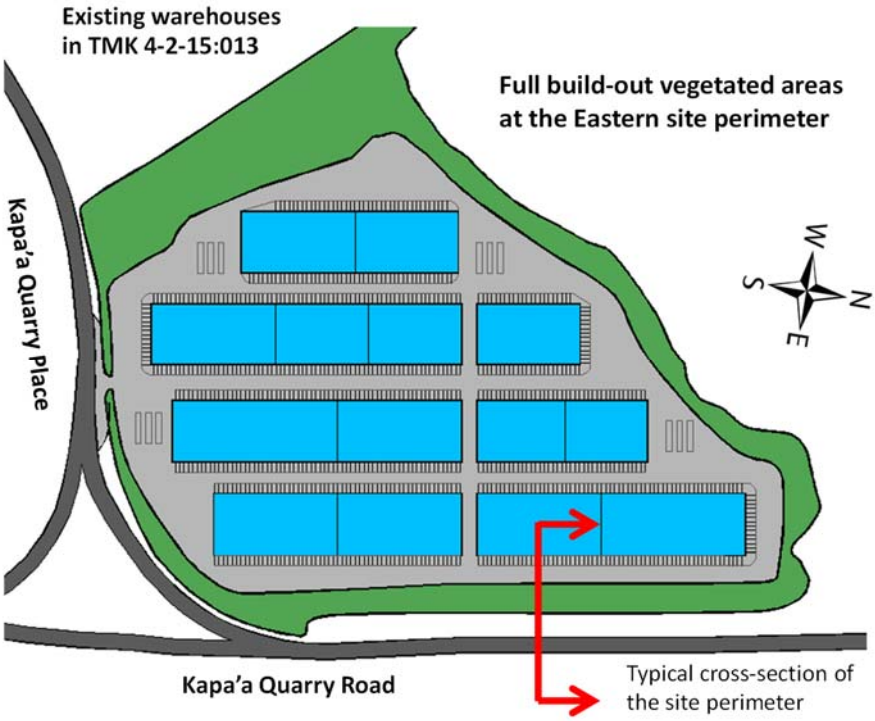


Figure 5.6: Location and extent of full build-out vegetated area at the **Eastern** site perimeter

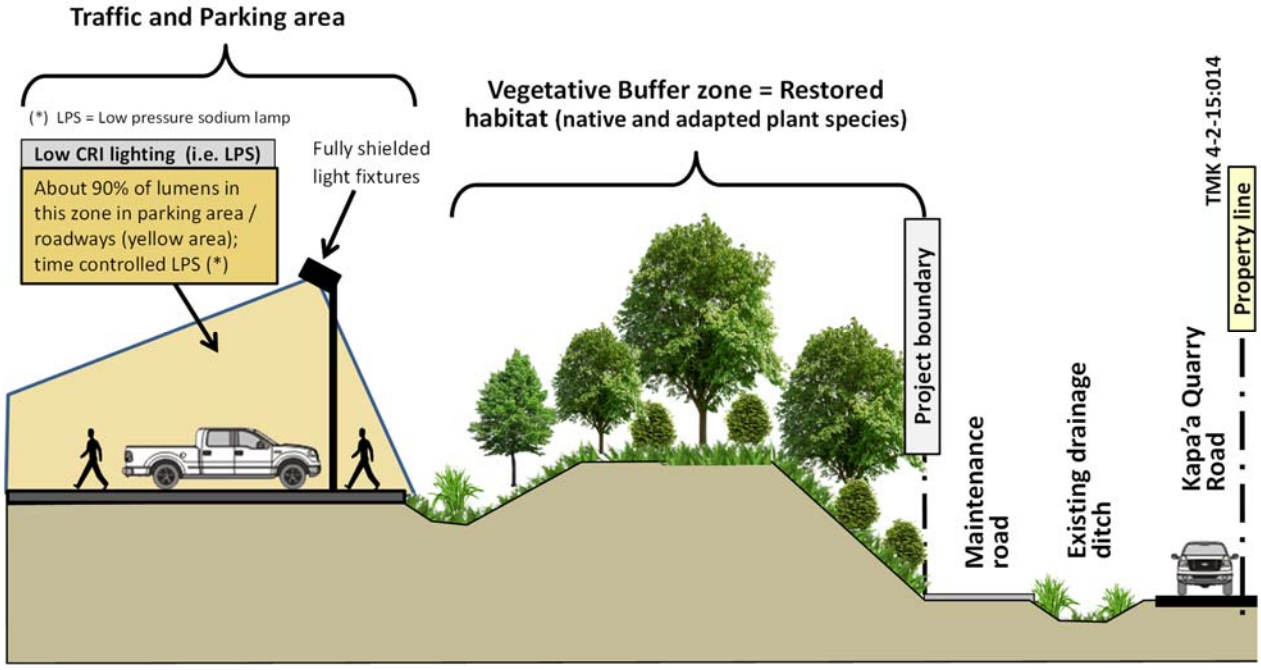


Figure 5.7: Concept of external lighting at the **Eastern** site perimeter at full build-out - Typical cross-section

Note: Concept illustration not to scale

Full Build-out vegetated perimeter at the **Southern** project site – typical section:

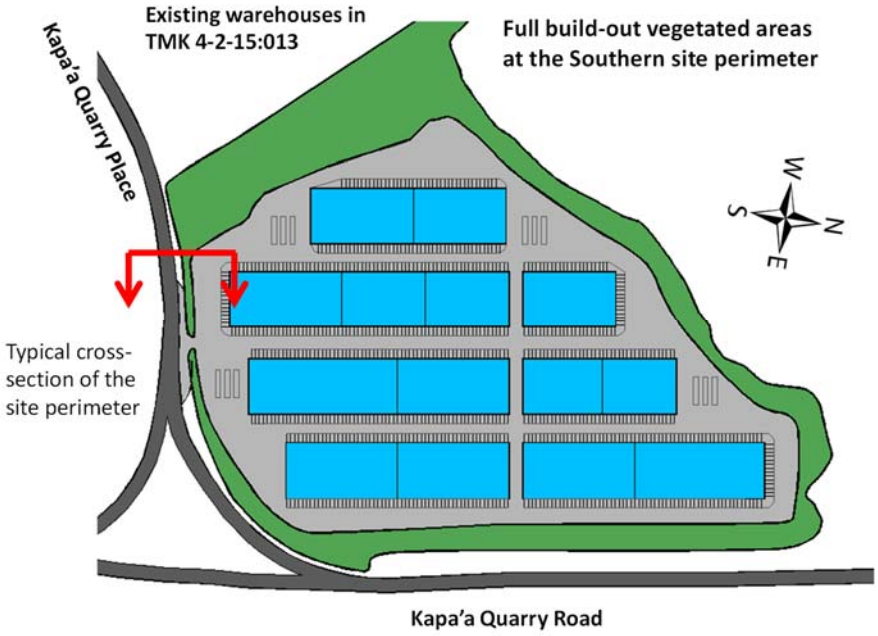


Figure 5.8: Location and extent of full build-out vegetated area at the **Southern** site perimeter.

The site perimeter in the South separates the development from the public roadway Kapa'a Quarry Place.

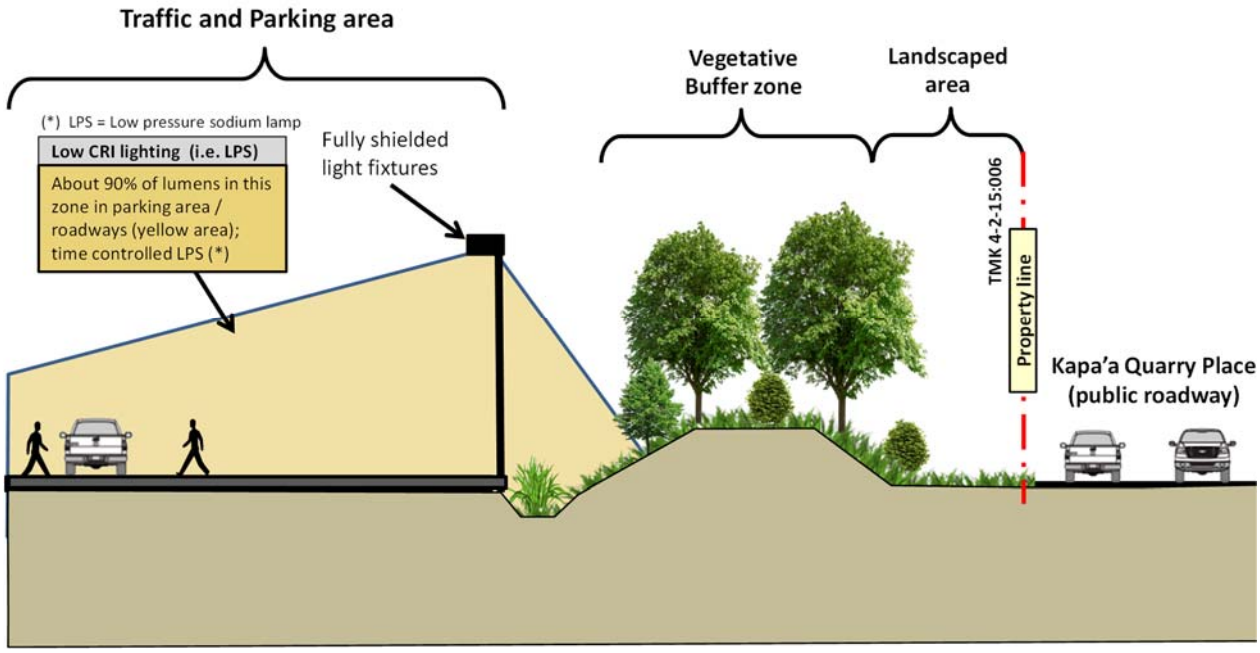


Figure 5.9: Concept of external lighting at the **Southern** site perimeter at full build-out - Typical cross-section

Note: Concept illustration not to scale

SECTION 6 - APPLICABLE EXTERNAL LIGHTING ORDINANCE AND CODES

The following development ordinances and codes apply to the design concept for the external lighting of the project site.

Revised Ordinances of Honolulu (ROH):

Chapter 21 (land Use ordinance) Article 4 Section 100 states:

Sec. 21-4.100 Outdoor lighting: For any commercial, industrial, or outdoor recreational development, lighting shall be shielded with full cut-off fixtures to eliminate direct illumination to any adjacent country, residential, apartment, apartment mixed use, or resort zoning district. (Added by Ord. 99-12)

City and County Energy Codes:

The City and County has adopted the 2015 International Energy Conservation Code (IECC). The energy standard American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2013 is also an accepted standard for applicable energy related issues, such as external lighting requirements. Both the IECC and ASHRAE lighting standards provide limits to lighting power densities (LPD). Figure 7.1 shows ASHRAE Table 9.4.5. "LPD for building exteriors". ASHRAE Table 9.4.5. is identical to the IECC Table 505.6.2 "LPD for building exteriors."

SECTION 7 - GUIDELINES AND RECOMMENDED ACTIONS TO REDUCE LIGHT POLLUTION

This section presents guidelines and recommended actions to reduce risks of the excessive lighting from new developments. Compliance with these guidelines and recommended actions is not mandatory in the same way as ordinances and codes are. These guidelines, however, provide important design criteria for effective impact mitigation.

Guidance of the National Park Service

The National Park Service suggests that whether within a national park and protected landscape or in a community concerned about its light footprint, planning is critical to retaining the quality of night skies.

- The **first step** of a successful planning to reduce excessive lighting is recognizing the night-related issues that need mitigation. There are two fundamental concerns, (1) to preserve the night sky for the human observer and (2) prevent animals from being harmed by excessive light. These two issues may be mitigated by the proposed mitigation measures.
- The **second step** is balancing the need for artificial lighting with the concern for the environment. Appropriate lighting is required for safety, security and to perform essential functions. The question is how much light is needed.
- The **third step** is implementing best mitigation approach for outdoor lighting. This approach includes choosing the right lighting devices (bulbs and luminaires and shielding) and choosing the right illumination intensity for the application.

TABLE 9.4.5 Lighting Power Densities for Building Exteriors

Uncovered parking areas	
Parking lots and drives	**0.15** W/ft^2
Building grounds	
Walkways less than 10 ft wide	**1.0** W/linear foot
Walkways 10 ft wide or greater	
Plaza areas	**0.2** W/ft^2
Special feature areas	
Stairways	**1.0** W/ft^2
Building entrances and exits	
Main entries	**30** W/linear foot of door width
Other doors	**20** W/linear foot of door width
Canopies and overhangs	
Canopies (free standing and attached and overhangs)	**1.25** W/ft^2
Outdoor sales	
Open areas (including vehicle sales lots)	**0.5** W/ft^2
Street frontage for vehicle sales lots in addition to "open area" allowance	**20** W/linear foot
Building facades	**0.2** W/ft^2 for each illuminated wall or surface or **5.0** W/linear foot for each illuminated wall or surface length

Figure 7.1: ASHRAE 90.1-2013 Table 9.4.5 Lighting Density for Building Exteriors

Guidelines by Illuminating Engineering Society of North America – IESNA

Guidelines by IESNA for outdoor ligation are frequently used to categorize appropriate lighting levels. Table 3.1 shows four categories of lighting zones defined by IESNA.

Table 7.1: IESNA Lighting zones

Lighting Zone	Ambient Illumination	Description of Default Location
LZ 1	Dark	National parks, recreation areas, and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone.
LZ 2	Low	Rural areas; including residential zones, neighborhood business districts, light industrial with limited nighttime use.
LZ 3	Medium	Urban areas, including commercial / industrial and high-density residential;
LZ 4	High	Note: all high activity districts in major metropolitan

Guidelines and credit requirements for LEED

U.S. Green Building Council (USGBC) administers the Leadership in Energy and Environmental Design (LEED) is a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes, and neighborhoods. The LEED credit for light pollution reduction (SS Credit 8, LEED V. 3) suggests specific initial illuminance values, allowable light trespassing, and allowable percentage of illuminance level to emit at angles larger than 90 degrees from nadir (straight down).

The project will be built in accordance with LEED certification standards. The proposed measured for light pollution reduction will earn one credit under the LEED V-3 New Building credit SS Credit 8 "Light Pollution Reduction". The full build-out site perimeter configuration along with the low impact site illumination will provide an effective impact mitigation strategy to qualify for LEED credit SS Credit 8 .

Guidelines by the International Dark-Sky Association (IDA)

The Outdoor Lighting Code Handbook by the International Dark-Sky Association (IDA) provides a comprehensive guide to reduce night-sky impacts from excessive outdoor lights. IDA also provides guidance on mitigating Effects of Artificial Light at Night on Wildlife.

SECTION 8 - EXTERNAL LIGHTING GUIDELINES APPLIED TO THE PROJECT

The following code requirements and guidance are implemented by the project:

- The maximum lighting power density will be below those provided by ASHRAE 90.1-2013
- The appropriate lighting zone will be selected for the land around the development, in accordance with IESNA.
- All external lights will be shielded following the recommendation of LEED to minimize light trespassing.
- The least harmful light bulbs (e.g., light color) to wildlife will be used.

SECTION 9 - SELECTING THE LIGHT ZONE FOR THE PROJECT SITE

The land around the project site falls into two different outdoor lighting zones designations. Figure 5.1 illustrates the two lighting zones surrounding the project site.

- Land with Lighting Zone LZ-3: The land to the West and adjacent to the project site is a densely developed industrial park. The land is zoned Intensive Industrial (I-2). There is not wildlife habitat in parcel TMK 4-2-15:013.
- Land with Lighting Zone LZ-2: The land to the North, West and South and adjacent to the project site is vegetated land with wildlife habitats.

The project site and adjacent areas are characterized as urban areas with light and intensive industrial use with limited nighttime use. Lighting zones are defined as shown in Figure 7.1 and are designated as LZ 2 and 3, which indicates low and medium ambient illumination.

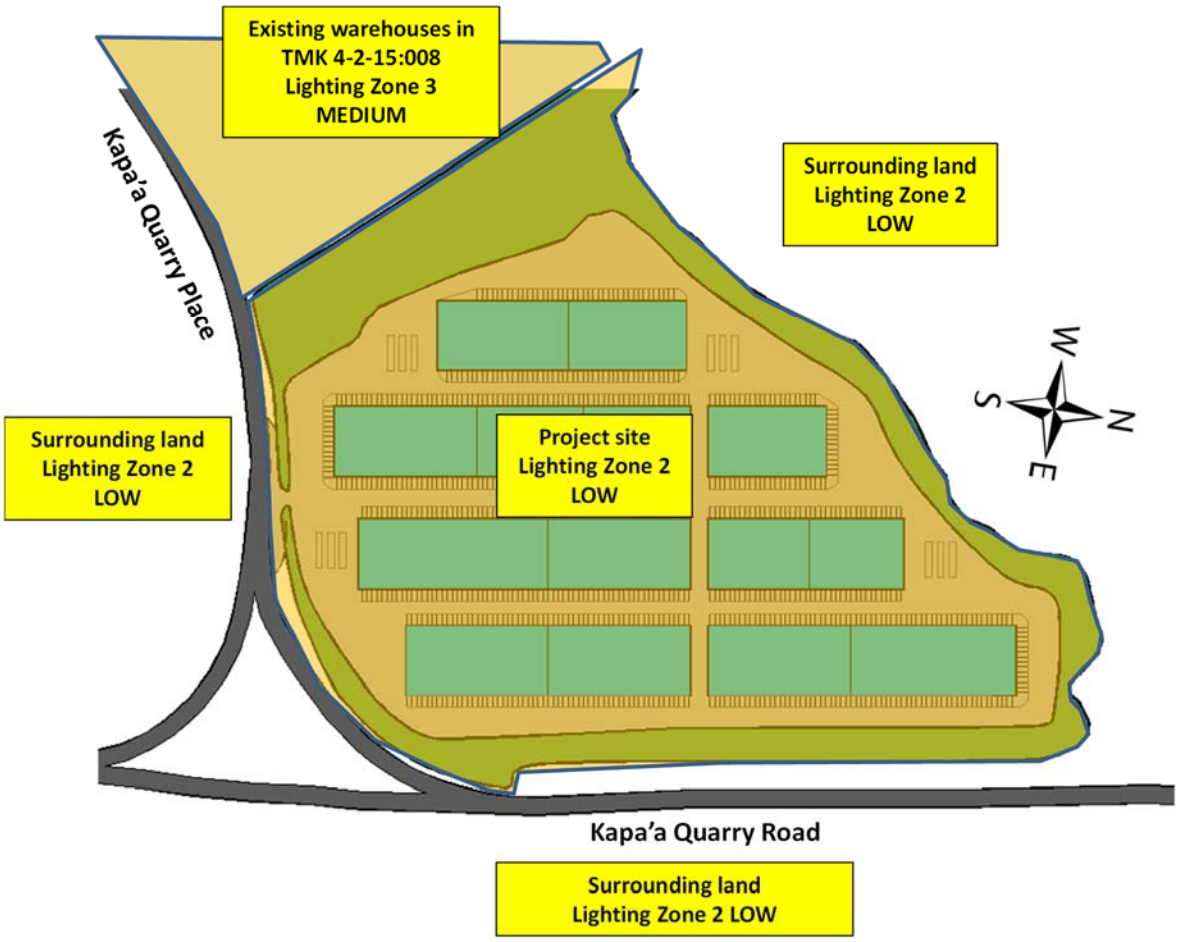


Figure 9.1: Lighting zones of project site and adjacent area

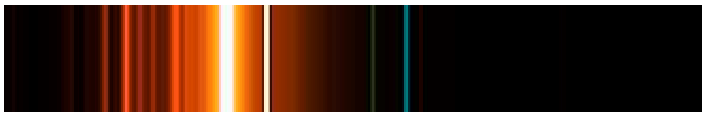
SECTION 10 - SELECTION OF LIGHT BULBS TO MINIMIZE EFFECT ON WILDLIFE

The selection of the right light bulb, and therefore of the light color, for the application has a great significance on the effectiveness of mitigating negative effect of excessive light on wildlife, and in particular on migrating birds.

Artificial night lighting harms species directly by triggering unnatural periods of attraction or repulsion that leads to disruptions in reproductive cycles, by fixation, by disorientation, or by interfering with feeding and sustenance. Light pollution has been shown to disorient migratory birds and hatchling turtles, disrupt mating and reproductive behavior in fireflies and frogs, and interfere with communication in animal species. (IDA, 2014)

There is evidence that the use of high and low-pressure sodium lights in ecologically sensitive areas such as wetlands, woods, and coastal areas has less impact on habitat and life cycle behavior than use of other types of light sources. The relatively monochromatic wavelength emitted by the yellow tinted sodium vapor lights attracts fewer insects and can be more easily filtered to minimize negative effects. Yellow lights such as high-pressure sodium (HPS) or low-pressure sodium (LPS) lamps should be used in environmentally sensitive areas. (IDA, 2014)

Low-pressure sodium lamps are used in some American cities, particularly those near active astronomical research facilities. The county of Hawaii (Big Island) has reported good results from using low-pressure sodium lamps for general roadway and parking lot lighting. Advantages of the low-pressure sodium lamps are the excellent high-efficacy and good maintenance of luminous output and long lifetime. Because of the poor color rendering, low-pressure sodium lamps can only be used in so-called "Class 2" lighting, where the perception of color is not necessary for the type of activity carried out under the lighting conditions.



Low-Pressure Sodium (LPS).
Spectrum 700 -- 350 nm

High-pressure sodium lamps are currently the most widely used high-intensity discharge (HID) lamps for roadway and parking lot lighting, though in some areas metal halide lighting is becoming more popular. Advantages include a long lifetime, a wide variety of moderate to high luminous output lamps (2000 - 120,000 lumens mean output), high efficiency and good maintenance of luminous output. Disadvantages include poorer color rendition than metal halide, fluorescent and incandescent, poorer output maintenance and efficiency than low-pressure sodium, and potentially hazardous mercury waste.

High-Pressure Sodium (HPS).
Spectrum 700 -- 350 nm

For internal traffic and parking area lighting of the project, the **low-pressure sodium lamp is preferred** over high-pressure sodium lamps since the type of light color spectrum produced by the low-pressure sodium lamps is less harmful to wildlife, especially migrating birds, than the color spectrum produced by high-pressure sodium lamps. Other lamp options, such as metal halide, are not considered for the roadway and parking lot lighting of the project.

The poor color rendering of the low-pressure sodium lamp makes this lamp unsuitable for functions where good color rendering is required for outdoor work functions, such as for loading operations. For lighting of the loading docks in the vicinity of the warehouses, LED lamps with a wide color spectrum and good color rendering index are more effective.

For illumination of loading docks and entrances where a good color rendering is required, **LED lighting** will be used in the project.

Figure 10.1 shows the locations within the project where low-pressure sodium lamps will be used for roadway and parking lot lighting.

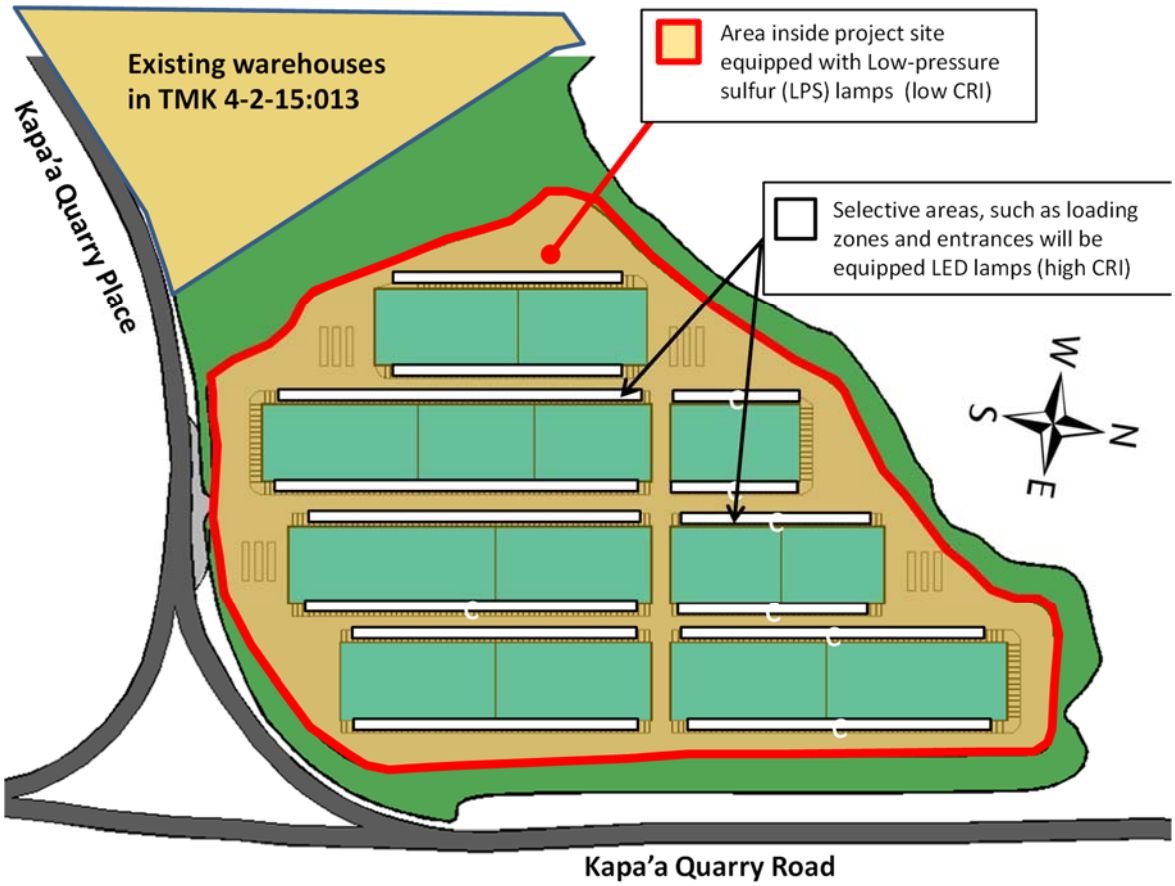


Figure 10.1: Areas within the project site where low-pressure sodium and LED lighting will be used

SECTION 11 - SELECTION OF LIGHT FIXTURES TO MINIMIZE EFFECT ON WILDLIFE

The primary cause of light pollution is outdoor lights that emit light upwards or sideways. Any light that escapes upward contributes to light pollution. Shielded light fixtures, also referred to as full cutoff fixtures, direct all light downward and greatly reduce the amount of light pollution. Some light does reflect off the ground and scatter through the sky, but this has a smaller effect than light that shines directly upward.

Figure 11.1 shows typical external lighting fixtures for roadway and parking lot lighting (e.g., low-pressure sodium lamps) and for loading dock lighting (e.g., LED lamps).

Typical shielded fixtures for low-pressure sodium (LPS) lamps proposed for roadway and parking lot lighting in the project

Typical shielded fixtures for LED lamps proposed for loading dock lighting in the project

Figure 11.1: Typical external lighting fixtures proposed for the project

The Illuminating Engineering Society of North America (IESNA) provides a classification scheme for external fixtures. Table 11.1 presents the allowable ranges of lamp lumens emitted upwards and between 80° and 90° from nadir. Figure 11.2 illustrates the definition of a full cutoff external lighting fixture.

Table 11.1: IESNA classification for external lighting fixtures

Luminaire classification	Range of allowable lamp lumens emitted upward	Range of allowable lamp lumens emitted between 80° and 90°
Full cutoff	0%	0 - 11%
Cutoff	0 - 16%	0 - 11%
Semicutoff	0 - 31%	0 - 22%

Figure 11.3 compares the color rendering characteristics of LED lighting fixtures compared to lighting of monochromatic lights, such as provided through a low-pressure sodium lamp. Figure 7.4 shows a typical lighting scenario of a roadway and parking lot lighting with low-pressure sodium (LPS) lamps. In Figure 11.4, the poor color rendering of the LPS lamps, acceptable for the traffic and parking area lighting, is illustrated.

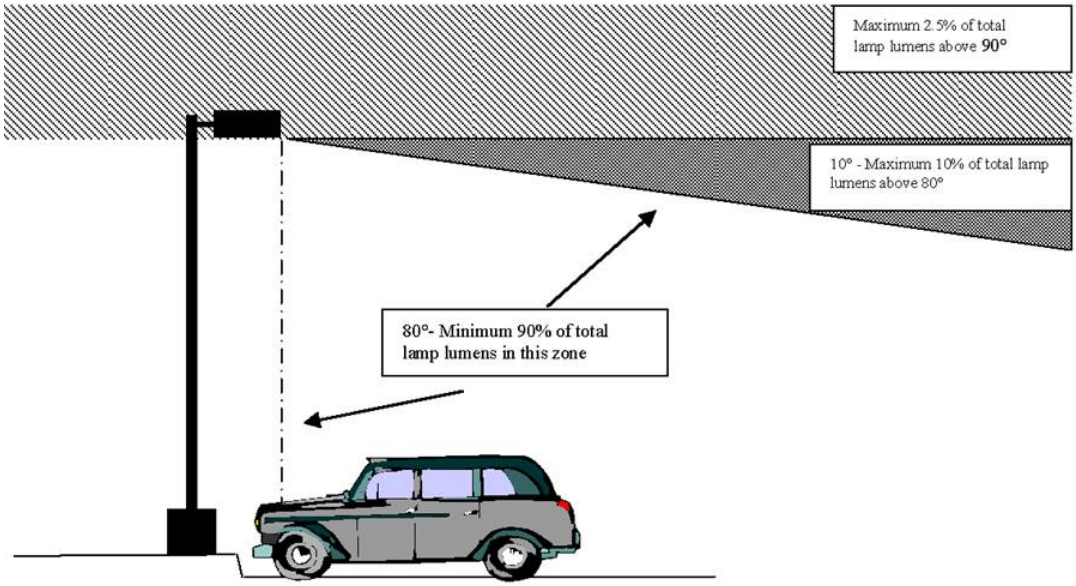
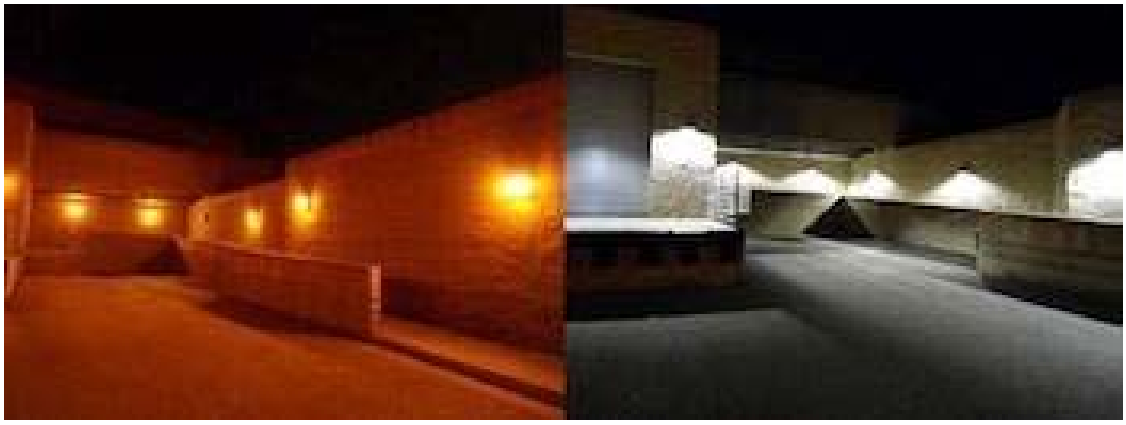


Figure 11.2: Illustration of the IESNA classification of external fixtures (full cut-off)



Loading dock with monochromatic lights (such as provided by low-pressure sodium lamps; **color rending is virtually non-existent (e.g., low CRI)**

Loading dock with full spectrum lights (such as provided by LED lamps; **color rending is good (e.g., high CRI)**

Figure 11.3: Comparisons of a loading dock using lights with different color rendering capabilities

Figure 11.4: Example of parking lot lighting with low-pressure sodium lamps (low CRI)

SECTION 12 - PROPOSED INSTALLATION OF EXTERNAL LIGHTING AT THE PROJECT SITE

The proposed installation methods for the two types of external lighting fixtures are illustrated for the low-pressure sodium (LPS) and the LED fixtures in Figures 12.1 and 12.2, respectively.

Figure 12.1 shows a typical installation approach, where the LPS traffic area illumination overlaps the loading zone illumination. The LED light has a higher color rendering index (CRI) than the LPS lights which are mainly used inside the site. The higher CRI LED-illumination supports loading operation when it is of importance to distinguish colors. Figure 12.1 illustrates that shielding of the LPS lights avoids significant light trespassing into the vegetative buffer zone. The combination of effective light shielding, and the light obstruction function of the vegetative buffer zone, avoids any direct light trespassing into adjacent land.

Figure 12.2 shows a typical cross-section where low pressure sodium lamps (LPS) illumination overlaps smaller zone LED illumination for entrances or emergency equipment.

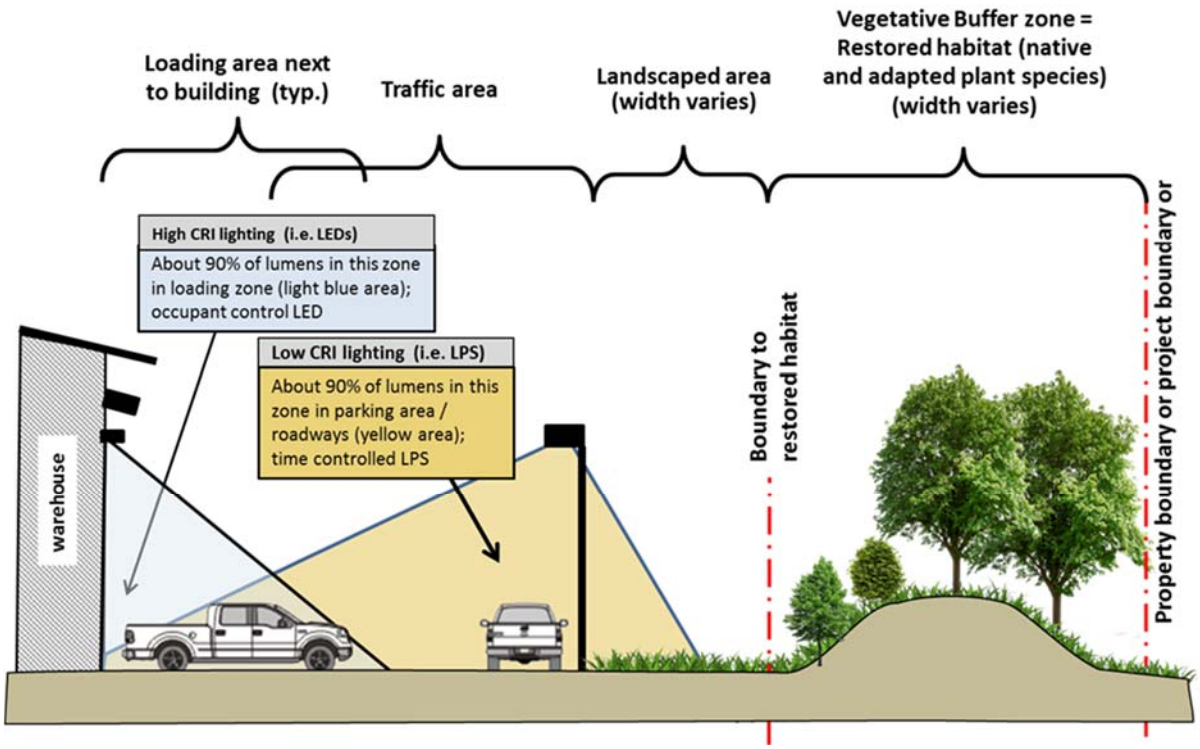


Figure 12.1: Typical cross-section for lighting installation on traffic areas with loading zone illumination

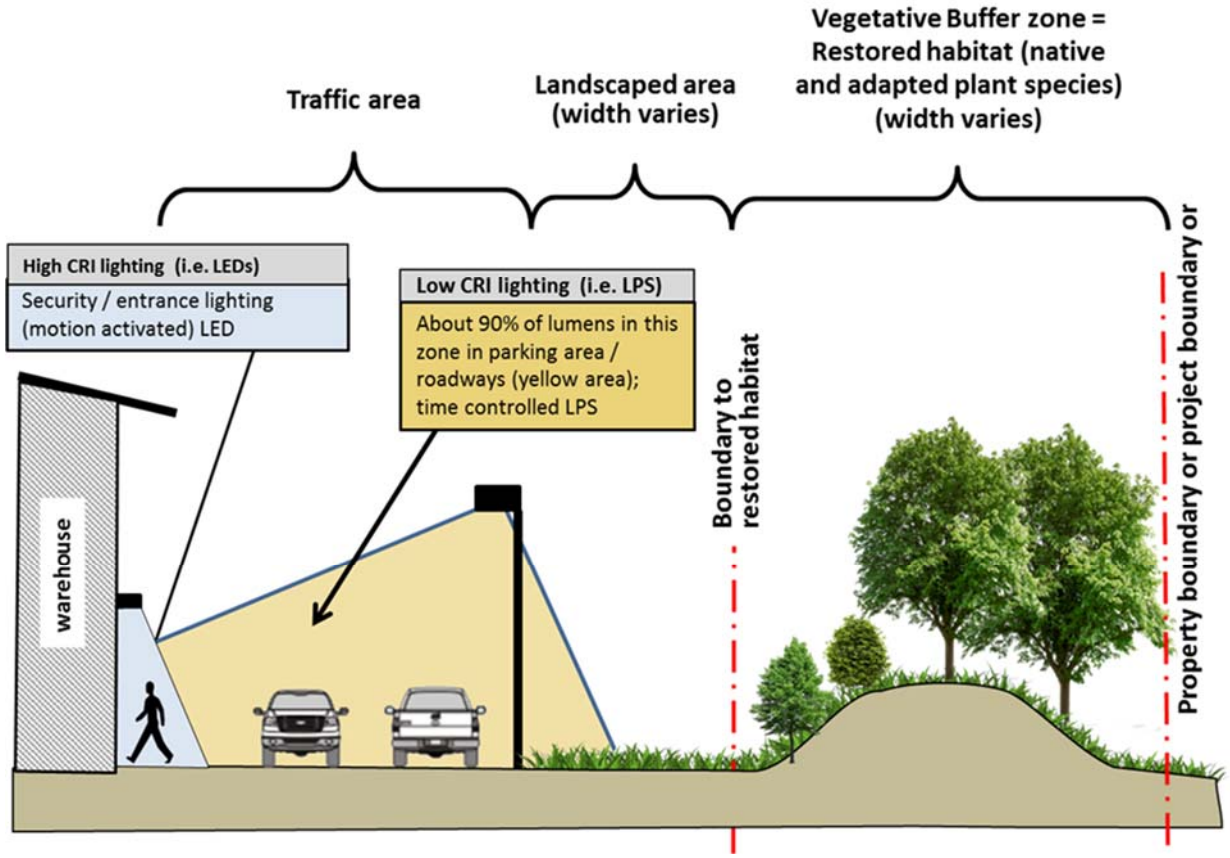


Figure 12.2: Typical cross-section for lighting installation on traffic areas with Security / entrance lighting illumination

SECTION 13 - SUMMARY OF THE LIGHTING DESIGN GUIDELINES

The following design guidelines will be the basis for the detailed design of the lighting system. The detailed design will include the exact locations, the light power density of the two types of external lighting fixtures and the type of lighting products.

- The project site and adjacent land, vegetated land and the highly developed land, is categorized in accordance with light zones as LZ2 and LZ3.
- The amount of light trespassing into the adjacent land follows the recommendation of the LEED credit for light pollution reduction. The selection of the shielded (e.g., full cut-off) external light fixtures will ensure light trespassing control in accordance with the LEED guidelines.
- The light power densities for external lighting follow the energy code and the ASHRAE 90.1 standards.
- Low-pressure sodium (LPS) lamps are selected for roadways and parking lot illumination within the project site, as their monochromatic spectrum is reported as causing the least negative impacts on wildlife. The low color rendering capability of low-pressure sodium lamps is acceptable for the intended function, and their environmental benefits support the selection. The extent of the roadways and parking lot area within the project site that will be illuminated with LPS lamps as shown in Figure 10.1. The proposed installation method for LPS fixtures as illustrated in Section 12. The basic design objective for project site immunization is supplying the lowest acceptable light level and avoid significant light trespass to adjacent land.
- LED external fixtures are limited to areas where color rendering is of concern, such as for loading docks and for building entrances. The proposed installation method for LED fixtures at the loading docks on the Eastern side of buildings as illustrated in Section 12.

REFERENCES

ANSI/ASHRAE/IES (2010) Standard 90.1-2013: Energy Standard for Buildings Except Low-Rise Residential Buildings

City & County of Honolulu (2014) Revised Ordinances of Honolulu (ROH)

Illuminating Engineering Society of North America (IESNA) (2008) Technical Reference Guide RP-33

International Dark-Sky Association (2014) "IDA Practical Guide: Effects of Artificial Light at Night on Wildlife" http://www.darksky.org/assets/documents/PG2-wildlife-bw.pdf accessed 10/4/2014

National Park Services (2014) "Natural Sounds & Night Skies: Best Practices" C:\0_working files\0_SDC_projects\2013-10-Kapaa SMA permit\project work\external lighting\information\NPS Explore Nature » Night Skies » Managing Lights capes » Best Practices_cfm.mht accessed 10/4/2014

U.S. Green Building Council (USGBC) (2015) Leadership in Energy and Environmental Design (LEED) New Construction, Reference Guide

Appendix I:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

BUFFER ZONE DEVELOPMENT PLAN
(NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop the

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final SEIS

Appendix I

Revised Development Approach for the Buffer zone

Around TMK 4-2-15:014 (Lower Site)

Updated report based on a buffer development plan that was accepted in 2016 by the Hawaii Department of Land and Natural Resources (DLNR) and the Department of Planning and Permitting

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

About the Report

The conditional zone change (City and County of Honolulu, Ordinance 13-35) for the land parcel TMK 4-2-15: 014 itemizes submittal and acceptance of the development approach of the buffer zone around the rezoned land as one point of the Unilateral Agreement.

The proposed design concepts for the construction of the vegetated buffer zones at the project site perimeter were accepted in 2016 by the Department of land and natural Resources (DLNR). This technical report updates several site development details since the site layout has changed after the original buffer development concepts were accepted. The updates described in this report, however, do not change the accepted design concepts of the vegetated buffer zones.

Sustainable Design & Consulting LLC acts as the Consultant to the developer of the land, Kapa'a I, LLC and has developed this technical proposal.

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

MANFRED J. ZAPKA
LICENSED PROFESSIONAL ENGINEER
No. 13213-C
HAWAII U.S.A.

Expiration Date: 04/30/22

ACRONYMS

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
CRI	Color Rendering Index
HID	High-intensity Discharge (lamp)
HPS	High-Pressure Sodium (lamp)
IDA	International Dark-Sky Association
IECC	International Energy Conservation Code
IESNA	Illuminating Engineering Society of North America
LED	Light-emitting Diode (lamp)
LEED	Leadership in Energy and Environmental Design
LPD	Light power density
LPS	Low-Pressure Sodium (lamp)
LZ	Lighting Zone

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EXECUTIVE SUMMARY

This technical report describes the proposed design concept to develop the vegetated buffer zones at the site perimeter of the lower of portion Kapa'a Light Industrial Park in TMK 4-2-15:014. The present report refers to this development approach as the "*development of the buffer zone area adjacent to the rezoned land in TMK 4-2-15:006*". The buffer zone that will be improved in conjunction with development of the light industrial park is located partially within and partially outside the rezoned land.

In 2018 the three former parcels TMK 4-2-15:006, 008 and 012 on which the Kapa'a Light Industrial Park is located, was redesigned with new as TMK designated. The former TMK 4-2-15:006 and 012 are now the lower and upper portions of new TMK 4-2-15:014. The former TMK 4-2-15:008 is now TMK 4-2-15:013.

The 25-acre project site within the lower portion of TMK 4-2-15:014 will contain 14 warehouse buildings restored habitat areas in the buffer zones at the site perimeter. The construction work to develop the site and build the structures will be carried out in three major construction phases and following a development schedule that depends on demand for leasable space.

This report describes the proposed design concept of developing new buffer zones along the entire site perimeter. In general, buffer zones perform important impact mitigation functions, including visual impact mitigation, as well as noise and dust impact mitigation. The new and improved vegetated areas at the site perimeter with dense and attractive vegetation of sufficient height and width will provide effective buffer zones.

At the present the site is surrounded with vegetated areas at all sides. The existing buffer zones contain shallow earth berms. The existing berms will be extended in width and height under the new perimeter buffer development plan. The vegetation within the existing buffer zones includes mostly non-native and invasive plants which are not managed at the present. The vegetation within the improved buffer zones will be native and adapted plant species, and will be landscaped.

Effective visual impact mitigation is an important concern for the site perimeter at the East side of the site. At the eastern side, the development borders at Kapa'a Quarry Road and the Kawainui Marsh. Since the existing vegetation will be removed to construct the new earth berm, only low vegetation will be present until trees and bushes have attained a sufficient height to act as an effective screen. Planting of the first screen with fast growing trees and shrubs will reduce the period when the site will be visible from the adjacent land. Establishing a diverse and final population of native and adapted plants in the vegetative buffer zones will take several years.

In 2016 the Department of Land and Natural Resources (DLNR) accepted the initial design concept of developing a buffer zone on new site perimeter berms. The original and accepted design concepts were applied to the new site layout and therefore the intent of the buffer development plan remains unchanged.

SECTION 1. BACKGROUND AND OBJECTVES

The Unilateral Agreement and Declaration for Conditional Zoning of Ordinance 13-35, executed by the City Council, City and County of Honolulu, states that the Owner of the rezoned land including portions of land parcel TMK 4-2-15: 014 (lower portion of) is required to submit for review and approval the Department of Planning & Permitting (DPP) the proposed development approach for the development of the buffer zone.

Section 2of the Unilateral Agreement (UA) and Declaration for Conditional Zoning of Ordinance 13-35 states:

> *2. Buffer Zone. The approximately 29.9 acres of land abutting the zone change area and also within the parcels identified as Tax Map Keys: 4-2-15: 6 and 12 shall remain in the P-2 General Preservation District to serve the purpose of a buffer zone for industrial uses on the Land. The Declarant shall establish and maintain the buffer zone, as required by the DPP, to sufficiently mitigate noise and visual impacts through landscaping that includes earth berms and vegetation that includes tall trees and shrubs. Prior to the issuance of any development permit in the buffer area, the proposed project shall be submitted to the DPP for review and approval to ensure it meets the purpose of the buffer area. The portion of the buffer zone within the parcel identified as Tax Map Key: 4-2-15: 12 contains an existing detention basin which shall be allowed to serve the function of stormwater management for the adjacent zone change area.*

In 2016 the DLNR reviewed the original Kapa'a conceptual plan of establishing a vegetation buffer around the Lower site, specifically along the Kapa'a Quarry Road and Kawainui State Park Reserve. In the letter dated March 21, 2016 DLNR stated that the conceptual plan was adequate to establish the vegetation buffer around the Lower site.

DLNR further encouraged the use of appropriate native vegetation rather than introduced species that are not in keeping with the existing landscape of Kawainui.

The DLNR recommendations were endorsed by the Department of Planning and Permitting (DPP).

Figures 1.1 and 1.2 show the letters sent by DLNR and DPP, respectively.

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
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JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 21, 2016

'16 MAR 24 AM 10:08

Mr. George I. Atta, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

Dear Mr. Atta:

SUBJECT: Kapa'a Light Industrial Park Buffer Area Development Proposal, Kailua, O'ahu
TMK: 4-2-15: por. 06 Project No. 2012/Z-6

Thank you for the opportunity to review and comment on the buffer proposal for the Kapa'a Light Industrial Park situated along Kapa'a Quarry Road and along the western side of Kawainui Marsh. The northern boundary of the project area is defined by Kapa'a Stream, which is adjacent to Kawainui State Park Reserve. The Department of Land and Natural Resources (DLNR) has encouraged vegetation buffers that will mitigate the visual impacts to the Park and the Kawainui Wildlife Sanctuary.

The conceptual plan by the applicant, Kapaa 1, LLC, proposes vegetation buffers around the perimeter of the 24.5-acre project area to mitigate the visual impacts of the warehouse buildings, baseyard, and parking areas. The graphic representations of these buffers indicates that the height of the trees will correspond to the height of the buildings with lower level shrubs to block the visual impacts for vehicles travelling along Kapa'a Quarry Road. Existing dirt berms around the perimeter will be improved and used as the foundation for the vegetation buffer.

The plan proposes several trees and shrubs for the buffer, including both native and fast growing introduced species. To retain the existing elements of the landscape around Kawainui Marsh and promote the use of appropriate native plants, we would like to make the following recommendations:

- Consider planting several monkeypod trees along Kapa'a Quarry in Section D. These trees already line much of the roadway and would promote continuity to the existing vegetation pattern, as well as providing shade and a visual buffer.
- Encourage the use of fast growing native trees such as milo, kou, and kukui.
- Discourage the use of trees such as the Norfolk pine, cypress, and eucalyptus that are not currently found at Kawainui.

Figure 1.1: Letter by DLNR accepting the conceptual plan of the buffer zones around the Lower site (part1)

Mr. George Atta
March 21, 2016
Page 2

- Naupaka is probably be the most effective native shrub to give the thickness and height needed for a visual buffer.

- Conduct research into appropriate riparian vegetation for planting along Kapa'a Stream. The Division of Forestry and Wildlife (DOFAW) is undertaking a restoration project along Kahanaiki Stream at the mauka end of Kawainui Marsh and may be of assistance.

In summary, we believe the conceptual plan adequately addresses the goal of establishing a vegetation buffer along Kapa'a Quarry Road and Kawainui State Park Reserve. However, we would encourage the applicant to give greater consideration to the use of appropriate native vegetation rather than introduced species that are not in keeping with the character of the existing landscape at Kawainui.

Sincerely,

Suzanne Case, Chairperson

Cc: Division of Forestry and Wildlife
Division of State Parks

Figure 1.1: Letter by DLNR accepting the conceptual plan of the buffer zones around the Lower site (part2)

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
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KIRK CALDWELL
MAYOR

GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

2016/ELOG-222 (TH)
2012/Z-6

April 14, 2016

Mr. Manfred J. Zapka, P.E.
Sustainable Design and Consulting, LLC
P. O. Box 25914
Honolulu, Hawaii 96825-0914

Dear Mr. Zapka:

SUBJECT: Kapaa Light Industrial Park Buffer Area Development Proposal
Kailua, Oahu, Tax Map Key (TMK): 4-2-015: Portion of 006

We have reviewed your proposed concept plan for a vegetated buffer to be installed along the perimeter of TMK: 4-2-015: 006 and find it in compliance with Condition 2 of the Unilateral Agreement attached to Ordinance 13-35. This proposed concept plan is the second of two buffer area development proposals submitted by the Applicant, Kapaa 1, LLC, to satisfy Condition 2.

The State Department of Land and Natural Resources (DLNR) submitted comments on this concept plan dated March 21, 2016 (attached) that recommends the use of native vegetation rather than introduced species to maintain the character of the existing landscape at Kawainui. We suggest that you give due consideration to the DLNR's recommendations.

Very truly yours,

George I. Atta, FAICP
Director

GIA:bkg

Attachment

Figure 1.2: Letter by DPP endorsing the DLNR recommendations

SECTION 2 - MAJOR DESIGN GUIDELINES OF PROPOSED BUFFER ZONE DEVELOPMENT APPROACH

The following design principles of the proposed buffer development approach for rezoned land in TMK 4-2-15:014 (lower portion of) were established as follows:

1. The buffer zone adjacent to the lower portion of the project site (in Parcel TMK 4-2-15:014) is presently vegetated. The developer will improve the existing land buffer zones between development footprint and adjacent land by constructing new or larger earth berms. Exiting vegetation will be replaced by native and adaptive plants.

2. The buffer zones on the four cardinal sides of the project site will have slightly different functions, as follows:

   - The buffer zone on the East of the project site will provide effective visual impact mitigation by establishing a dense and sufficiently high screen of tall trees and shrubs. The buffer zone will also mitigate noise impacts. The Kapa'a Quarry Road is located directly adjacent to the site and direct views of buildings on the site should be screened by vegetation.

   - The buffer zone to the North of the site will act as an effective screen that separates the development from the adjacent Kapa'a Stream corridor. In addition, this section buffer zone will also provide noise impact mitigation and will protect the stream corridor from storm water related impacts.

   - The topography of the buffer zone at the West of the site will largely remain in its existing condition, which is a steeply sloped section of land that separates the project site from the existing warehouse development in parcel TMK 4-2-15:013 (located on an about flat plateau, approximately 40 feet above the finish grade of the Lower site). While the slope of the land will remain unchanged, the existing vegetation will be supplemented by native and adapted plants.

   - The buffer zone in the South will mainly serve as visual impact mitigation. The Kapa'a Quarry Place roadway is located directly adjacent to the site. The existing earth berm in this section of the site perimeter will have a reduced height to allow good visibility for site traffic ingress and egress. Tall trees and shrubs will be planted at appropriate locations to block direct views of the development.

3. The development of the buffer zones will proceed in conjunction with the different development and construction phases of the light industrial park in the Lower site TMK 4-2-15:014. Certain sections of the existing shallow site perimeter berms serve as construction storm water best management practices (BMP). They needed to be maintained until they can be safely removed and replaced with new buffer zones.

4. The storm water management of the full build-out site will feature a rainwater harvesting system, which will provide irrigation water for the buffer zones and some small, landscaped areas with trees inside the site. The use of native and adapted plants will decrease the need for irrigation and fertilizers.

SECTION 3 - DESCRIPTION OF THE PROJECT SITE

Figure 3.1 shows the site location, on the windward side of O'ahu. The project site is located in the lower stretches of the Kapa'a Valley. The site's distance to the western border and center of the Kawai Nui Marsh is 0.1 and 0.6 miles, respectively.

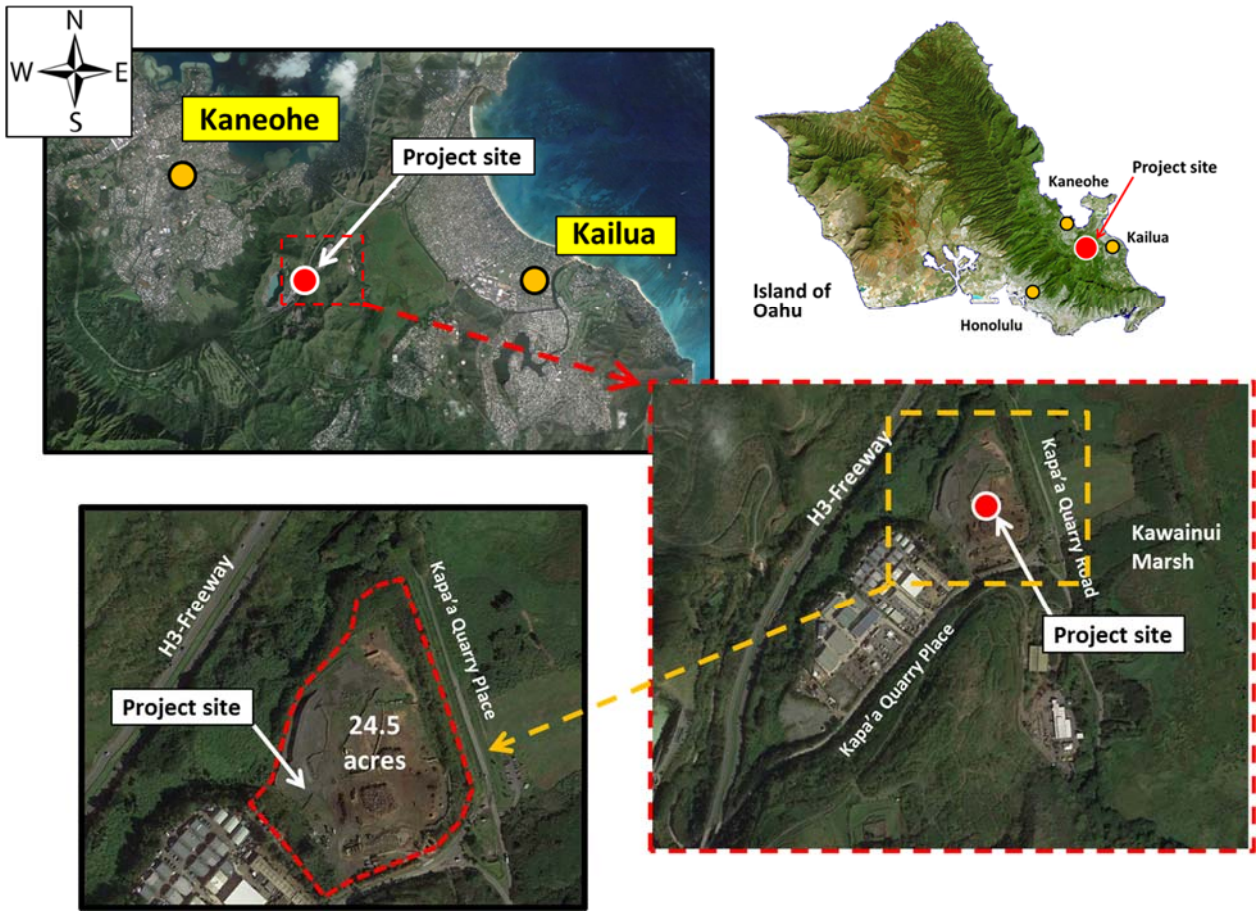


Figure 3.1: Site location

Figure 3.2 indicates that the project site is located inside the "Urban" State Land Use District.

Figure 3.3 shows the legal boundaries and the County land use zoning of the project and adjacent land. The project site was rezoned from P-2 to I-1. The project site is surrounded by land parcels with different land use designations.

Figure 3.4 shows the specific zoning of parcel TMK 4-2-15:006. Figure 2.4 indicates that the project site occupies only a portion of land parcel 4-2-15:006. The 24.5-acre project site is zoned as Limited Industrial (I-1) whereas the remaining 20 acres of the parcel were not rezoned and are within the General Preservation (P-2) zoning district.

Figure 3.5 shows that the project site is within the Special Management Area (SMA). Land within the SMA Status 1 area requires effective impact mitigation.

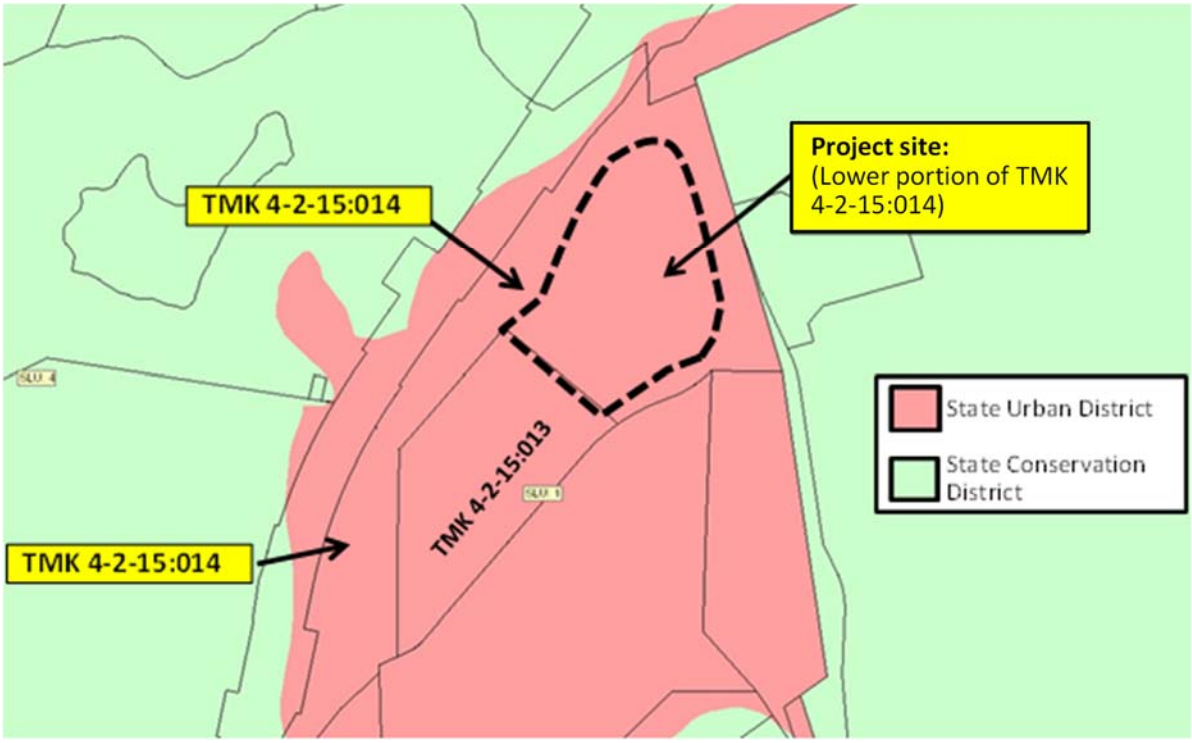


Figure 3.2: Project site is located within the "Urban" STATE LAND USE DISTRICT

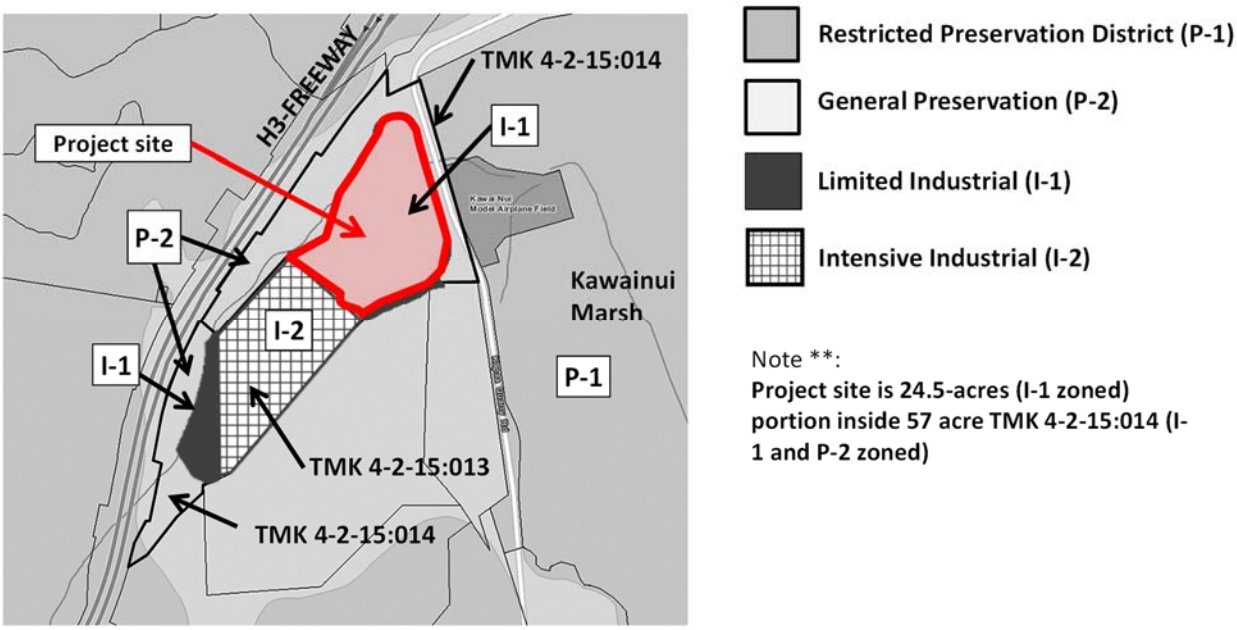


Figure 3.3: Legal boundaries (County) of the project site and adjacent land

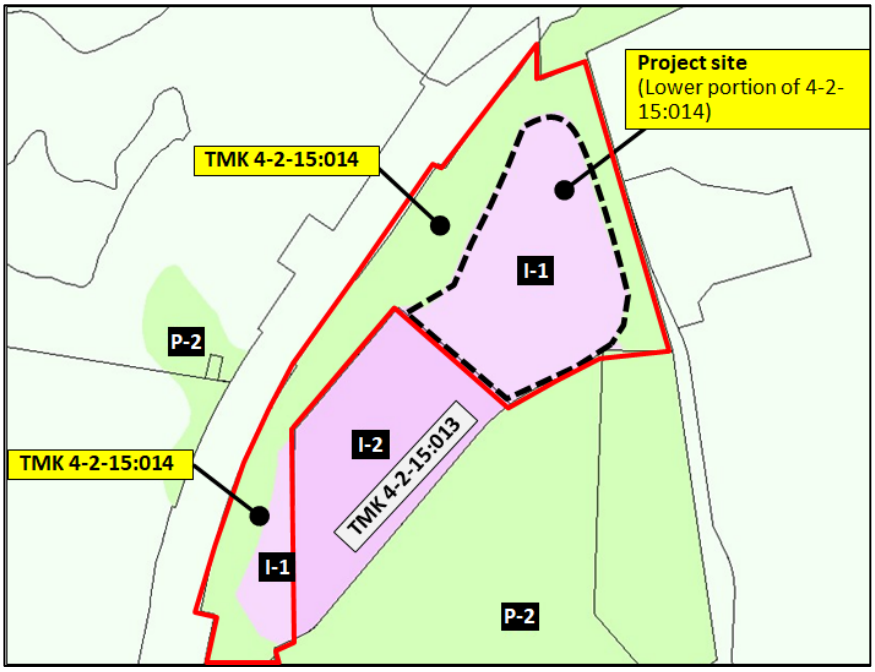


Figure 3.4: Project site is located within County Limited Industrial Zone

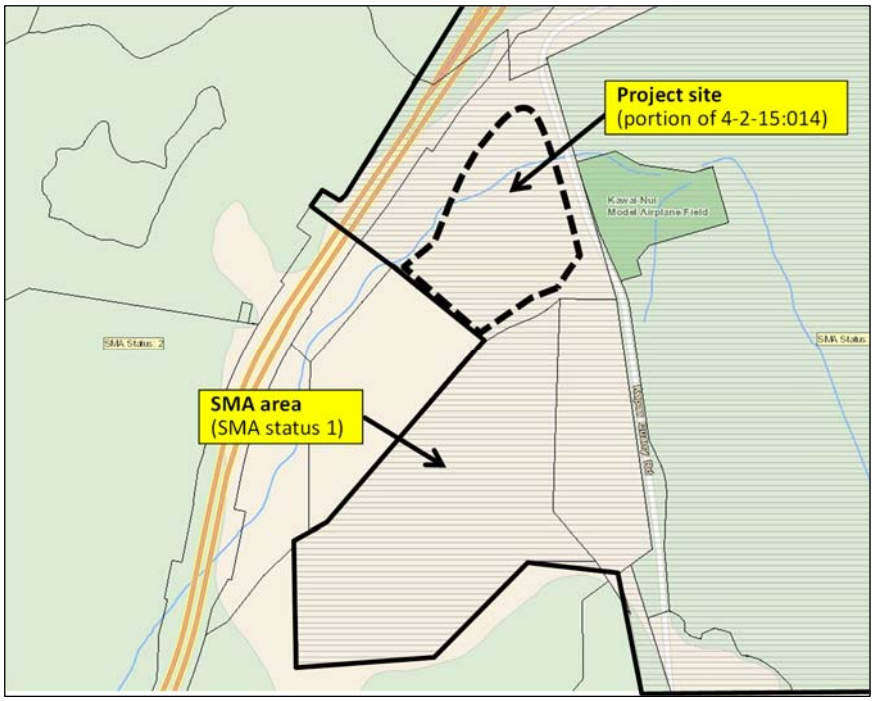


Figure 3.5: Project site is located within Special Management Area (SMA status 1)

Figure 3.6 illustrates the location of the project site relative to environmentally sensitive land, including the Kapa'a Stream corridor to the North-West and the Kawaii Nui Marsh to the East of the project site. The figure depicts the present conditions at the site. The project site is located on a former landfill, which was created from domestic waste and quarry tailing and overburden. No part of the project site occupies vegetated land in the Kapa'a Stream corridor. The Kapa'a Stream is a 303-listed inland water body. The Kapa'a Stream is the main drainage for the 900-acre Kapa'a Valley. The Kapa'a Stream streambed was

offset several hundred feet to the North when the landfill was formed. The existing streambed is situated between the H3-Freeway and the landfill.

Figure 3.7 shows the topography of the project site and the immediate adjacent land inside the Kapa'a Stream corridor around 2015. Figure 3.8 shows the topography within the project site in the most recent topographic map. The topography of the adjacent Kapa'a Stream corridor remains unchanged in Figure 3.8 from the Figure 3.7.

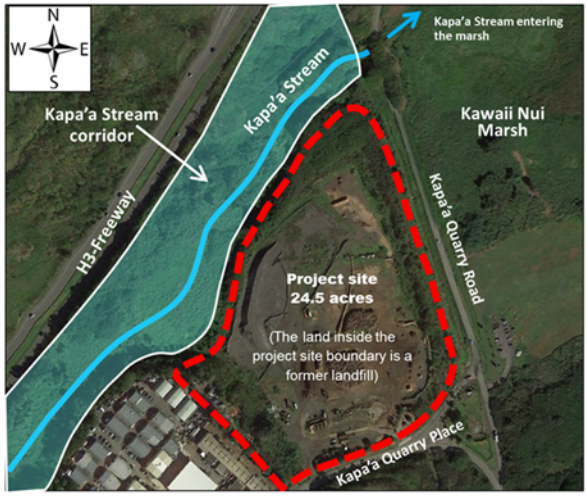


Figure 3.6: Project site and adjacent land use

The project site is located on land that was formed by a former landfill. The project site will not occupy any environmentally sensitive land, especially land inside Kapa'a Stream corridor. The Kapa'a Stream corridor is located between the H3-Freeway and the landfill area.

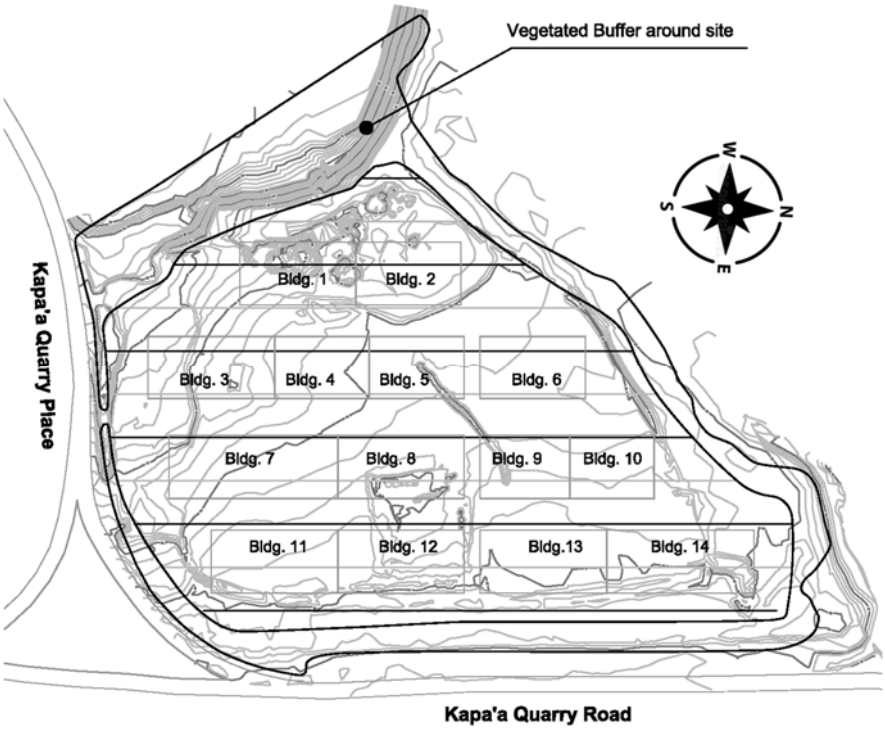


Figure 3.7: Project site – topography around 2017

Figure 3.7 shows a 2017-topographic rendering of the existing grade within the lower site. The contour lines indicate that the existing grade shows an elevation gradient towards the North-East corner of the site. The elevation drop from the South -West to the North-East corner of the proposed development site is approximately 35 feet. The average slope of the site as shown is 2.5%. The proposed 14 buildings in the Lower site are indicated.

Figure 3.8 shows the 2017 topographic survey. Some grading has been ongoing under a current grading permit.

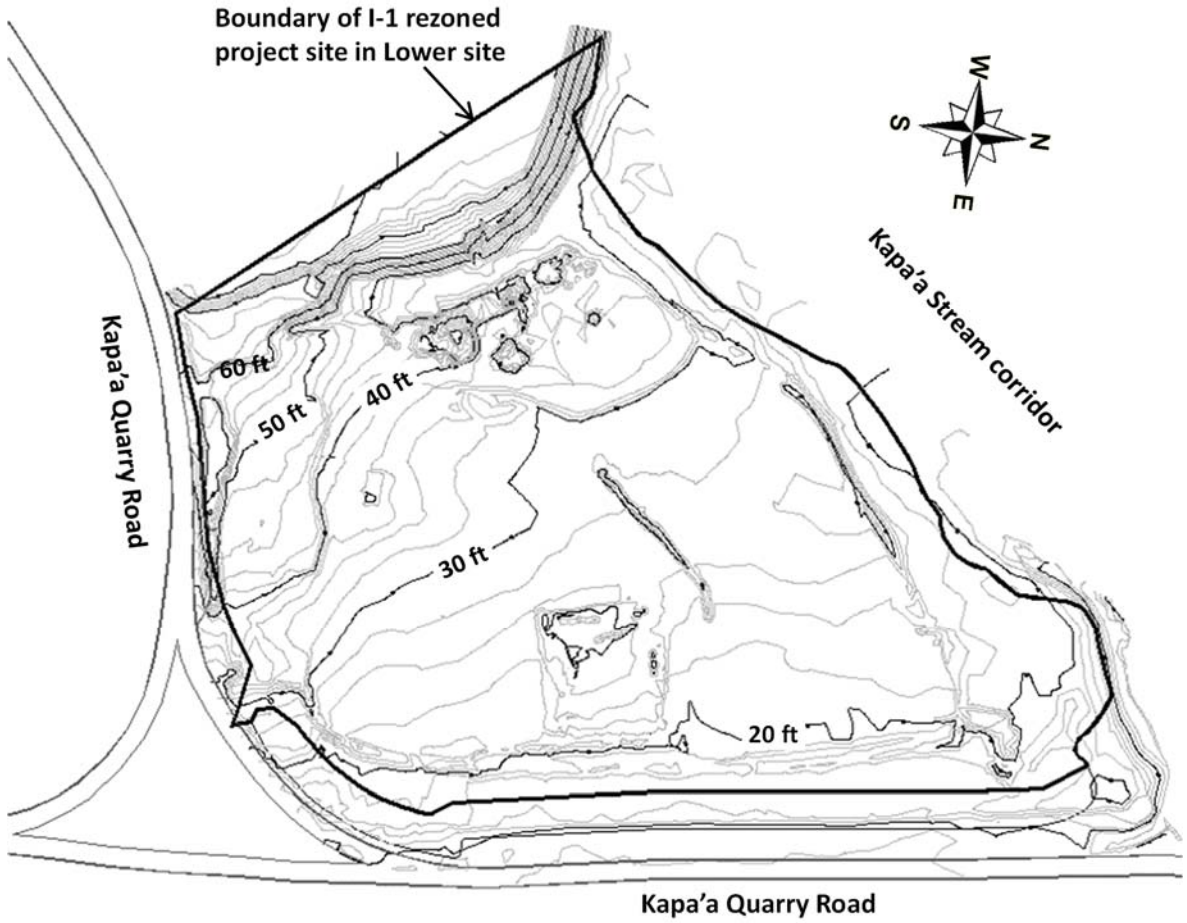


Figure 3.8: Project site – 2017 topographic survey

SECTION 4 - SITE DEVELOPMENT AT FULL BUILD-OUT

Figure 4.1 shows the full build-out project.

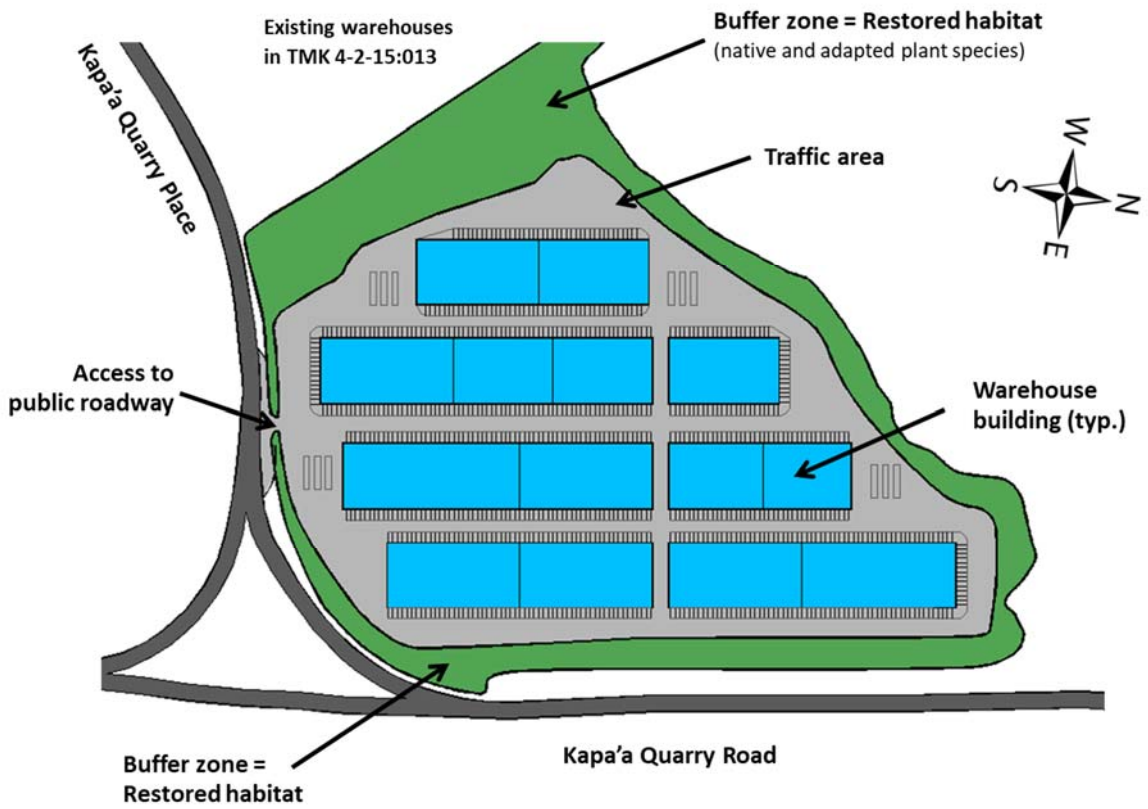


Figure 4.1: Project site and adjacent land use project site

The project site in the Lower site is situated inside the 59-acre parcel TMK 4-2-15:014. The Lower project site has a total area of 25 acres. The remaining 20 acres in parcel TMK 4-2-15:014 will stay in their existing condition, which is densely vegetated land within the Kapa'a Stream corridor. Of the 25-acre Lower project site, 19 acres will be covered with impervious pavement and buildings. The remaining 6 acres will include landscaped area inside of the site and vegetative buffer zones at the site perimeter.

The current plan of the light industrial development includes 14 warehouses, with building floor space ranging from 15,000 to 36,000 square feet. While the actual amount of light industrial warehouse space may vary in the final design, the development will only have warehouse buildings. Therefore, the type of impact mitigation achieved by the buffer zones will be the same in applicable development of the light industrial park.

Figures 4.2 and 4.3 show the project site with a bird's eye view.

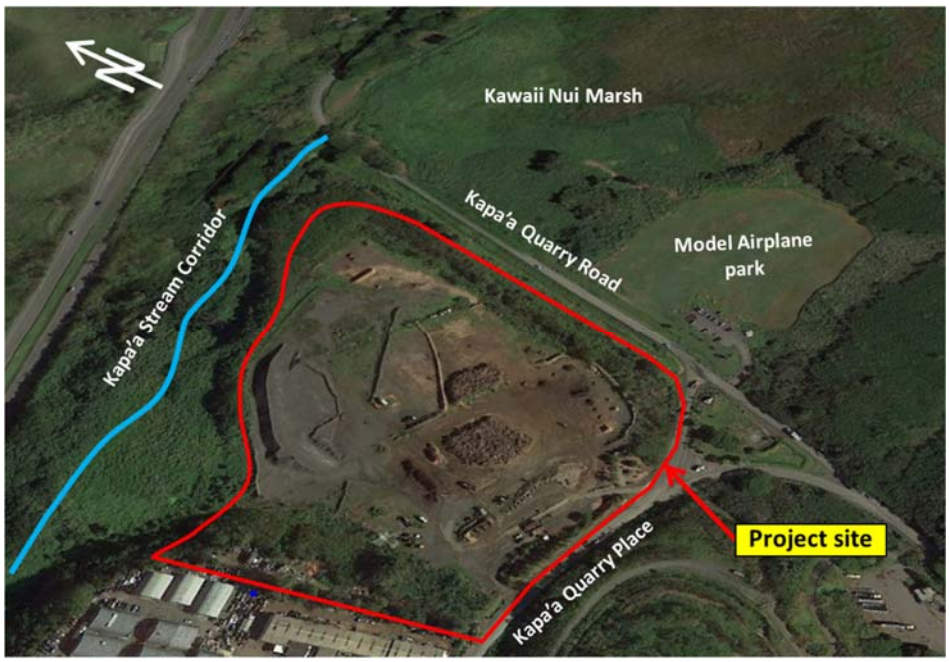


Figure 4.2: Project site and adjacent land use project site

The project site is within the lower portion of TMK 4-2-15:014

Figure 4.3: Portion of project site used for the development of warehouses, base yard and roadways

The grey area illustrates the 19-acre of impervious areas at the site with the remaining land inside the project site being vegetated area.

SECTION 5 - CONDITIONS OF THE EXISTING PROJECT SITE PERIMETER

This section describes the existing conditions of the site perimeter. The vegetated areas around the project site perform important impact mitigation function, such as shielding land adjacent from visual and light impacts, providing some level of storm water treatment and lowering noise and dust impacts.

The existing site perimeter will be improved and expanded during site development, in regard to geometry (e.g. height and width of earth berms) and type and density of plants.

The existing project site perimeter is made of several sections of vegetated areas with differing widths. Figure 5.1 shows five sections of the existing perimeter which have similar geometries and plant compositions. These five sections are described in the following:

A comprehensive photo presentation of the existing buffer zones at the site perimeter is shown in Appendix B.

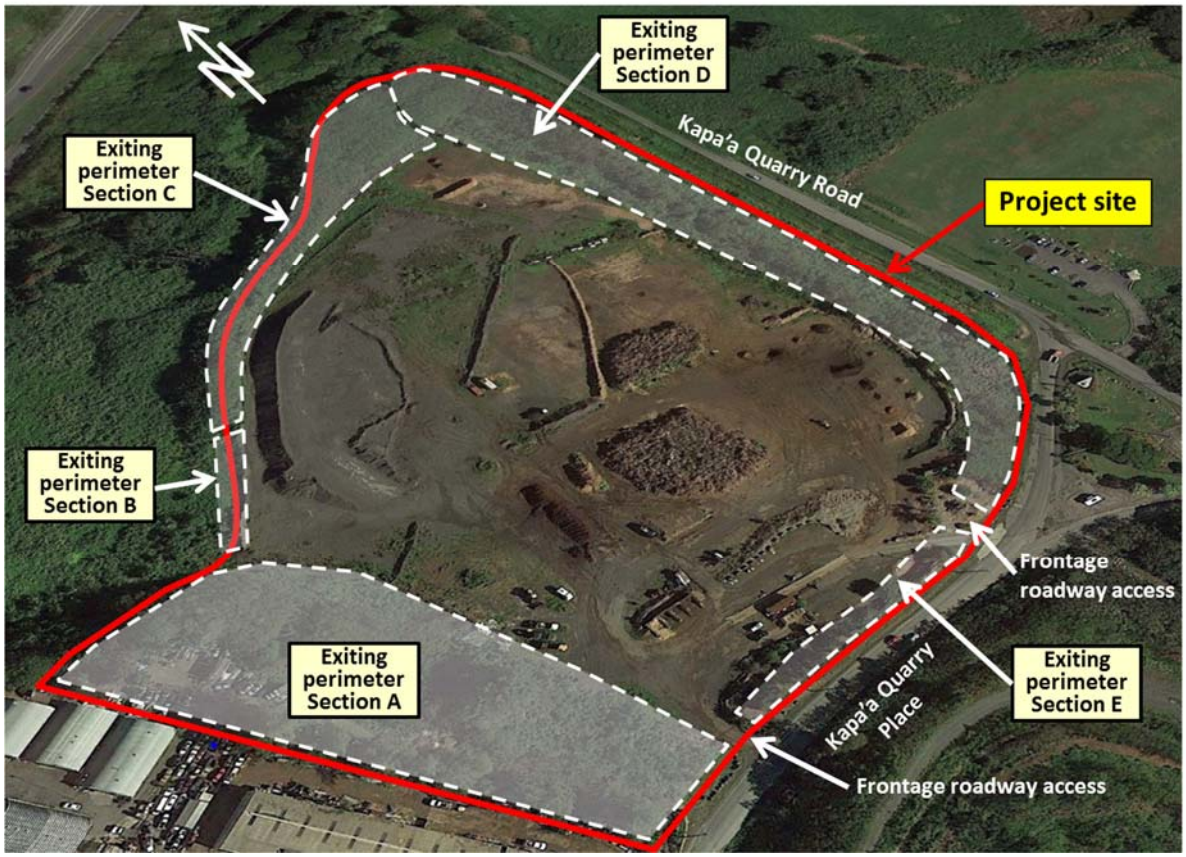


Figure 5.1: Location and extent of five sections of the existing site perimeter

Existing perimeter Section A:

Figure 5.2 shows the location of Section A of the existing site perimeter. Figure 5.3 describes Section A.

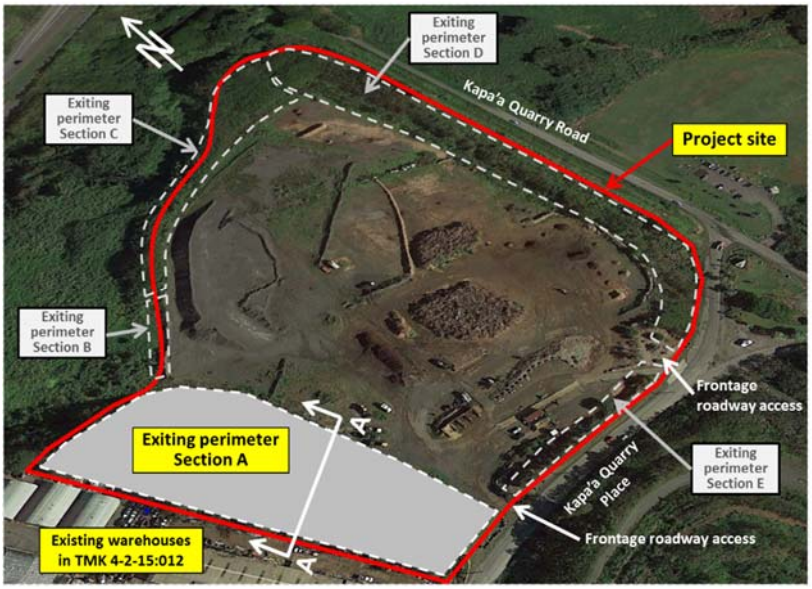


Figure 5.2: Location and extent of Section A of the existing site perimeter.

This section of the site perimeter separates the project site from the area in the South, which contains an existing warehouse development. The cross-section A-A is a typical section through this section of the site perimeter.

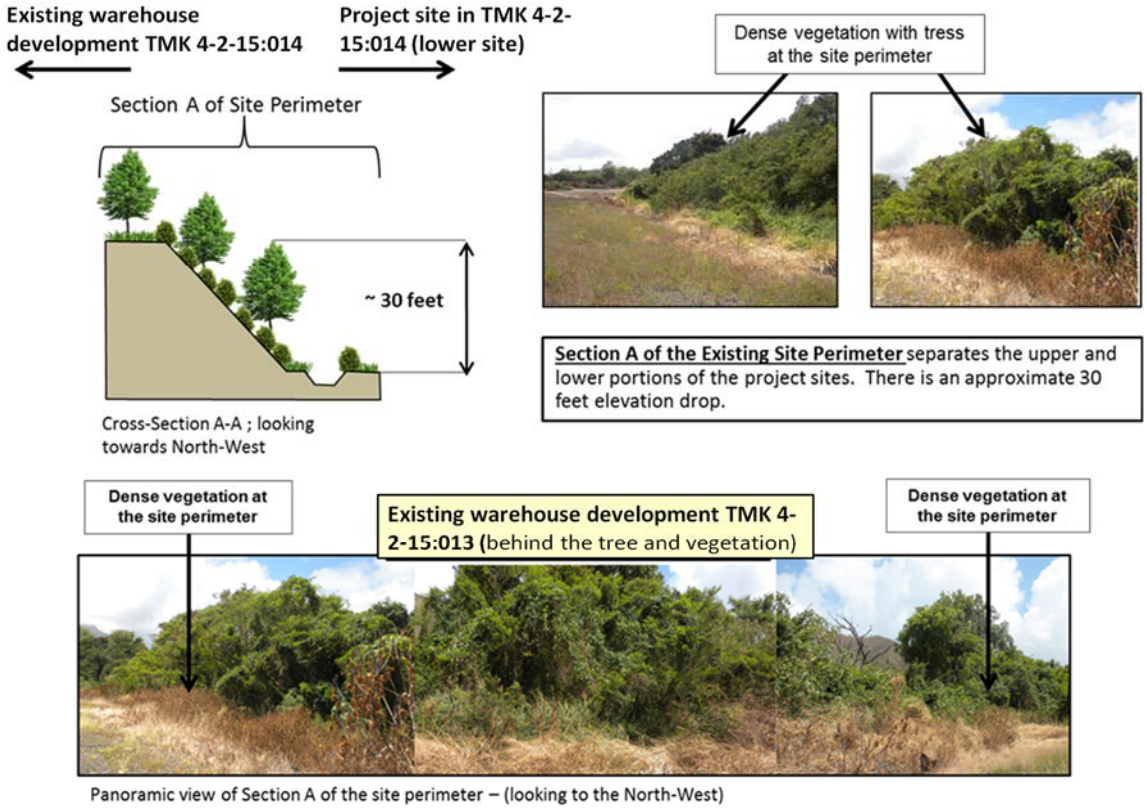


Figure 5.3: Description of Section A of the existing site perimeter

Existing perimeter Section B:

Figure 5.4 shows the location of Section B of the existing site perimeter. Figure 5.5 describes Section B.

Figure 5.4: Location and extent of Section B of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Stream corridor. This section of the site perimeter does not have an earth berm.
The cross-section B-B is a typical section through this section of the site perimeter.

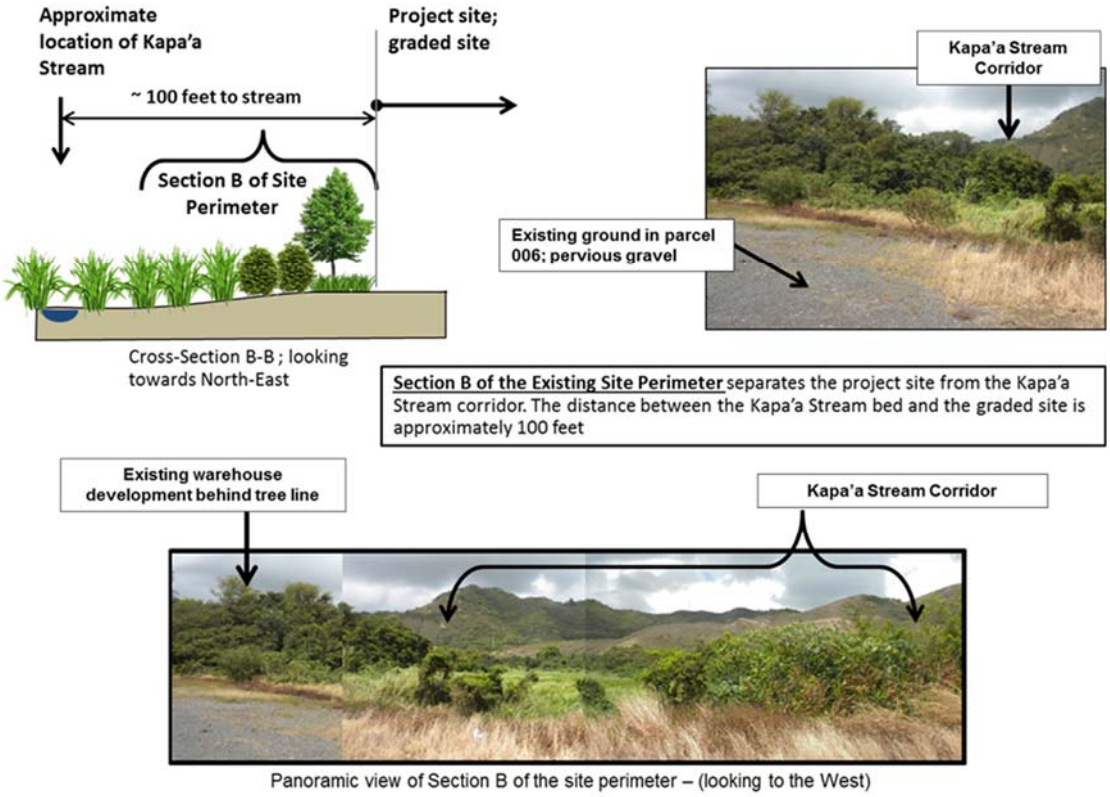


Figure 5.5: Description of Section B of the existing site perimeter

Existing perimeter Section C:

Figure 5.6 shows the location of Section C of the existing site perimeter. Figure 5.7 describes Section C.

Figure 5.6: Location and extent of Section C of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Stream corridor. This section of the site perimeter has earth berms that range from 3 to 5 feet in height. The cross-section C-C is a typical section through this section of the site perimeter.

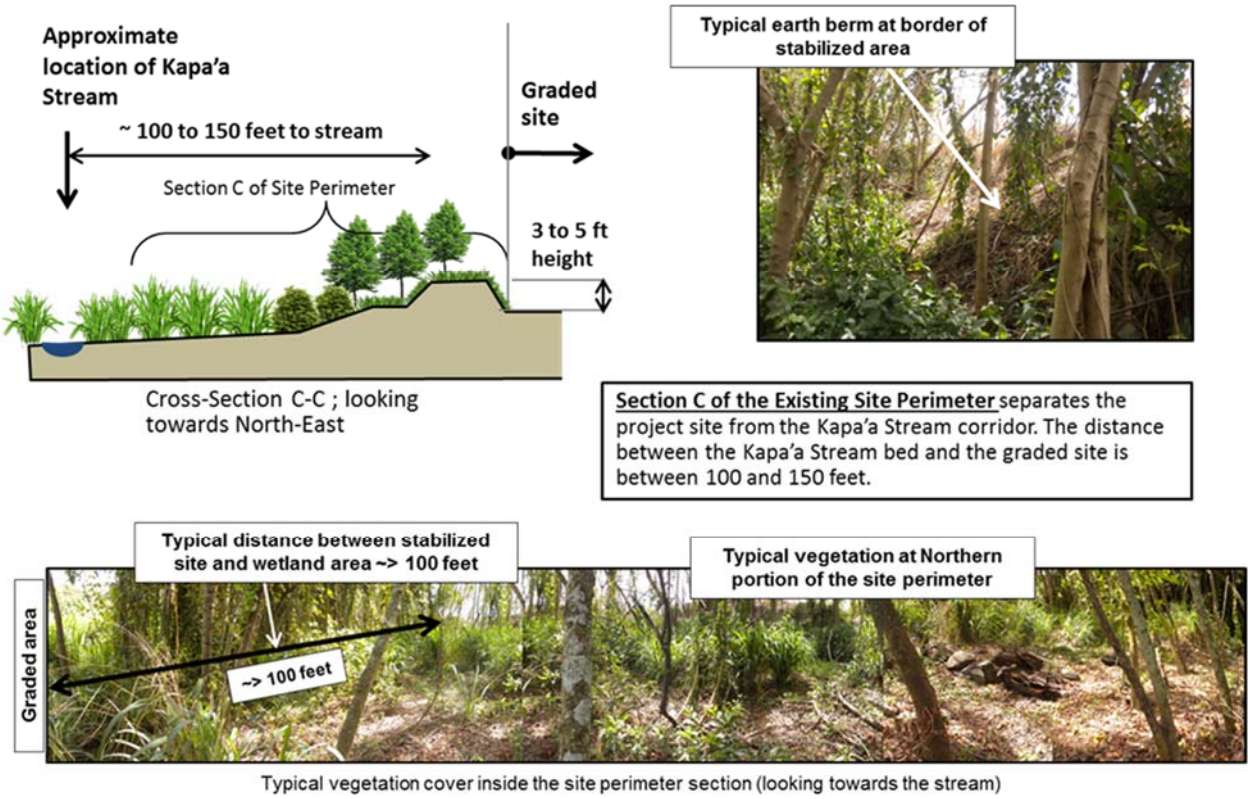


Figure 5.7: Description of Section C of the existing site perimeter

Existing perimeter Section D:

Figure 5.8 shows the location of Section D of the existing site perimeter. Figure 4.9 describes Section D.

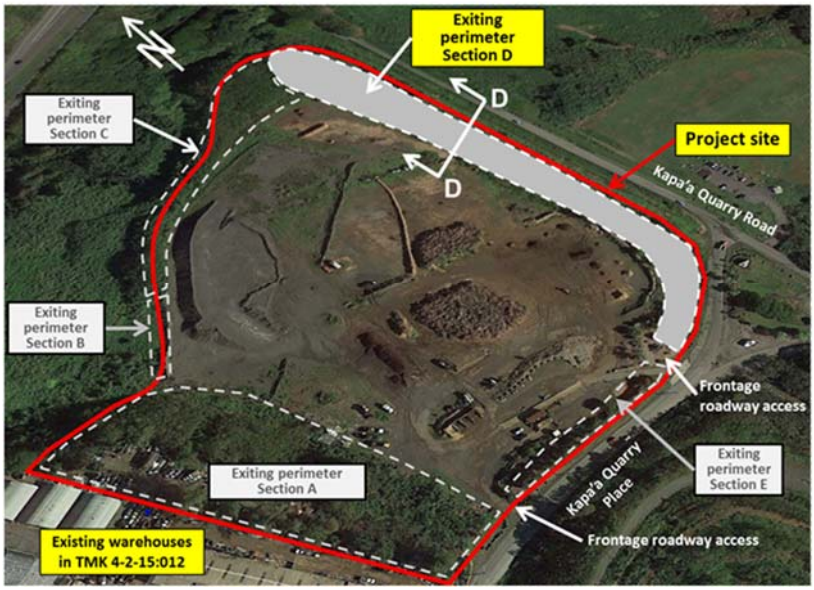


Figure 5.8: Location and extent of Section D of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Quarry Road and the Kawai Nui marsh. This section of the site perimeter has earth berms that range from 5 to 7 feet in height.
The cross-section D-D is a typical section through this section of the site perimeter.

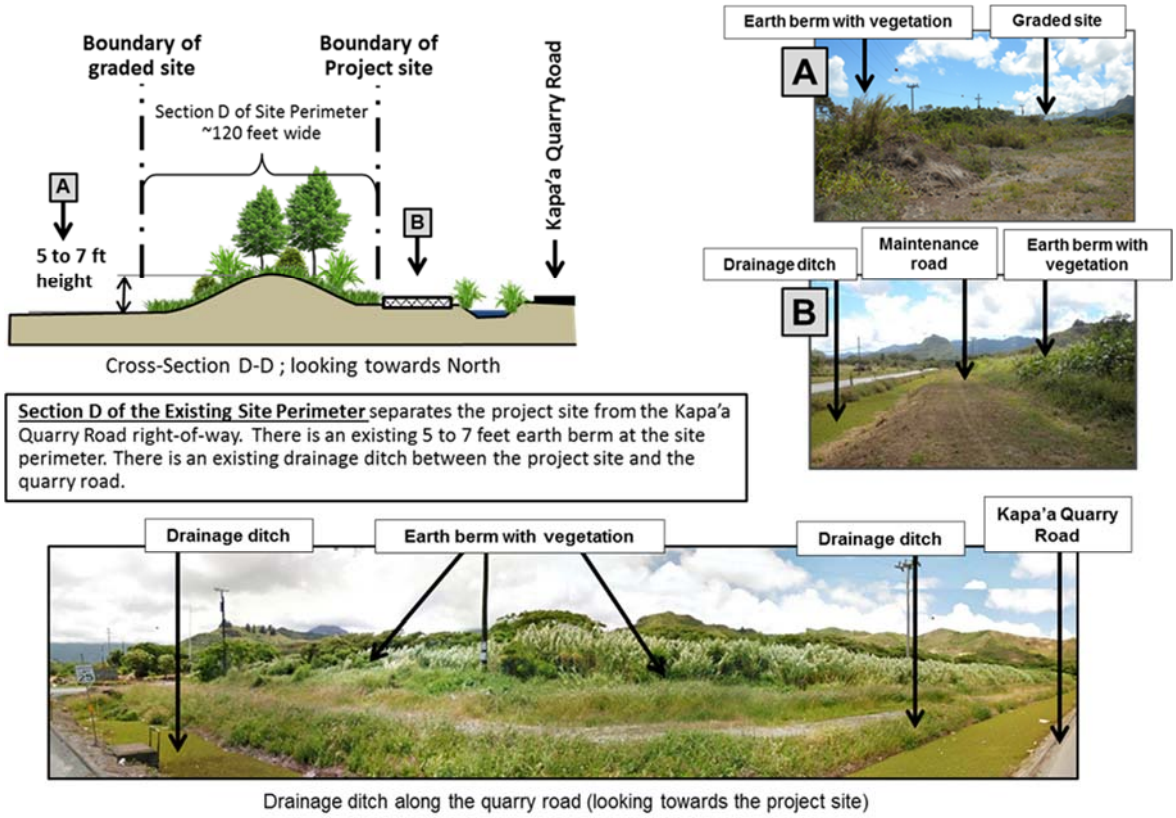


Figure 5.9: Description of Section D of the existing site perimeter

Existing perimeter Section E:

Figure 5.10 shows the location of Section E of the existing site perimeter. Figure 5.11 describes Section E.

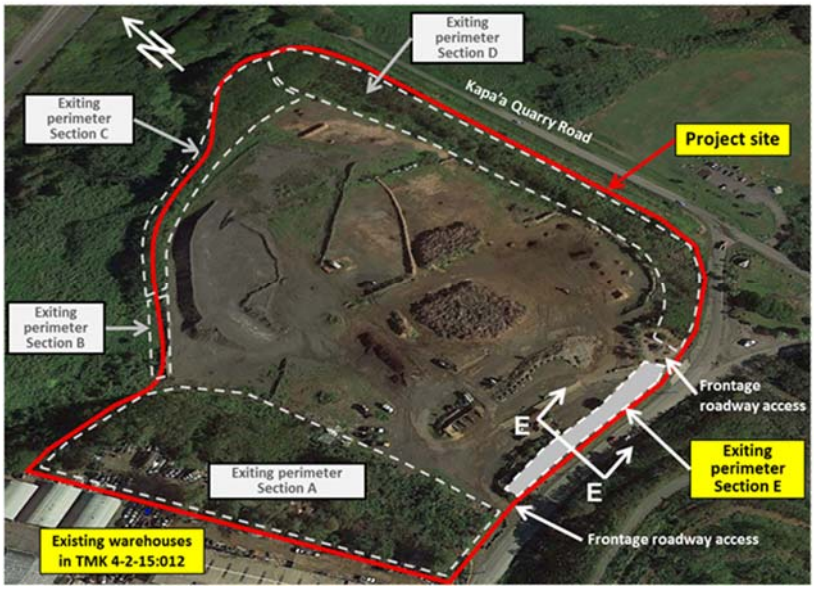
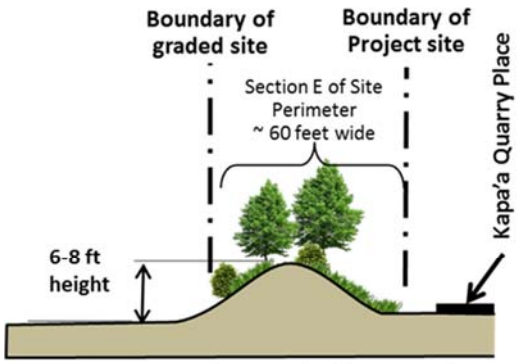


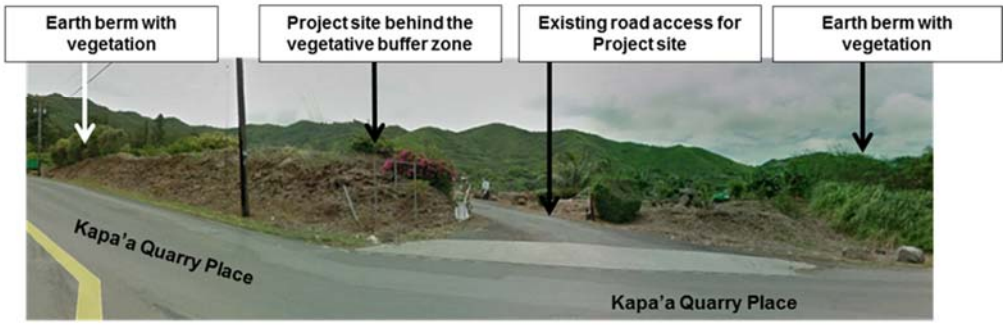
Figure 5.10: Location and extent of Section E of the existing site perimeter

This section of the site perimeter separates the project site from the Kapa'a Quarry Place roadway. This section of the site perimeter has earth berms that range from 6 to 8 feet in height.
The cross-section E-E is a typical section through this section of the site perimeter.



Cross-Section E-E ; looking towards East

Section E of the Existing Site Perimeter separates the project site from the Kapa'a Quarry Place right-of-way. There is an existing 6 to 8 feet high earth berm at the site perimeter.



Kapa'a Quarry Place at the Western frontage road access

Figure 5.11: Description of Section E of the existing site perimeter

SECTION 6 – REPRESENTATIVE CROSS SECTIONS OF THE BUFFER ZONE

The vegetation in the buffer zone at the site perimeter has several important impact mitigation functions, such as lowering impacts associated from visual, wind carried dust, storm water pollution and noise. The existing buffer zoned at the site perimeter is already performing some level of impact mitigation. The existing buffer zones at the at the site perimeter will augmented in terms of increasing width and height of berms and by adding appropriate plant species, preferably native and adapted species. Figure 6.1 illustrates the four cardinal direction perimeter sections of the project site. The typical geometry of the new buffer zone configurations within these four cardinal direction perimeter sections is similar. Table 6.1 describes the scope of buffer zone improvements relative to the existing buffer zone geometry.

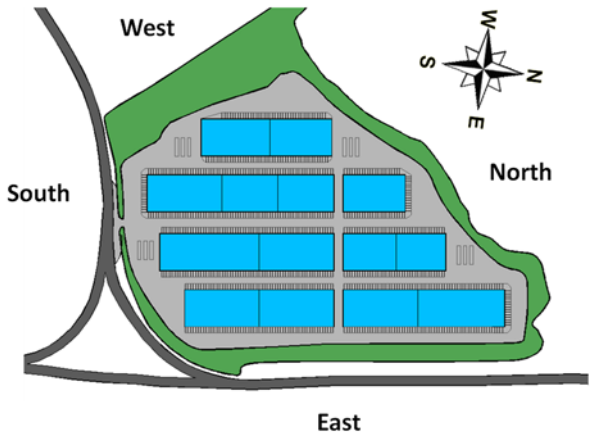


Figure 6.1: Description of cardinal direction perimeter sections of the project site

Buffer zone section	Scope of the buffer zone improvements in terms of geometry
West	The existing sloped area will be mostly be maintained in the present state. There will be limited cut and fill to minimize potential erosion exposure within small areas of too steep slopes. The existing large trees will be kept.
North	The new site perimeter will have larger heights and widths than the existing site perimeter berms. The height and width of the berms will be adjusted to obtain the desired geometry. There will be four outfall points for storm water that is released to the Kapa'a Stream corridor. The outfall structures will be integrated into the new earth berms.
East	The new site perimeter berms will be significantly increased in height and width. The new berms will receive a dense vegetation cover including larger trees. Trees and shrubs will provide essential visual impact mitigation.
South	A large portion of the existing site perimeter has an existing earth berm which will be removed. The new site perimeter will be modified to include a vegetated strip close to the Kapa'a Quarry Place roadway. The new site perimeter will be designed to ensure satisfactory sight distance for approaching traffic on the Kapa'a Quarry Place. There will be a single roadway access at the Southern site perimeter.

The existing and full build-out topography is depicted by means of a two horizontal (North-South) and two vertical (West – East) cross sections. Figure 6.2 defines locations of horizontal and vertical axes of these cross-sections, referred to as H-x and V-x, respectively.

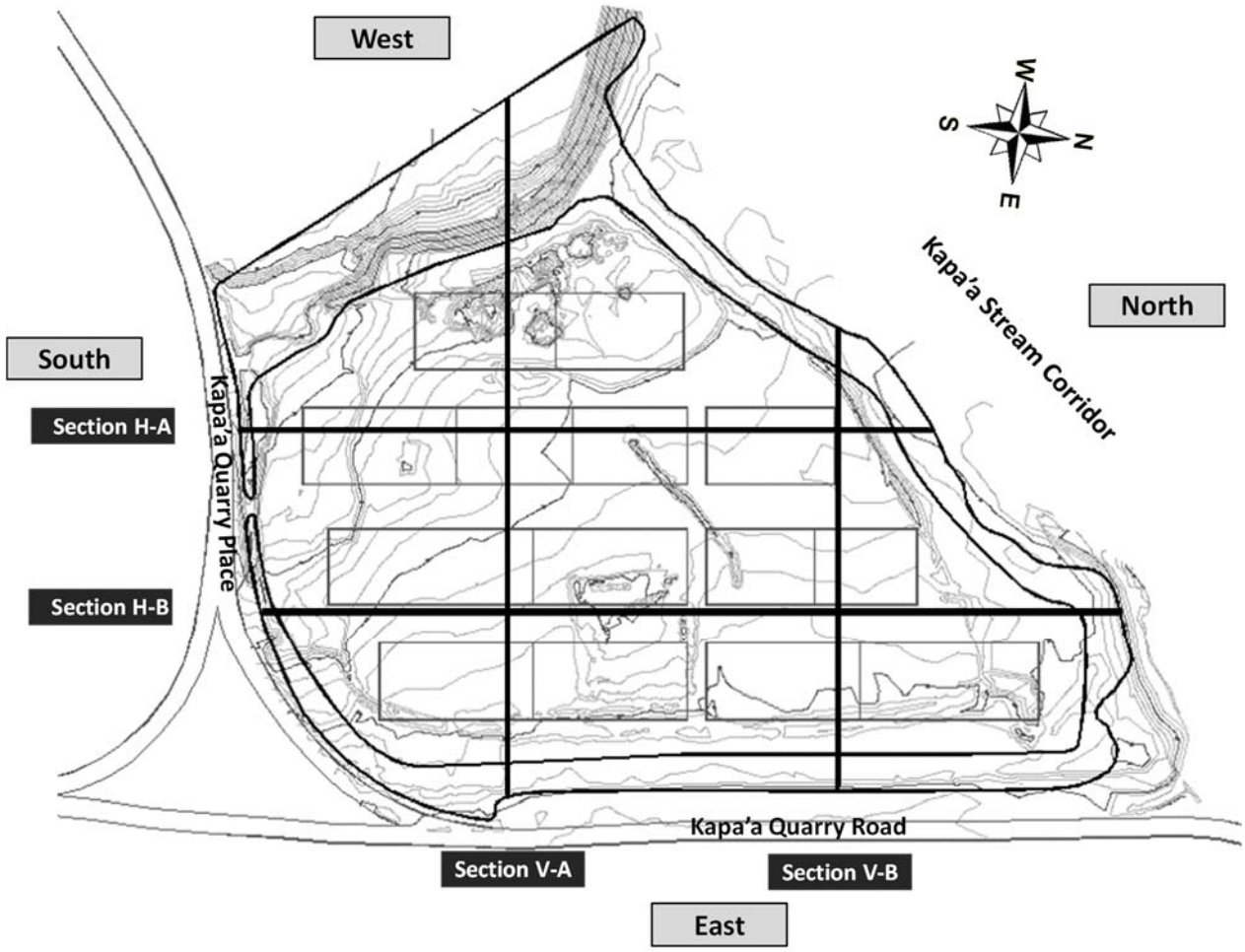


Figure 6.2: Definition of horizontal and vertical axes for representative cross-sections

Figures 6.3 through 6.21 show detailed descriptions of representative cross sections of the new buffer zone configurations. The representative cross-sections are depicted with existing and final grade (e.g. full build-out) conditions.

Representative cross-section along the V-B Section at the Eastern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.3. Figure 6.4 shows the representative cross section.

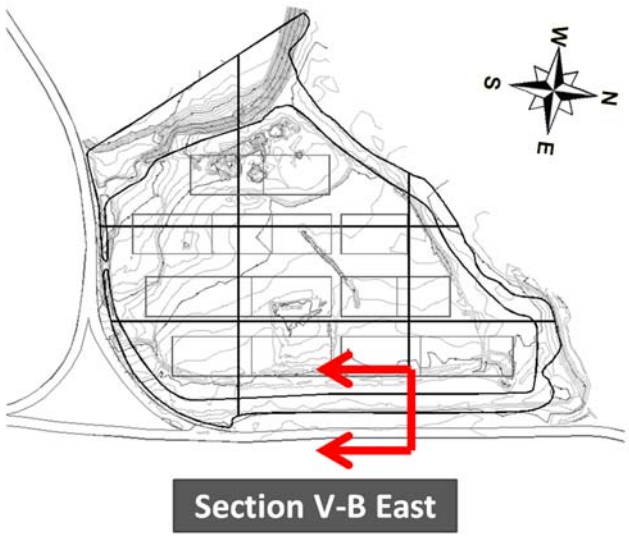


Figure 6.3: Representative cross-section for Section V-B East

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the South.

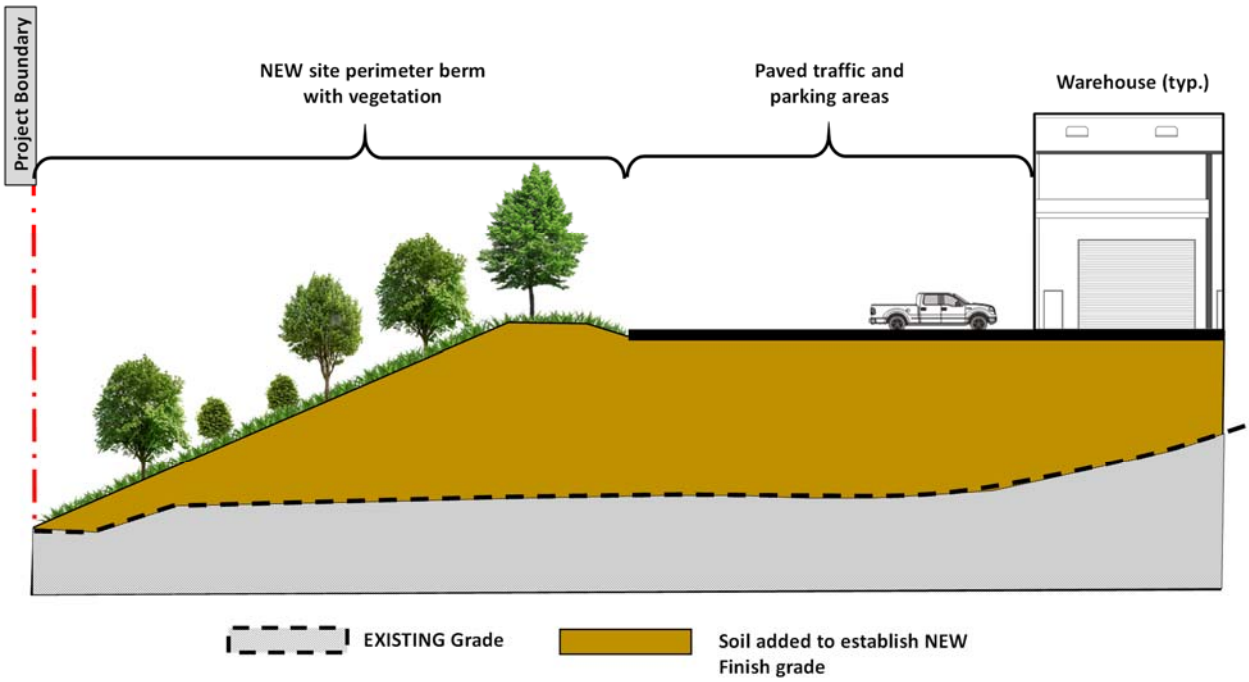


Figure 6.4: Representative cross-section for Section V-B East – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the V-A Section at the Eastern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.5. Figure 6.6 shows the representative cross section.

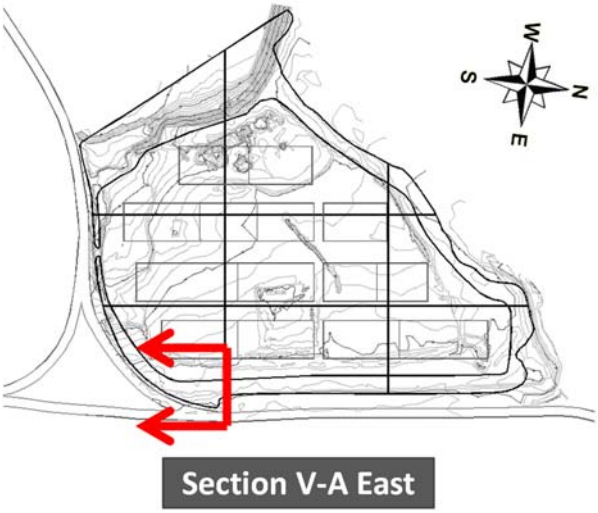


Figure 6.5: Representative cross-section for Section V-B East

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the South.

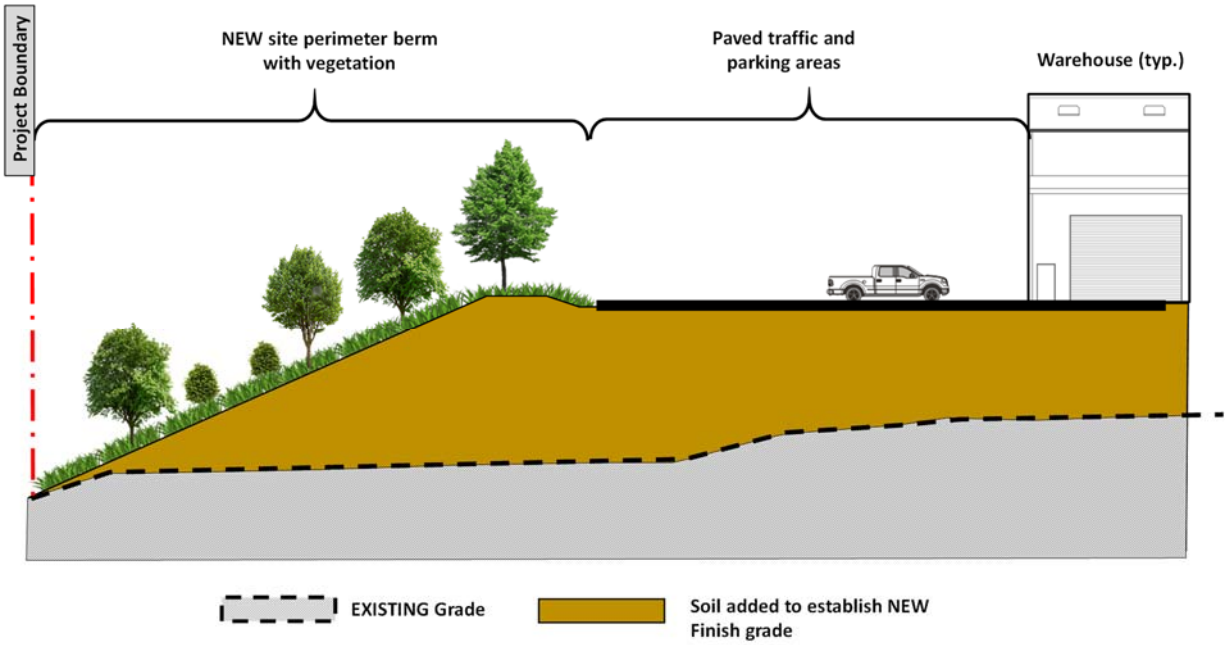


Figure 6.6: Representative cross-section for Section V-A East – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the H-A Section at the Southern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.7. Figure 6.8 shows the representative cross section.

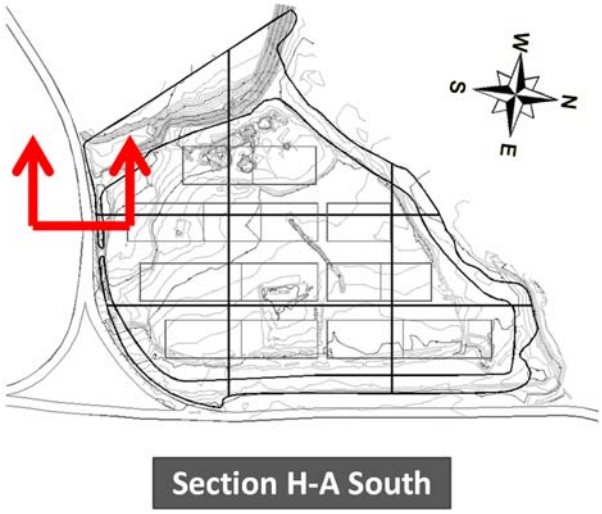


Figure 6.7: Representative cross-section for Section H-A South

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the West.

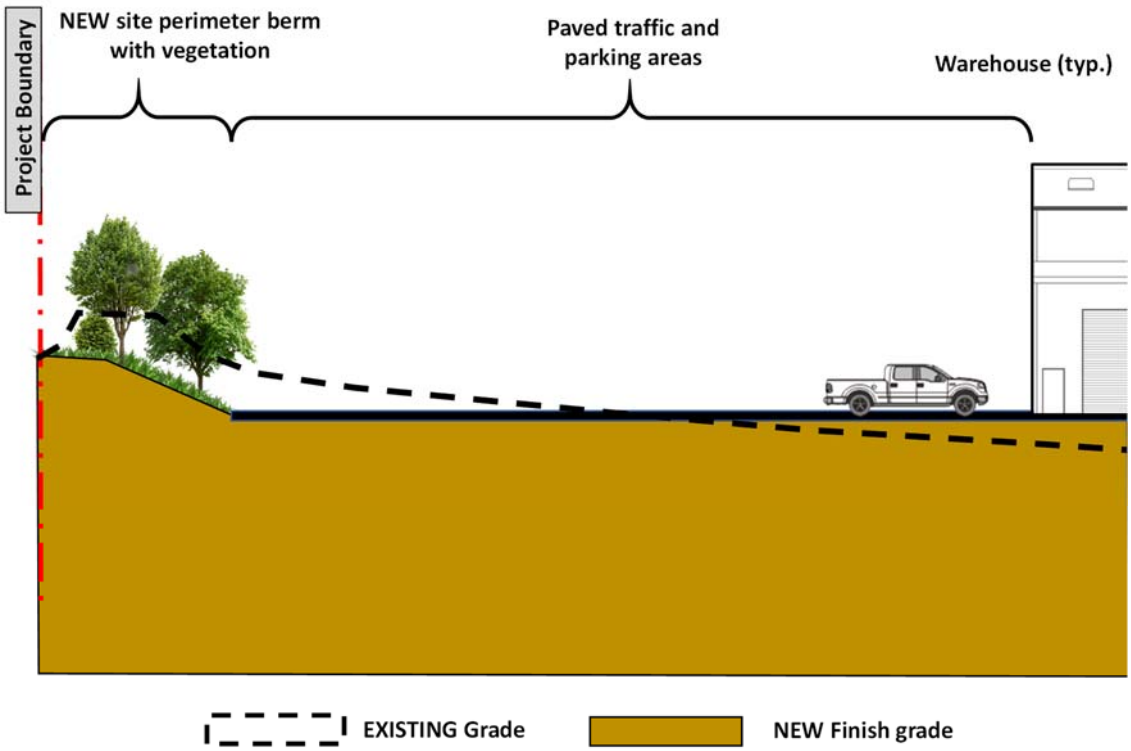


Figure 6.8: Representative cross-section for Section H-A South– showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the H-B Section at the Southern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.9. Figure 6.10 shows the representative cross section.

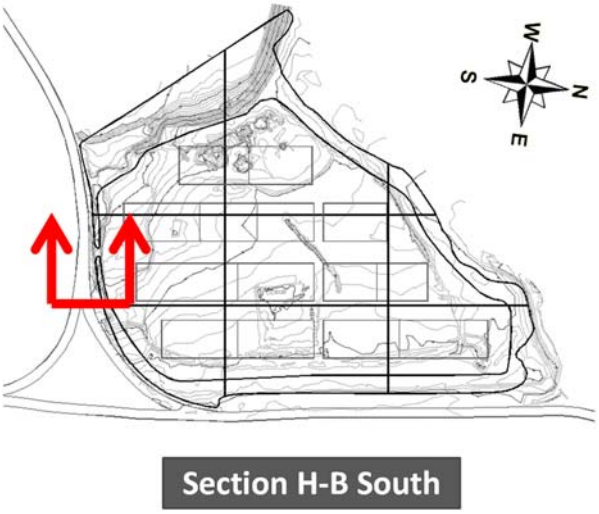


Figure 6.9: Representative cross-section for Section H-B South

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the West.

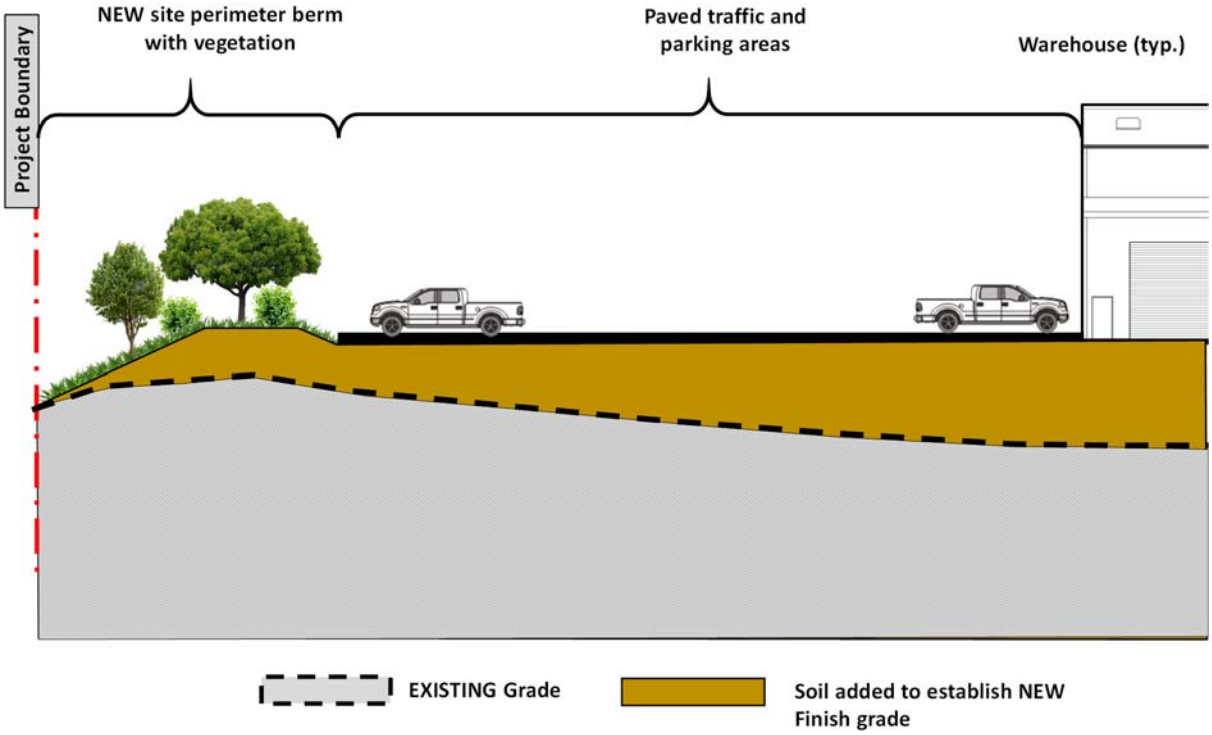


Figure 6.10: Representative cross-section for Section H-B South– showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the V-A Section at the Western site perimeter:

The location and direction of the Cross section is depicted in Figure 6.11. Figure 6.12 shows the representative cross section.

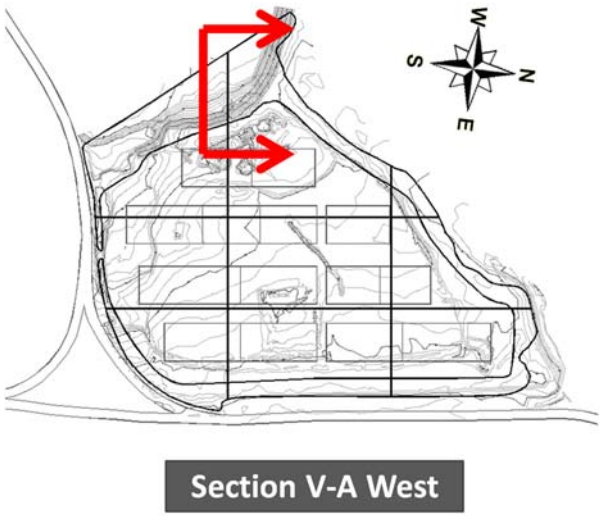


Figure 6.11: Representative cross-section for Section V-A West

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the North.

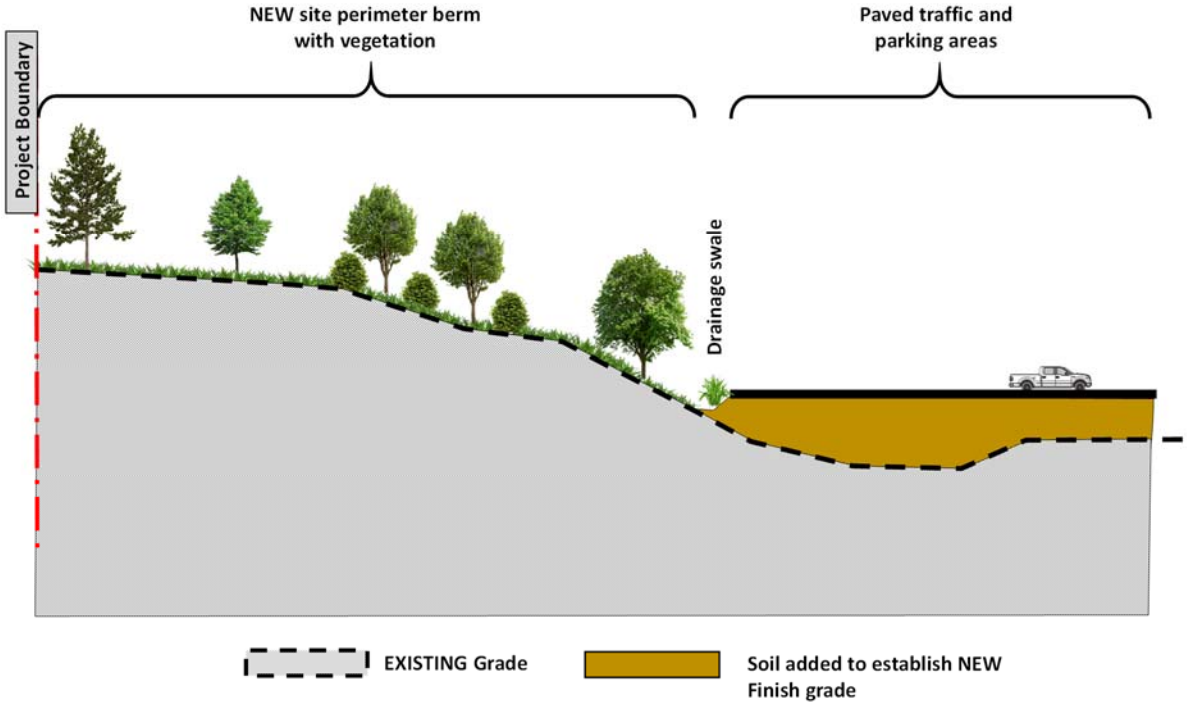


Figure 6.12: Representative cross-section for Section V-A West – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the V-B Section at the Western site perimeter:

The location and direction of the Cross section is depicted in Figure 6.13. Figure 6.14 shows the representative cross section.

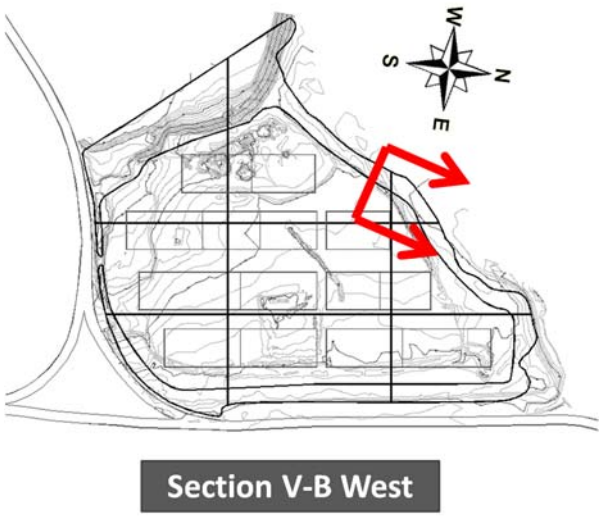


Figure 6.13: Representative cross-section for Section V-B West

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the North.

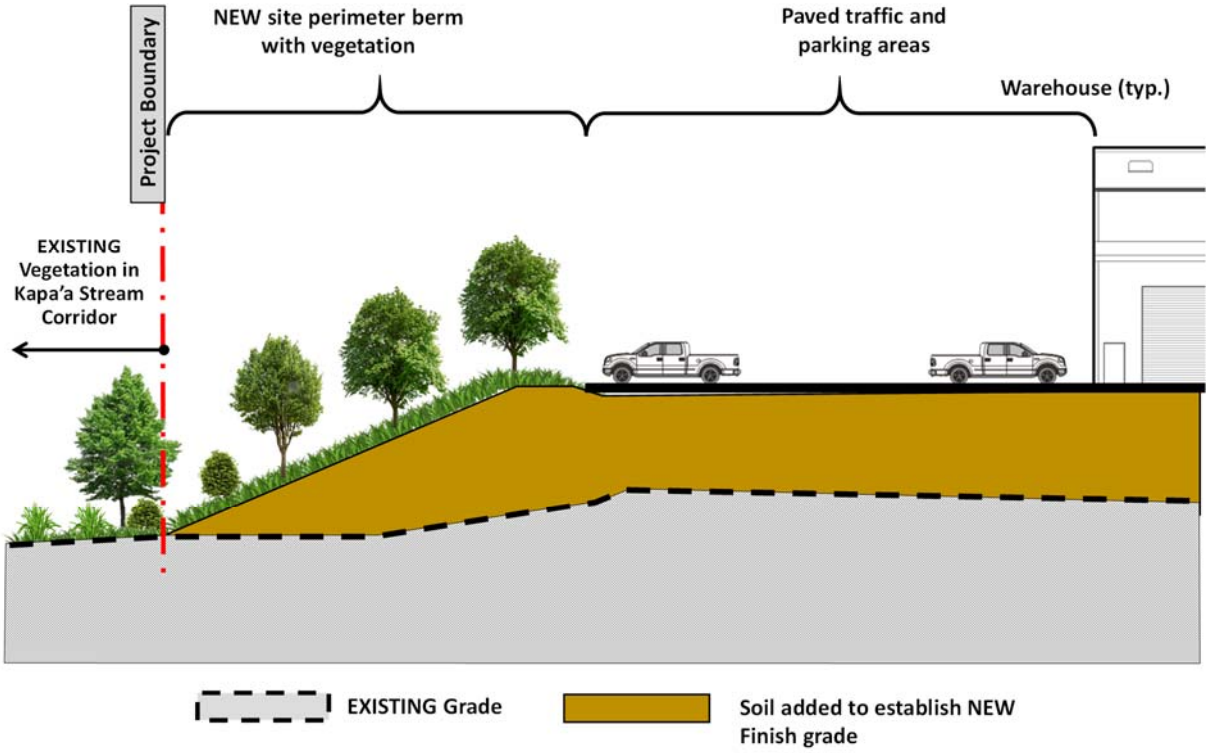


Figure 6.14: Representative cross-section for Section V-B West – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the H-A Section at the Northern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.15. Figure 6.16 shows the representative cross section.

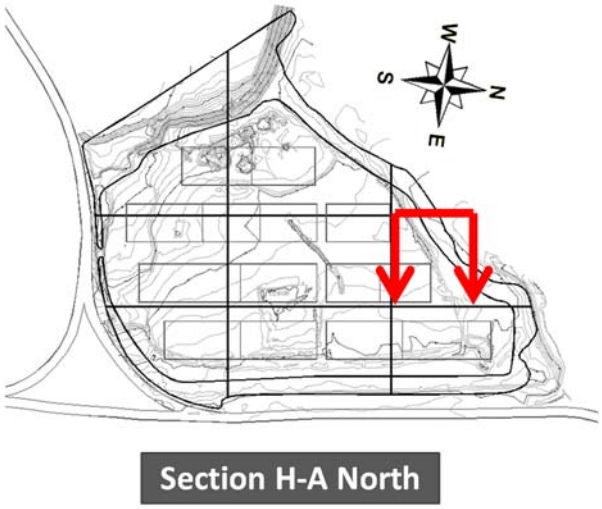


Figure 6.15: Representative cross-section for Section H-A North

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the East

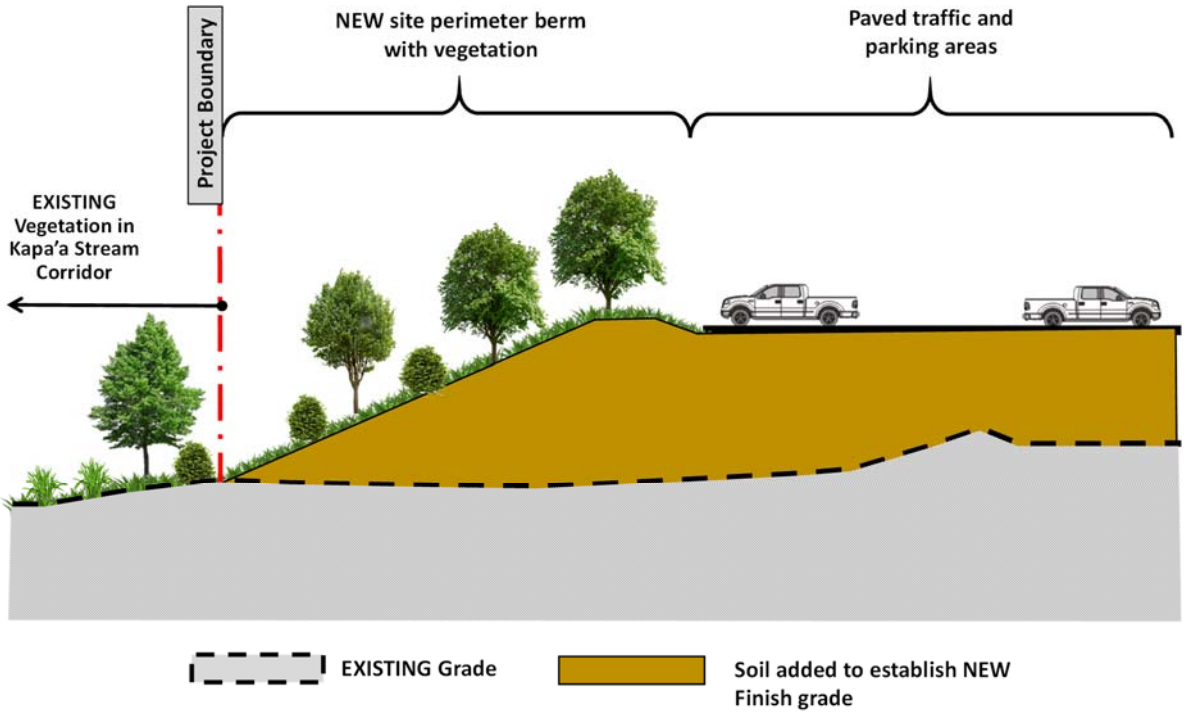


Figure 6.16: Representative cross-section for Section H-A North – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

Representative cross-section along the H-B Section at the Northern site perimeter:

The location and direction of the Cross section is depicted in Figure 6.17. Figure 6.18 shows the representative cross section.

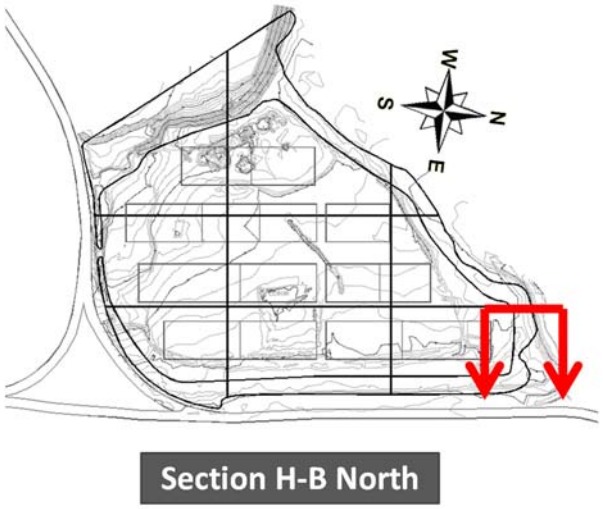


Figure 6.17: Representative cross-section for Section H-B North

The section extends through the new site perimeter berm, starting from the project site boundary to a distance inside the site.

The view is to the East

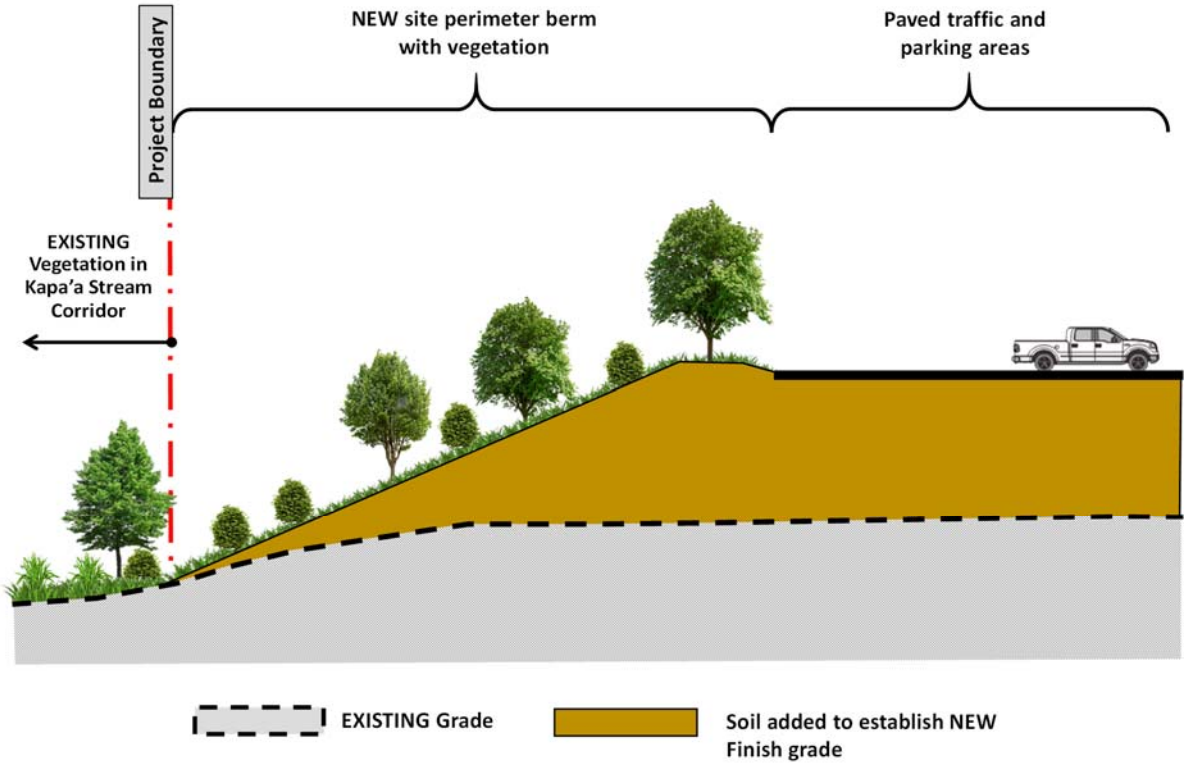


Figure 6.18: Representative cross-section for Section H-A North – showing existing and finish grade. The amount of fill that will be added is indicated in the brown shading. The horizontal to vertical scale ration is 1.5 to 1.

The storm water treatment and management systems of the Lower site will release treated stormwater runoff and peak flow runoff to the Kapa'a Stream corridor. Figure 6.19 shows a site layout which indicates the four drain outlets 1 through 4

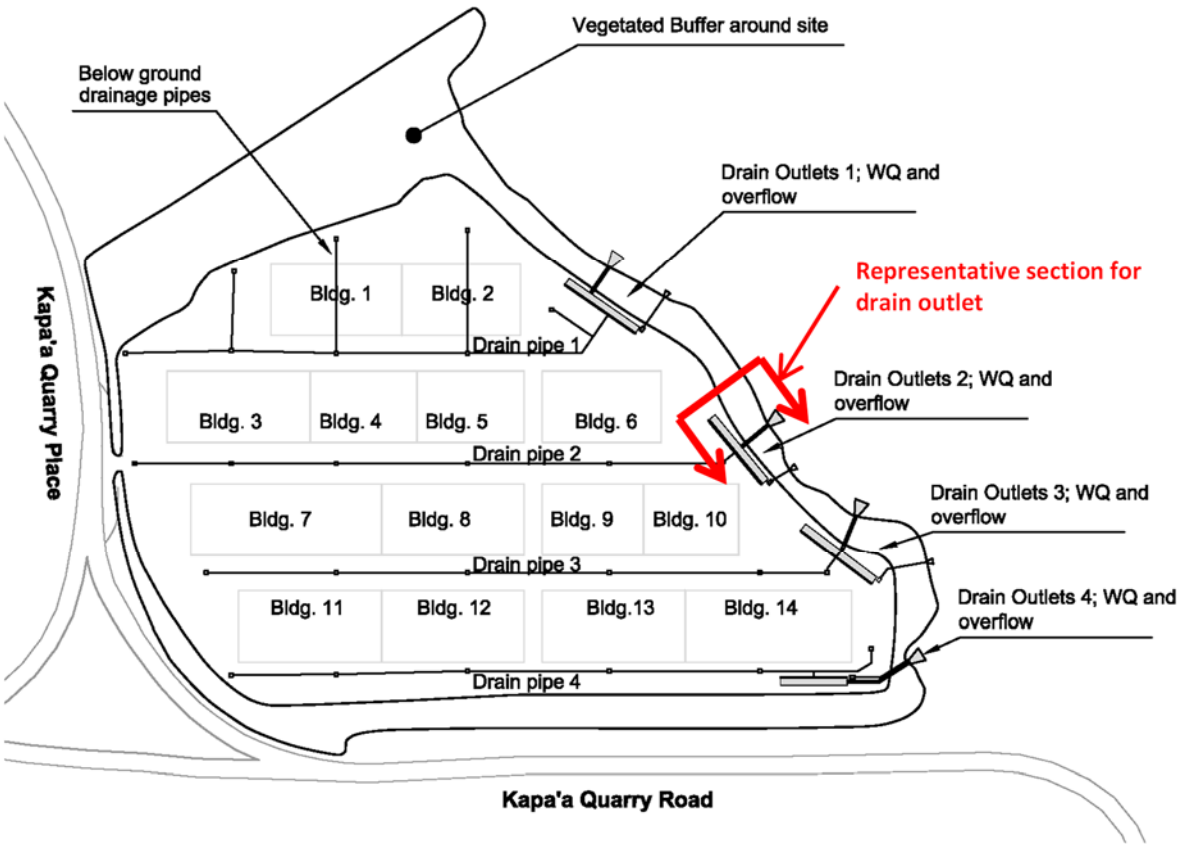


Figure 6.19: Storm water system for the Lower site and the location of drain outlets which discharges the storm water to the Kapa'a Stream corridor – Location of the representative cross section for the drain outlets is indicated in red

Each drain outlet has two types of outfalls structures:

(1) The First type of outfall structure discharges the <u>water quality (WQ) flow</u> to the Kapa'a Stream corridor. The WQ outlet has typically low water flow rates. The WQ water flow will come from the Manufactured Treatment Device (MTD) unit which filters storm water before it is discharged. The MTD unit receives water from the detention vaults. Storm water runoff will be captured and detained in underground detention vaults and the released slowly over a period of 24 to 48 hours. This slow release from the detention avoids high discharge flow rates which would occur without the temporary detention of runoff. The outlet itself will be a riprapped section on the lower portion of the perimeter berm. With the low flow rates there would be no problems with scouring in the areas downstream of the outlet. Figure 6.20 illustrates the <u>generic design concept of the WQ outfall structure</u>. All four drain outlets will have the same design concept.

(2) The Second type of outfall structure will discharge peak storm water runoff that bypasses the detention vaults during stronger rain events. When the runoff volume from a drainage areas in

the Lower site surpasses the storage volume of the detention vaults, storm water runoff will bypass the detention vault. The water bypassing the detention vaults will be discharged to the stream corridor without flowing through the MTD unit. This type of storm water runoff discharge will have higher flow rates than the WQ discharge. Therefore, the design of the outfall structure will include measures to convey higher flow rates though pipes, dissipate flow energy, avoid scouring or soil and evenly distribute the water in the steam corridor.

Figure 6.21 illustrates the generic design concept for the higher flow rate discharge. The overflow bypassing the detention vaults will enter an overflow structure which connects to a larger drainage pipe. The drainage pipe terminates in an energy dissipation chamber. Downstream of the energy dissipation an armored spill way will convey the flow down the perimeter berm to a stilling basin at the foot of the new site perimeter berm. Downstream of the stilling basin water will be distributed to the stream corridor. This configuration ensures good impact mitigation against possible stream bed erosion.

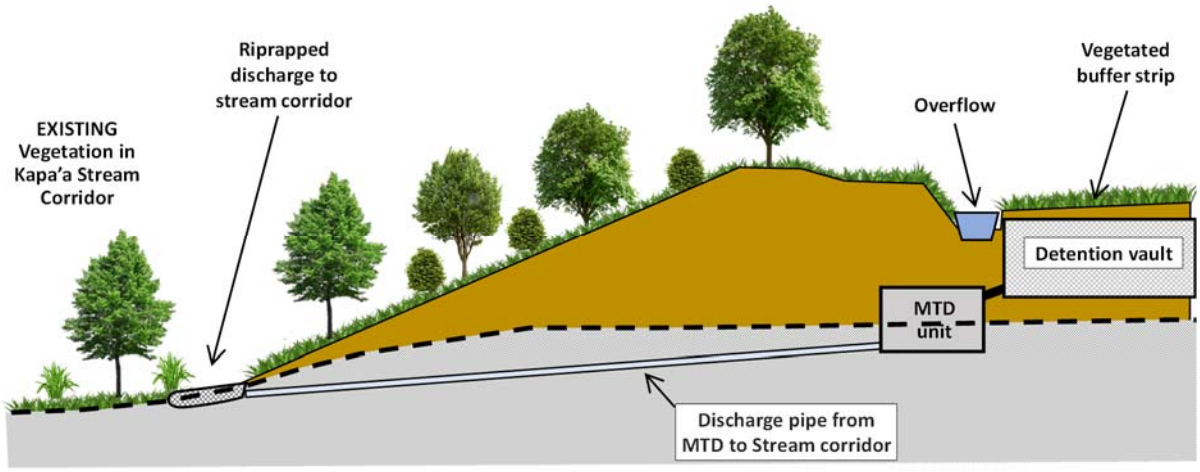


Figure 6.20: Representative cross section through drain outlet – WQ flow outfall structure is indicated

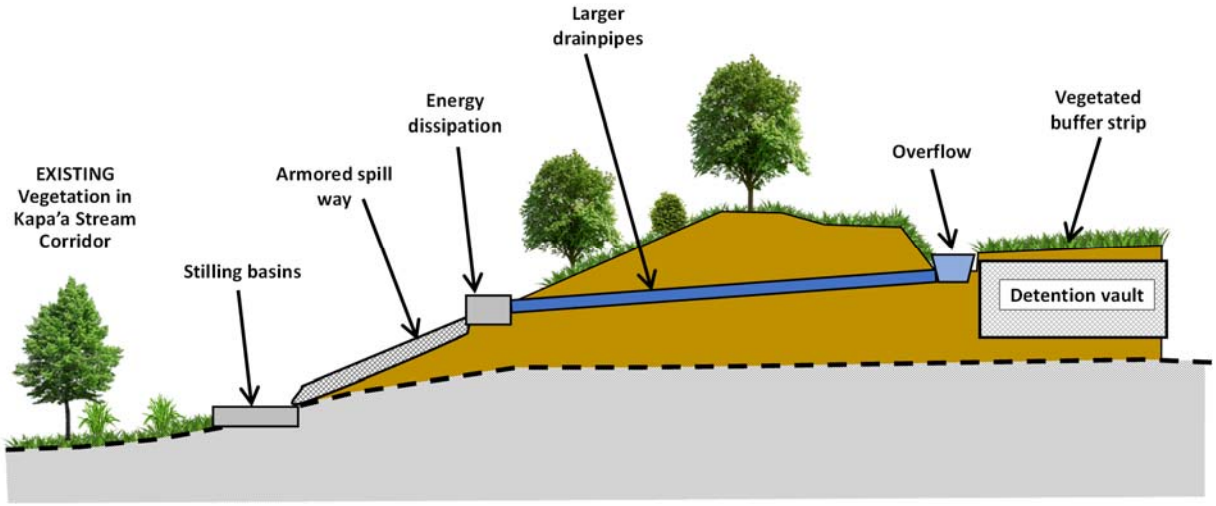


Figure 6.21: Representative cross section through drain outlet – Peak flow outfall structure is indicated

SECTION 7 - PROPOSED DEVELOPMENT OF THE BUFFER ZONE - CANDIDATE PLANTS

The intent of improving the vegetation in the newly developed buffer zones is to curb population of invasive plant species and finally establish native and adapted plants species. At the present the buffer zone is not managed, and the existing vegetation is the result of naturally occurring mostly invasive and particularly invasive alien plant species.

The new buffer zones will have newly constructed earth berms with a new and managed vegetation population. The new vegetation will feature mostly native and adaptive Hawaiian plant species. In this context a plant is considered native if it arrived in Hawaii without the assistance of man. Plants that are native to Hawaii may also occur elsewhere—a native plant is considered indigenous if it is found in other places as well. Some native plants, however, are endemic—they occur naturally only in the Hawaiian Islands. Adapted plants are not native and not invasive, but are able to thrive in the local climate and soil conditions.

The following describes candidate trees and plants for the buffer zone development. The list of candidate plants may be amended, depending on actual soil conditions of the new berms in the different sections of the buffer zone. Additionally, the landscape company may decide to include other plant species in the final plant selection, while considering soil and other prevailing conditions.

Table 7.1 includes plant species proposed in the original 2016 conceptual pan of the buffer zone development. Trees and shrubs recommended by DLNR have been added to the original 2016 list . Furthermore, the list does no longer includes several trees species which were in the 2016 list, but were recommended by DLNR not to use in the final development plan.

Table 7.1: Candidate trees, shrubs and groundcover, preferably for FIRST phase of new buffer zone development.

Type of plant	Name of Plant and brief description	Image
Tree	**Acacia koaia (Koaia)** is native to Hawaii. The tree grows to about 30 ft. in height with trunks less than 2 ft. in diameter. Pods are narrow and linear. Twigs are slender, light brown and smooth. Bark is rough and corrugated. Wood is harder than the giant Koa. Best growth conditions are in drier climate and open sunlight below 3,000 ft. in elevation. Koaia is becoming rare and listed as a Federal Species of Concern.	

Table 7.1: Candidate trees, shrubs and groundcover, preferably for FIRST phase of new buffer zone development.

Type of plant	Name of Plant and brief description	Image
Tree recommended by DLNR	Official State Tree of Hawaii: **Aleurites Moluccana** (Kukui): The kukui tree, a member of the spurge family, kukui became the State Tree of Hawaii in 1959, embodying in its varied use and intrinsic beauty a sense of serenity, protection, and calm. The kukui is also called the candlenut tree because the nut of the kukui was used for candles by early settlers. The kukui tree is not native to Hawaii and was introduced from Polynesia. All parts of the kukui tree are toxic, but toxicity harbors medicine and the Hawaiians understood this deeply. The kukui tree grows to a height of up to 90 ft, with wide spreading or pendulous branches. The leaves are pale green, simple, and ovate or heart-shaped on mature shoots, but may be three-, five-, or seven-lobed on saplings.	
Tree recommended by DLNR	**Thespesia populnea (Milo):** Milo is a member of the large Malvaceae (Mallow) family that includes about 100 genera and more than 2,000 species including abutilon, cotton and hibiscus. It is a very close relative of another Hawaiian heritage plant the hau tree. Hibiscus tiliaceus has similar leaves and flowers but differs slightly in its growth habit. Both trees are well suited to coastal locations with slightly alkaline soil that drains well. Milo trees grow throughout the Pacific islands and are prolific seed producers. An ideal specimen plant for gardens at lower elevations, milo trees often remain shorter than 20 feet tall and have lovely dark green, heart-shaped leaves with lighter colored veins. Their attractive yellow flowers resemble hibiscus flowers in shape.	

Table 7.1: Candidate trees, shrubs and groundcover, preferably for FIRST phase of new buffer zone development.

Type of plant	Name of Plant and brief description	Image
Tree	**Metrosideros polymorpha (Ohia):** A native tree to Hawaii that grows quite tall. This tree has a broad range of growing tolerance from near sea level to higher elevation. The Ohia is the most abundant tree in the Hawaiian forest. Ohia is able to incur heavy pruning and is capable of growing in rocky locations, even in lava fields. The red flowered Ohia is most prevalent, but colors can range from red to salmon to yellow. This tree would be a very attractive addition to buffer zones.	
Tree <u>recommended by DLNR</u>	**Alibizia Saman (Monkeypod tree):** The Monkeypod tree is also known as saman and rain tree and has the Hawaiian name ōhai. This plant was purposefully introduced to Hawaii in 1847. The monkeypod tree has been used for woodworking for a longtime because it is a light wood that is very resistant to decay and also resistant to termites. The tree has nutritious pods which cattle, hogs and goats eat. The tree is mainly preferred for the beauty and the amount of shade it provides and is used to line many streets in Hawaii. However, the tree drops sticky pods and flowers on cars that are parked beneath. The tree can become top heavy and have huge branches falling. The tree can attain 45 to 60 feet in height, with a relatively small trunk between 1 to 3 feet in diameter. The branches of the tree grow mostly horizontally, making the tree a huge 40 to 60 feet across with a large symmetrical gown shape to the tree top. It has brush like flowers and also fruits (pods) that look like beans.	
Tree <u>recommended by DLNR</u>	Cordia subcordata (Kuo): While Kou was originally thought to have been introduced from Polynesian it is now categorized as an indigenous to the Hawaiian Islands. Kou is an excellent tree for a roomy landscape. They can get to be medium-large trees and may not be suitable for small urban yards that cannot accommodate a height and canopy spread of 25-35 feet. The tree has a shallow root system and	

Table 7.1: Candidate trees, shrubs and groundcover, preferably for FIRST phase of new buffer zone development.

Type of plant	Name of Plant and brief description	Image
	can be damaged by too much surface disturbance. Once established they require little maintenance.	
Tree	Podocarpus: This tree attains a height of over 60 ft. The crown is quite dense, and it provides shade cover at the base of the tree. This evergreen tree can grow in various types of soil. It requires full sunlight and can be used for reforestation and windbreak. This tree was introduced specifically for reforestation.	
Tree	**Tristania conferta (Brush Box):** This tree can be used as an outside row tree in a multiple row windbreak, or alone in a multiple row windbreak. This tree normally grows to 60 ft. in height but can reach and even exceed heights of 80 feet. The tree was introduced from Australia and is drought tolerant. It is a hardy low-branching, dense tree related to Eucalyptus. It can tolerate heavy and repeated pruning thus making the foliage denser and well suited for a windbreak or ornamental tree.	
Shrub and Groundcover <u>recommended by DLNR</u>	**Scaevola taccada, beach naupaka:** While mostly found in coastal locations this hardy shrub is also used for landscaping. In fact, the shrub is used so often that many landscapers do not think of it as a native plant.	
Shrub and Groundcover	**Osteomeles anthyllidifolia, 'ülei**, this shrub is indigenous to Hawai'i. The plant can be found in a wide variety of habitats. The sprawling shrub with flexible branches can eventually develop into a large shrub up to 10 feet tall.	

Table 7.1: Candidate trees, shrubs and groundcover, preferably for FIRST phase of new buffer zone development.

Type of plant	Name of Plant and brief description	Image
Groundcover	**Wikstroemia uva-ursi, 'äkia,** is often used as a landscape plant. It should be maintained as a low groundcover to be attractive.	

SECTION 8 - PHASING OF BUFFER ZONE DEVELOPMENT

The development of the site will be done in three major construction phases. As the development work progresses, impacts from construction, such as visual impacts, impacts from storm water runoff and dust and noise impacts, are mitigated by the presence of existing and improved (e.g. full build-out) buffer zones. Different portions of existing and improved buffer zones will be present in the development phases. The three site development phases are depicted in Figures 8.1 through 8.3.

Project Development Phase 1: Figure 8.1 shows the extent of the site development for Phase 1. The new sections of the buffer zone are shown in green shade. The four buildings which are located next to the Eastern site perimeter will be the first structures to be constructed. The roof areas of these four buildings and the adjacent paved traffic and parking areas will be drained by two drainpipes. Each of the two drainpipes terminate in the storm water treatment facilities, which have their own drain outlets, Drain Outlet 3 and 4. Figure 8.1 indicates the length of the buffer zone development around the site. The buffer zones will be developed on the new site perimeter berms. Trees and shrubs will be planted on the perimeter berms. The vegetation on the berms and the geometry of the berms will combine to provide visual impact mitigation from the adjacent roadway of the Kapa'a Quarry Road and Kapa'a Quarry Place.

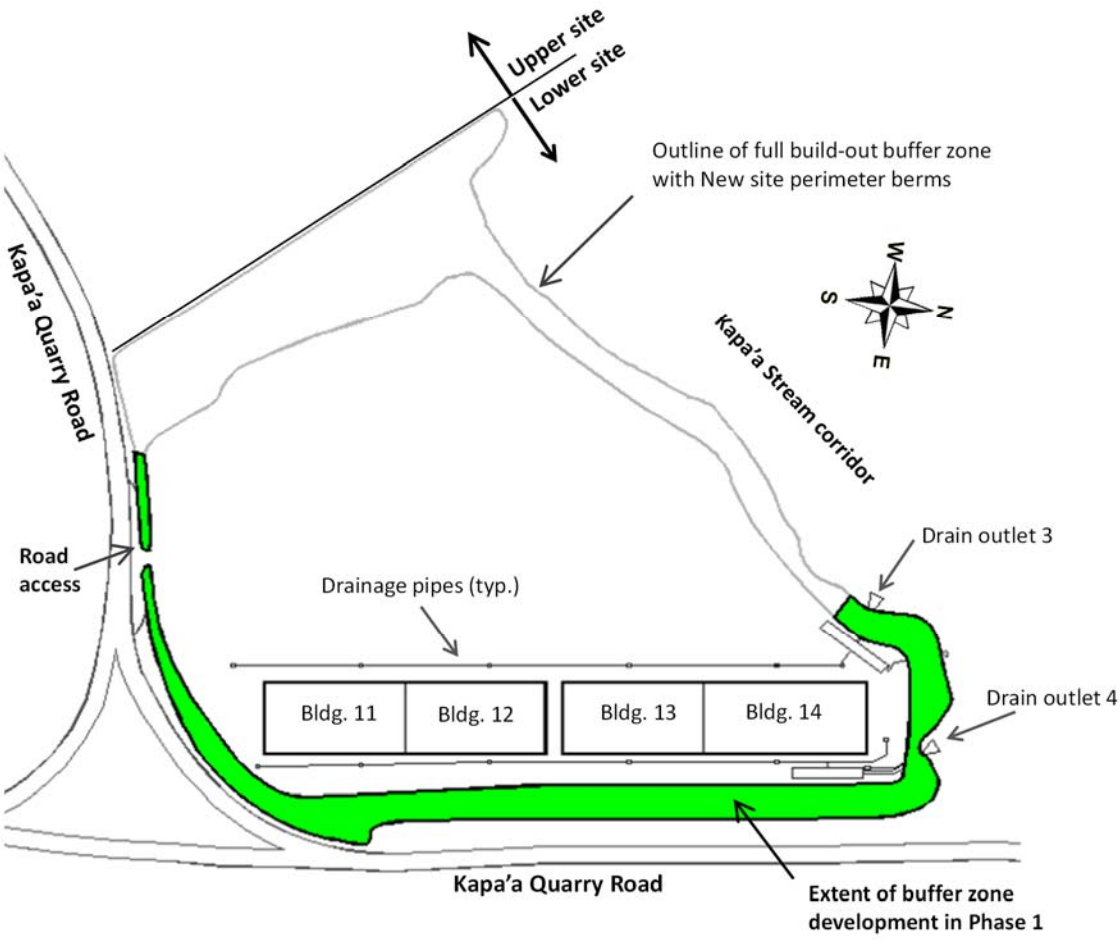


Figure 8.1.: Extent of vegetated buffer zones during site development of the Lower site **Phase 1**

Project Development Phase 2: Figure 8.2 shows the extent of the site development for Phase 2. The new sections of the buffer zone are shown in green shade and the sections of the buffer zone that have been completed in Phase 1 are shown in grey color. Eight buildings will be constructed in Phase 2. The buildings are located to the West of the four buildings which were constructed in Phase 1. The roof areas of these four buildings and the adjacent paved traffic and parking areas will be drained by two drainpipe trains. Each of the two drainpipes terminate in the storm water treatment facilities, which have their own drain outlets, Drain Outlet 1 and 2. Figure 8.2 indicates that a section on the Norther site perimeter will be constructed during Phase 2. The buffer zones will be built on the new site perimeter berms. Trees and shrubs will be planted on the perimeter berms. The vegetation on the berms and the geometry of the berms will combine to provide a vegetative screen between the developed site and the Kapa'a Stream corridor.

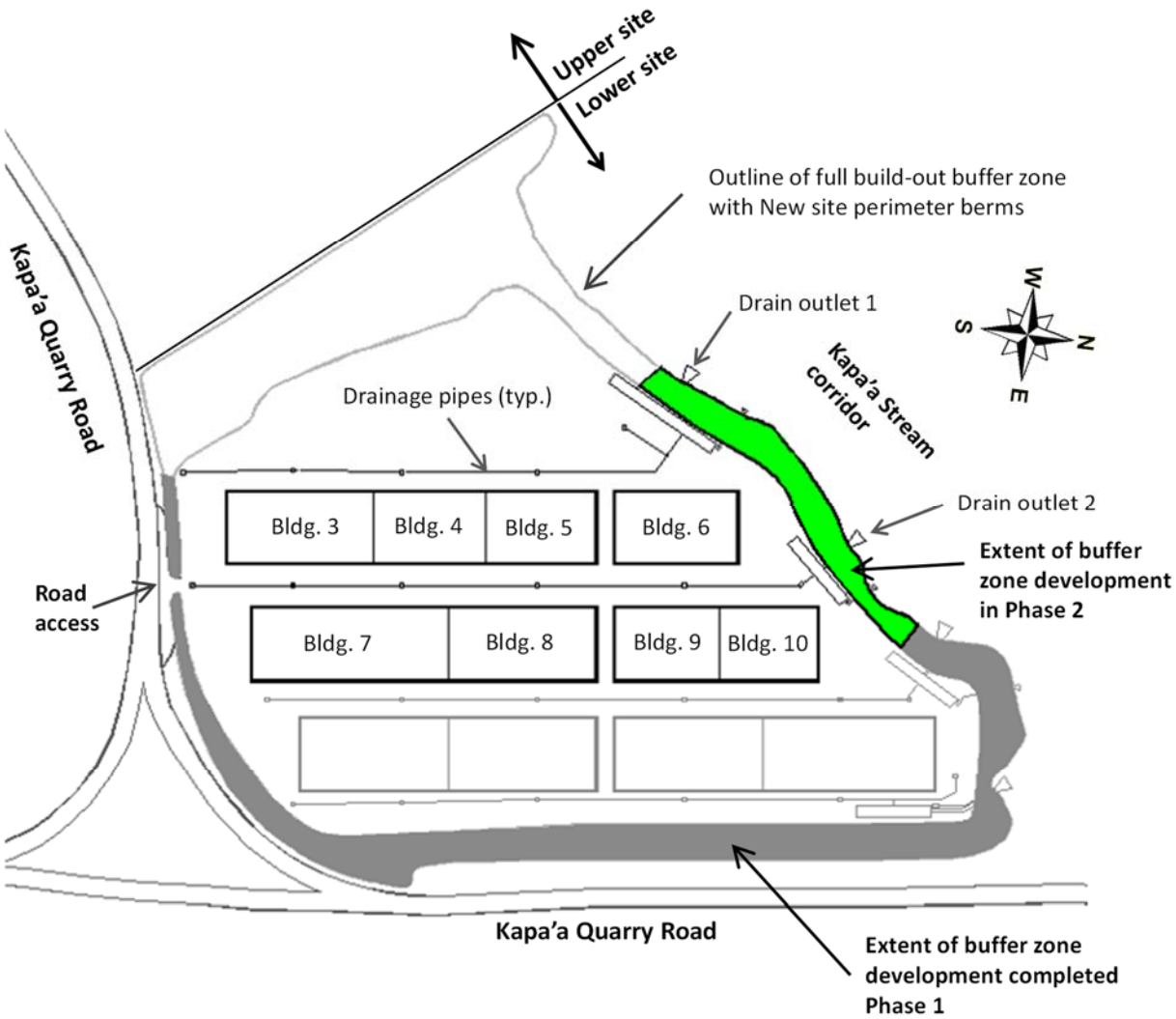


Figure 8.2.: Extent of vegetated buffer zones during site development of the Lower site **Phase 2**

Project Development Phase 3: Figure 8.3 shows the extent of the site development for Phase 3. The new sections of the buffer zone are shown in green shade and the sections of the buffer zone that have been completed in Phases 1 and 2 are shown in grey color. The last two buildings will be constructed in Phase 3. The buildings will be in the most Western part of the Lower site, close to the buffer zone which separate the Lower site from the Upper site. The roof areas of these two buildings and the adjacent paved traffic and parking areas will be drained by lateral drainpipes, which connect to one of the main drainpipes of Phase 2. Figure 8.3 indicates that the remaining section at the Northern buffer zone will be constructed on the new site perimeter. The buffer zone at the Western boundary of the site is a vegetated area located on an existing sloped area. The vegetation within this sloped area will be modified and enhanced. The vegetation on the new site perimeter berm on the Northern site perimeter and the geometry of that berms will combine to provide a vegetative screen between the developed site and the Kapa'a Stream corridor. The vegetation on the sloped area will provide visual impact mitigation for distant views from the east.

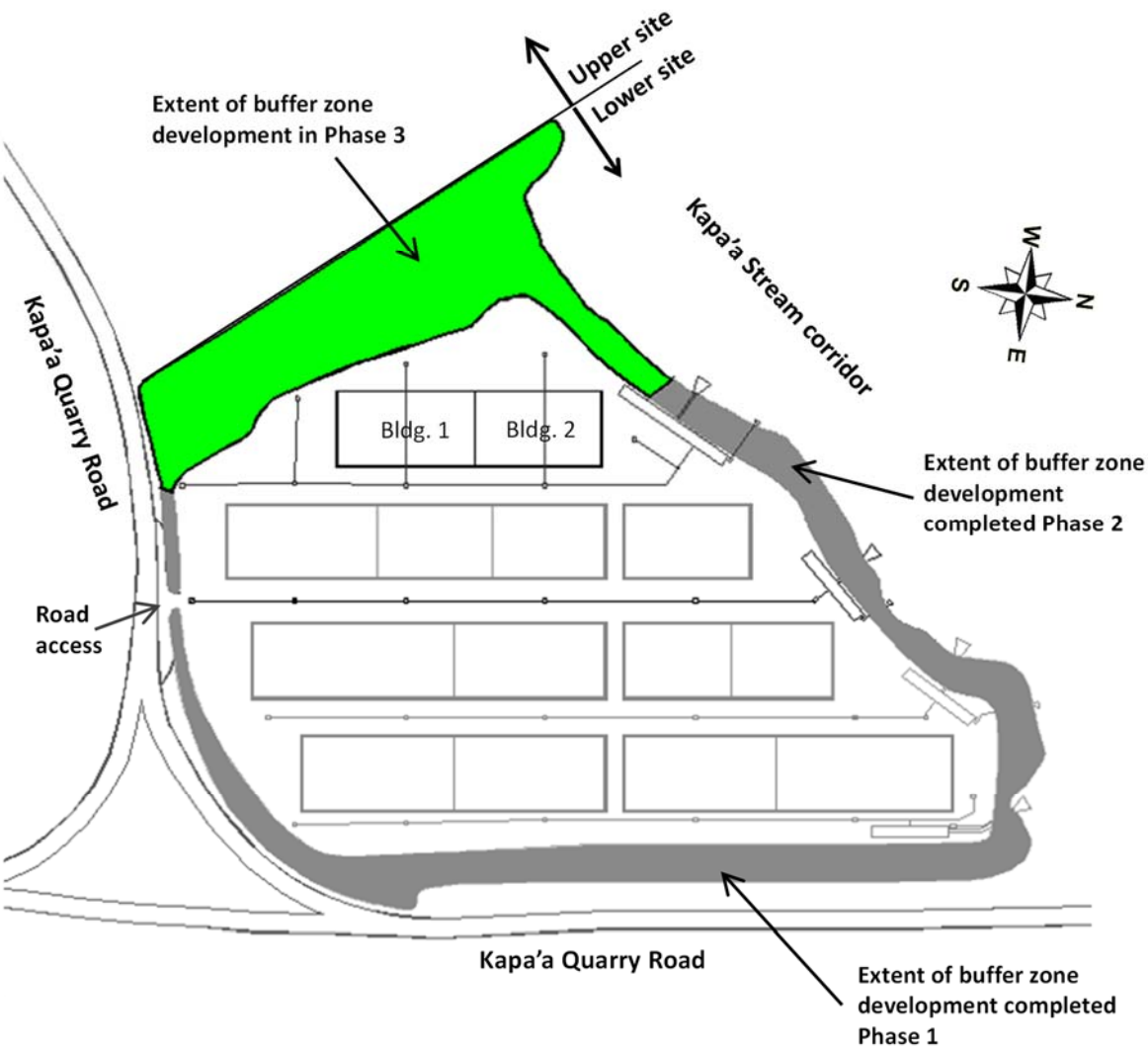


Figure 8.2.: Extent of vegetated buffer zones during site development **Phase 3**

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Appendix J:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

DRAINAGE DITCH ALONG KAPA'A QUARRY ROAD (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix J

Conditions of the Drainage Ditch along the Eastern Boundary of the Lower Site and Proposed Improvements

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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EXECUTIVE SUMMARY

This report describes changing conditions of the drainage ditch along the Western side (mauka) of Kapa'a Quarry Road over the past 20 years. The drainage ditch stretches over a length of 1,200 feet along the Eastern site perimeter of the Lower portion of the project site. The present condition of the drainage ditch would need intervention to avert negative effects of the ditch to the environment and the community.

While the drainage ditch is on land that is owned by the owner and operator of the Kapa'a Light Industrial Park (Applicant) , the City and County of Honolulu has an easement for the roadway and the drainage ditch. Therefore, the responsibility of roadway and drainage ditch maintenance in this section of the road rests with the City and County of Honolulu.

The Applicant has offered to support the City and County of Honolulu in improving the drainage ditch to adjust appearance and boost traffic safety on the adjacent roadway, the Kapa'a Quarry Road, which is narrow and lacks shoulders in this section.

Over the past 20 years soil has accumulated in the drainage ditch and tall vegetation has grown over the ditch. Consequently, at the present time, the drainage ditch can no longer correctly accomplish its design function of collecting storm water runoff from the roadway and the adjacent area and conveying the water towards the Kapa'a Stream.

This report describes the changing conditions of the drainage ditch, illustrating through photographs taken and concept sketches over a twenty-year period, and presents a proposed improvement concept of the drainage ditch which would include the following actions:

- Excavate the existing silty soil and properly dispose of it. The observed high portion of silt in the soil lowers soil permeability and therefore the ability to infiltrate water.
- Replace the excavated soil with engineered fill that can support structural loads of the roadway and walkway/bikeway and promote infiltration.
- Install a roadway shoulder on the Western (mauka) side of the Kapa'a Quarry Road to widen the narrow roadway and allow improved roadway drainage.
- Install a 1,200-foot combined walkway/bikeway on land of the former maintenance road and filled drainage ditch. This combined walkway/bikeway can serve as a portion of the future marsh perimeter pathway in this section. No alternative routing of such a pathway would be possible in this 1,200 feet section of the future marsh perimeter pathway.
- Install a rain garden or vegetated swale on the Western side along the 1,200-foot section of Kapa'a Quarry Road to capture runoff and provide low impact development storm water treatment.
- Install a drainage pipe within the filled drainage ditch to provide proper conveyance of excess storm water towards the Kapa'a Stream corridor if volume runoff exceeds infiltration capacity of the rain garden/vegetated.
- Remove invasive plants that are growing on the area of the filled drainage ditch and landscape the area with native or adaptive plant species, including new trees.

SECTION 1 - LOCATION AND BASIC CONFIGURATION OF THE DRAINAGE DITCH

The "drainage ditch" is a drainage channel that stretches for about 1,200 feet along the Western (mauka) side of the Kapa'a Quarry Road, fronting the Eastern boundary of the Lower portion of the project site. Figure 1.1 shows the location map of the drainage ditch. The location of the ditch is illustrated with the white boundary in Figure 1.1. The ditch starts around 200 feet North of the intersection of the Kapa'a Quarry Road and Kapa'a Quarry Place and ends at the confluence with the Kapa'a Stream.

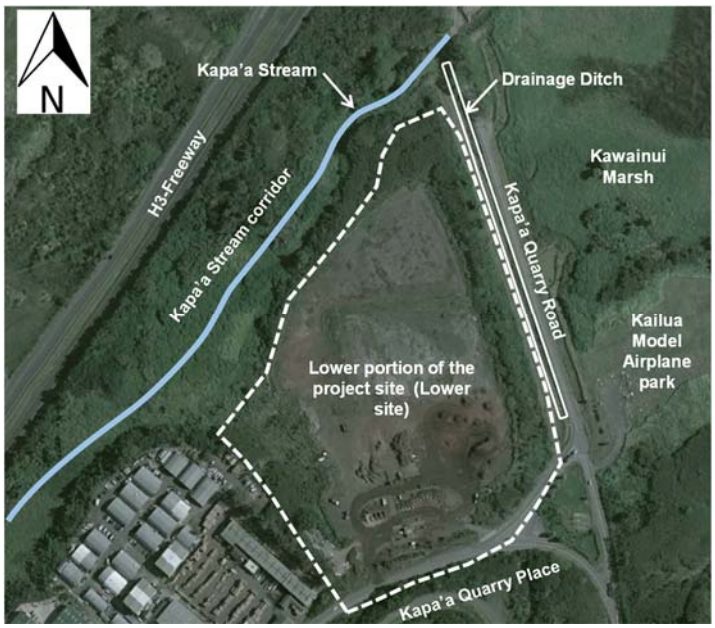


Figure 1.1: Loaction map of the drainage ditch

The "drainage ditch" is a shallow swale along the Western side of the Kapa'a Quarry road right next to the Eastern boundary of the Lower site.
The drainage ditch conveyes storm water toward the North, toward the Kapa'a Stream corridor.

The drainage ditch was designed to drain the land to the West of the Kapa'a Quarry Road and convey the collected water to the Kapa'a Stream. Figure 1.4 through 1.9 show photographic images that illustrate the configuration of the drainage ditch in relationship to the Kapa'a Quarry Road and the adjacent maintenance road. 1.2 shows a simplified (not to scale) illustration of a typical cross section through the perimeter berm, showing the location of the drainage ditch. Figure 1.3 defines the directions of the views and location of the viewpoints shown in Figures 1.4 through 1.9.

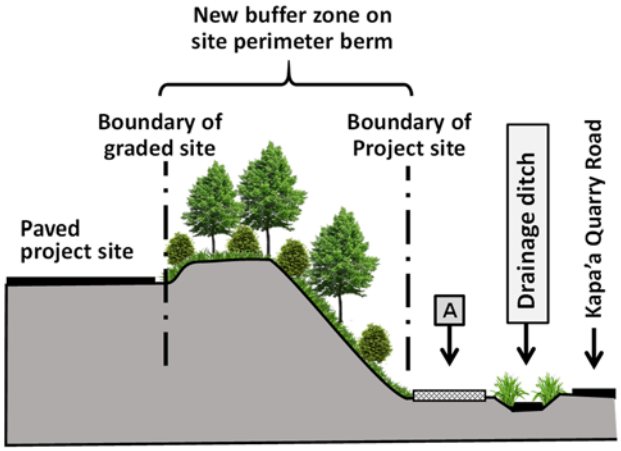


Figure 1.2: Cross-Section A-A; looking towards the North

The representative cross section shows the new buffer zone which will be located on the site perimeter berms. Just adjacent of the foot of the perimeter berm is a maintenance road [A] and the drainage ditch. The Kapa'a Quarry Road roadway is located next to the drainage ditch.

(for illustration, not to scale)

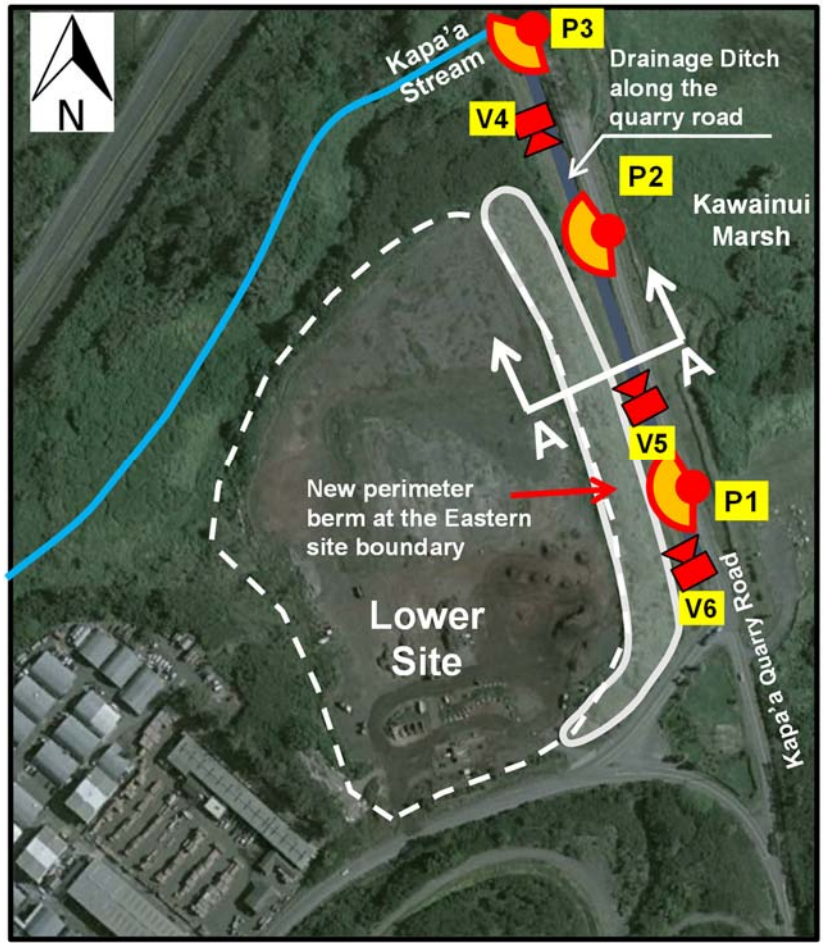


Figure 1.3: Locations and view directions of the images in Figures 1.4 through 1.9

Figure 1.4 shows the panoramic view P1 along the drainage ditch from the start (at the left in the image) towards the middle of the drainage ditch. In 2011, when this photo was taken, the water surface of the drainage ditch was covered with algae.

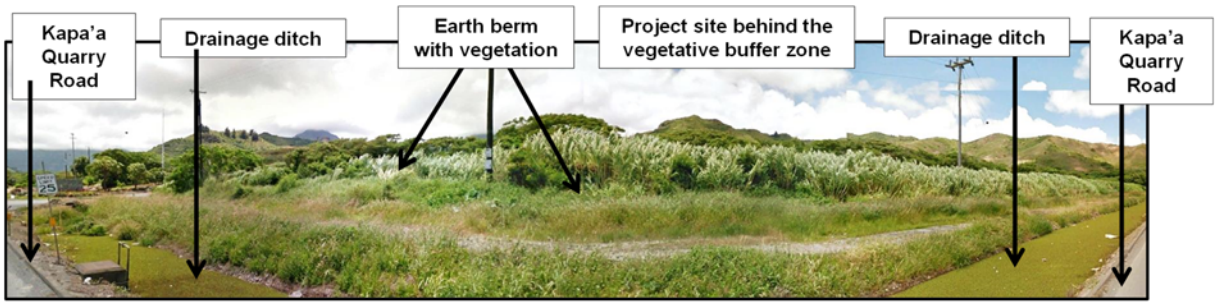


Figure 1.4 - Panoramic View P1 : Drainage ditch along the Western side of Kapa'a Quarry Road (looking towards the project site)

Figure 1.5 shows the panoramic view P2 along the drainage ditch from the middle (at the left in the image) towards the end of the drainage ditch (at the right edge of the image). In 2011, when this photo was taken, the water surface of the drainage ditch was partially covered with algae.

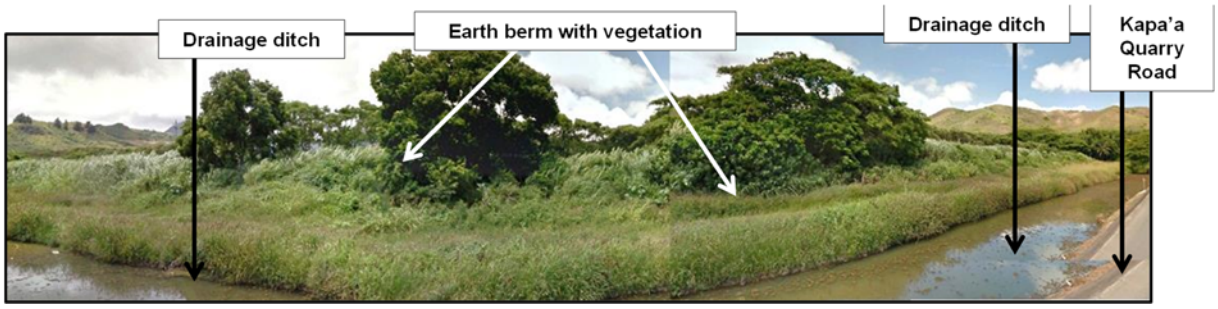
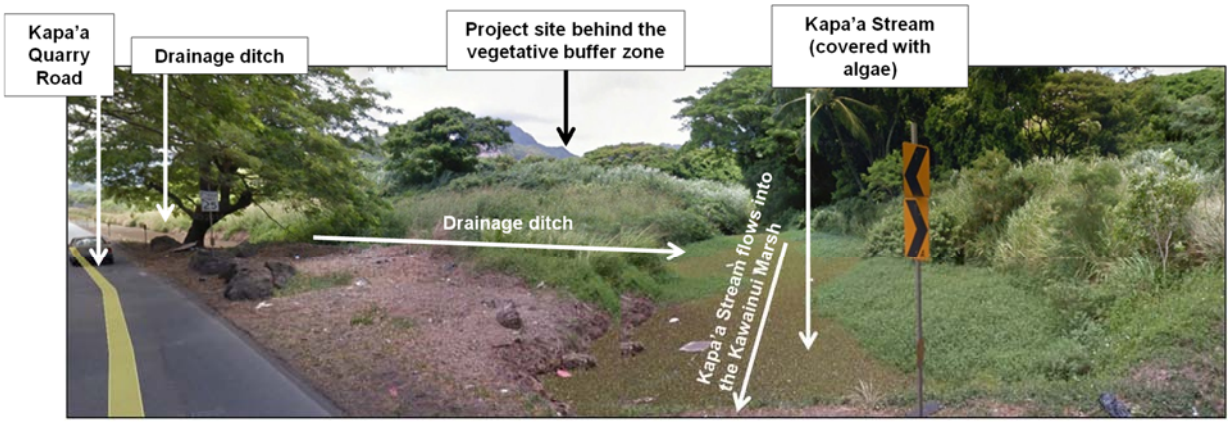


Figure 1.5 - Panoramic View P2 : Drainage ditch along the Western side of Kapa'a Quarry Road (looking towards the project site)

Figure 1.6 shows the panoramic view P3 which depicts the location where the drainage ditch connects to the Kapa'a Stream. In 2011, when this photo was taken, the water in the lower stretches of the Kapa'a Stream was covered with algae. The Kapa'a Stream drains into the Kawainui Marsh through a culvert below the Kapa'a Quarry Road.



View V3 : Confluence of Kapa'a Stream and Drainage ditch along the quarry road (looking towards the project site)

Figure 1.6 - Panoramic View P3 : Confluence of Kapa'a Stream and Drainage ditch along the quarry road (looking towards the project site)

Figures 1.7 through 1.9 show view images V4 through V6. The images show the drainage ditch, taken from the North and the South. The drainage ditch is located between the Kapa'a Quarry Road and a non-paved maintenance road.

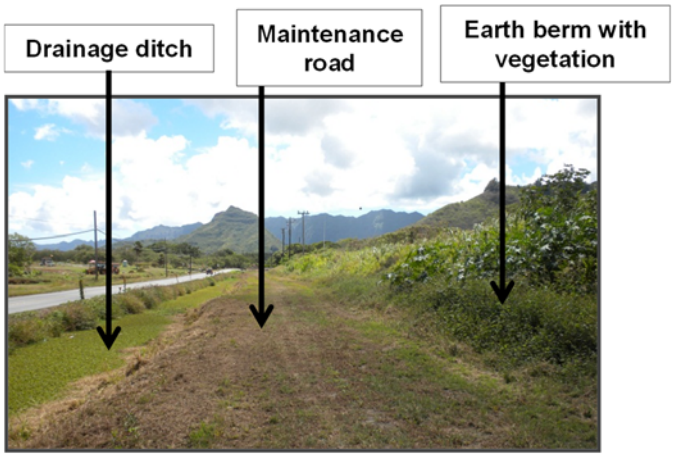


Figure 1.7 – View V4: View along the drainage ditch, towards the South

The image was taken in 2011 and clearly shows the geometry of the drainage ditch in relationship to the Kapa'a Quarry Road and the adjacent maintenance road. To right in the image is the existing buffer zone that separates the Lower site from the Kapa'a Quarry Road. In the image the water surface in the drainage ditch is covered with algae.

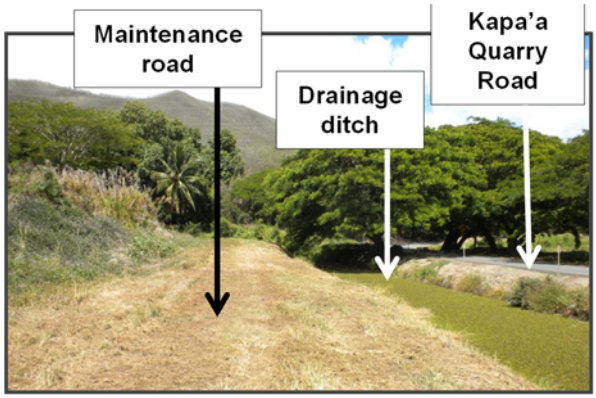
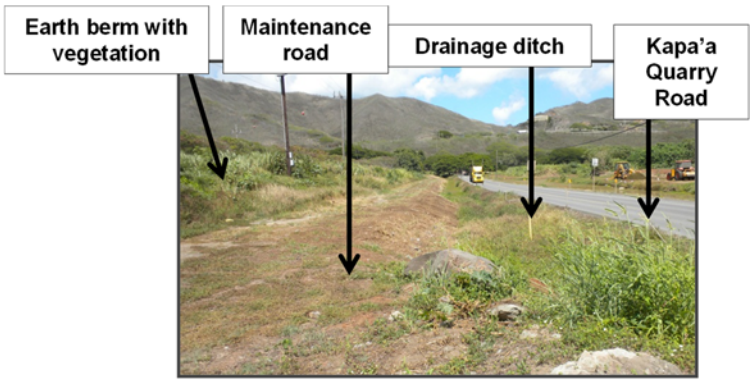


Figure 1.8 – View V5: View along the drainage ditch, towards the North

The image from 2011 and shows the drainage ditch in relationship to the Kapa'a Quarry Road and the adjacent maintenance road. To left in the image is the existing buffer zone that separates the Lower site from the Kapa'a Quarry Road. In the image the water surface in the drainage ditch is covered with algae.



View V6: View along the drainage canal, towards the North

Figure 1.9 – View V6: View along the drainage ditch, towards the North

The image from 2011 and shows that the drainage ditch starts at the point where the tip of the arrow with the label "Drainage Ditch". To left in the image is the existing buffer zone that separates the Lower site from the Kapa'a Quarry Road. In the image the water surface in the drainage ditch is covered with algae.

SECTION 2 – JURISDICTION AND MAINTENANCE RESPONSIBILITY

The land on which the Kapa'a Quarry Road and the drainage ditch is located, within TMK 4-2-15:014, belongs to Kapa'a 3, LLC, the Co-Owner and Operator of the Kapa'a Light Industrial Park. The City and County of Honolulu has the road and utility easement for the Kapa'a Quarry Road and the drainage ditch in this section.

Figure 2.1 shows a portion of the surveying map depicting the project boundary of the Lower site (the I-1 rezoned land), the property boundary of TMK 4-2-15:014 and the location of the Kapa'a Quarry Road, including extent of easement. Figure 2.1 delineates that the roadway and drainage ditch (on the Western side of the Kapa'a Quarry Road) is within the Kapa'a 3, LLC property.

Property document of TMK 4-2-15:14 indicates that the road and utility easement is granted to the City and County of Honolulu.

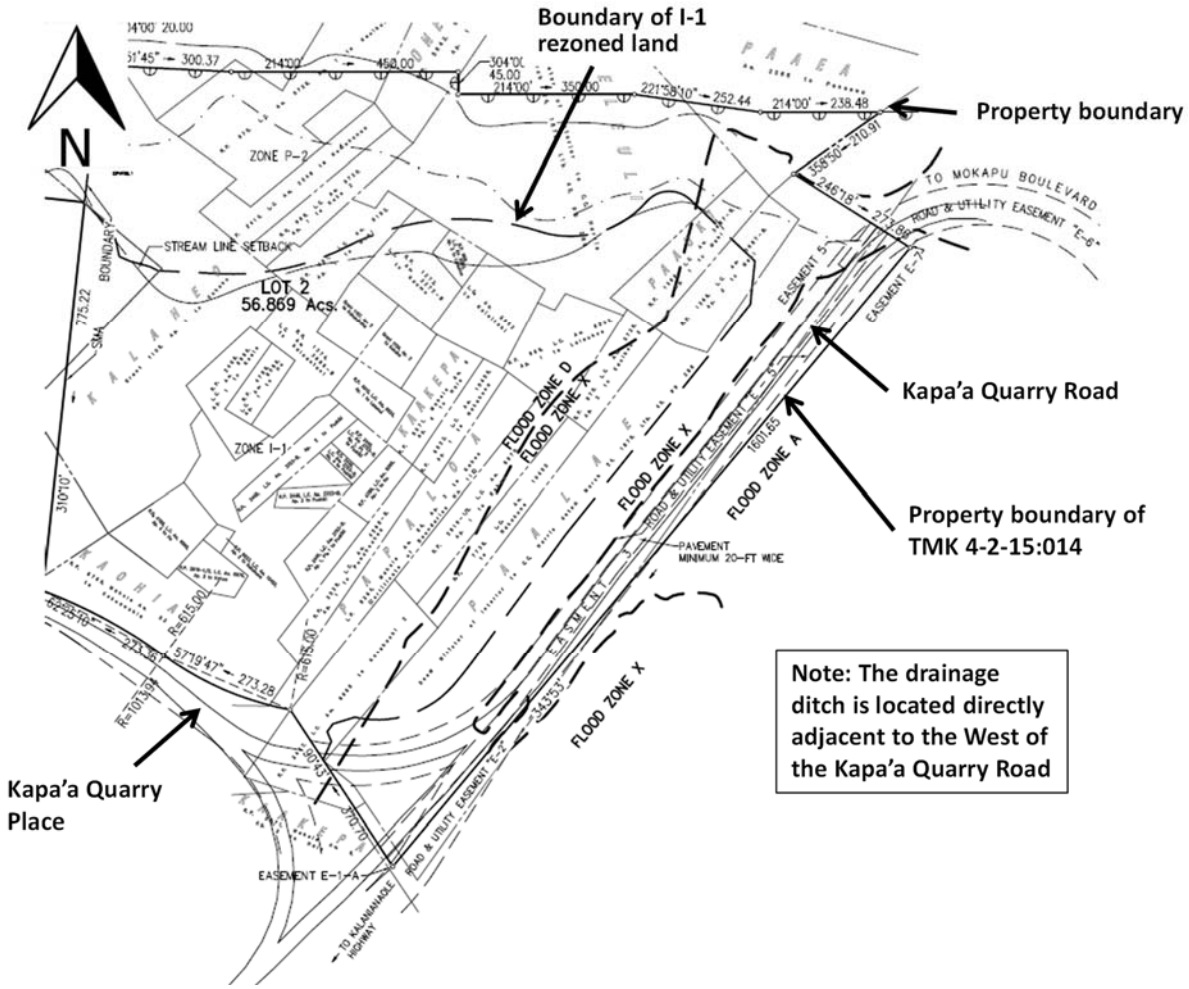


Figure 2.1: Survey map of the Lower site, showing the property ownership and easement of the Kapa'a Quarry Road and the drainage ditch

SECTION 3 – CHANGE OF CONDITIONS OF THE DRAINAGE DITCH OVER TIME

Section 3 illustrates the changes in the conditions of the drainage ditch over the past 20 years. The series of images represent photos obtained by Sustainable Design & Consulting LLC (the author of this report), photos taken by the media, and images obtained from Google Earth.

Figure 3.1 shows a 2003 image of the drainage ditch which was published by the Honolulu Advertiser.

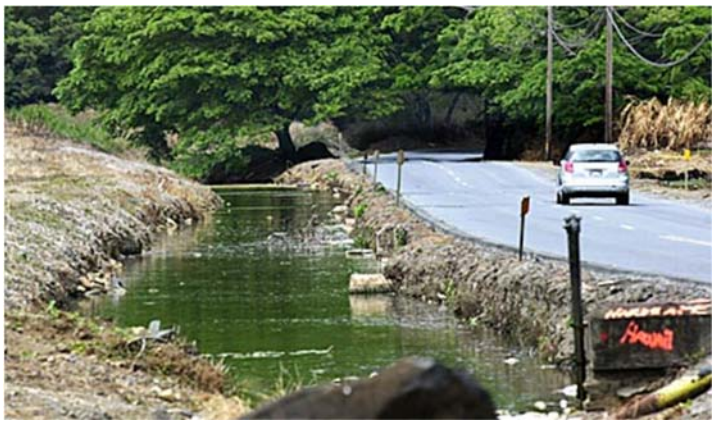


Figure 3.1: Image of the drainage ditch from 2003 (Source Honolulu Advertiser archive)

The image shows the drainage ditch with a free surface, looking North. The Kapa'a Quarry Road in on the right in the image. The image illustrates problems with dumping of trash into the drainage ditch. The owner and operator of the Kapa'a Light Industrial Park (Applicant) has been part of a community group to restore the drainage ditch by periodically removing the trash into the drainage ditch and work with authorities to avert illegal dumping.

Figures 3.2 and 3.3 show the condition of the drainage ditch in 2011.

Figure 3.2: Image of the drainage ditch from 2011

View along the drainage ditch, towards the North The (unpaved) maintenance road is on the left. The Kapa'a Quarry Road is on the right. The drainage ditch is between the maintenance road and the Kapa'a Quarry Road.

Figure 3.3: Image of the drainage ditch from 2011

View along the drainage ditch, towards the South The (unpaved) maintenance road is on the right. The Kapa'a Quarry Road is on the left . The drainage ditch is between the maintenance road and the Kapa'a Quarry Road

Figure 3.4 shows the conditions of the water surfaces of the drainage ditch, as observed in 2010. The figure shows that the ditch had no free water surface. The drainage ditch is shown with a continuous cover of Salvinia Molesta (green water plant floating on the water surface). The vegetative buffer around the lower portion of the proposed site commences at the foot of the existing earth mounds about 30 feet mauka from the top of bank of the canal (on the image right).

Figure 3.4: Image of the drainage ditch from 2010

View along the drainage ditch, towards the South. The water surface is covered with algae. The image shows that there is no shoulder of the roadway and that the drainage ditch is directly adjacent to the roadway, only separated by a small curb.

Figure 3.5 shows an image of the Kapa'a Quarry Road with the two drainage swales on both side of the roadway, taken in 2011. The referred to "drainage ditch" is on the **left side** of the roadway in Figure 3.5 Figures 3.6 and 3.7 show two images of the drainage ditch taken the same year.

Figure 3.5: Two drainage swales on both side of the Kapa'a Quarry Road fronting the Lower site

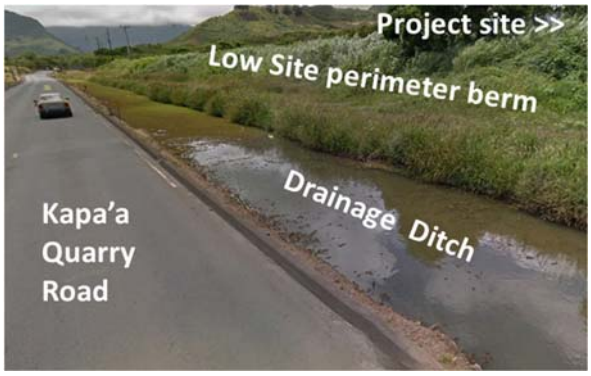


Figure 3.6: Drainage ditch looking South

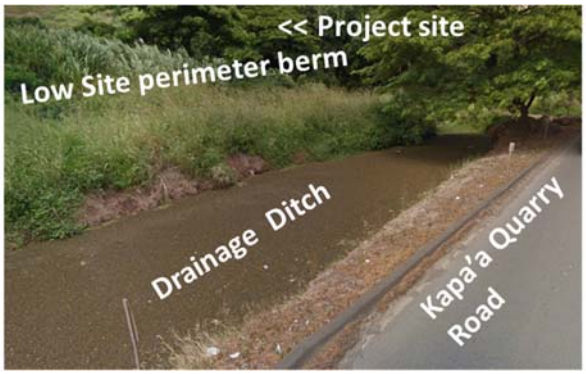


Figure 3.7: Drainage ditch looking North

Figures 3.8 through 3.11 show the condition of the drainage ditch in photos taken in 2020. There is a dense vegetation layer covering both the drainage ditch and the maintenance road.

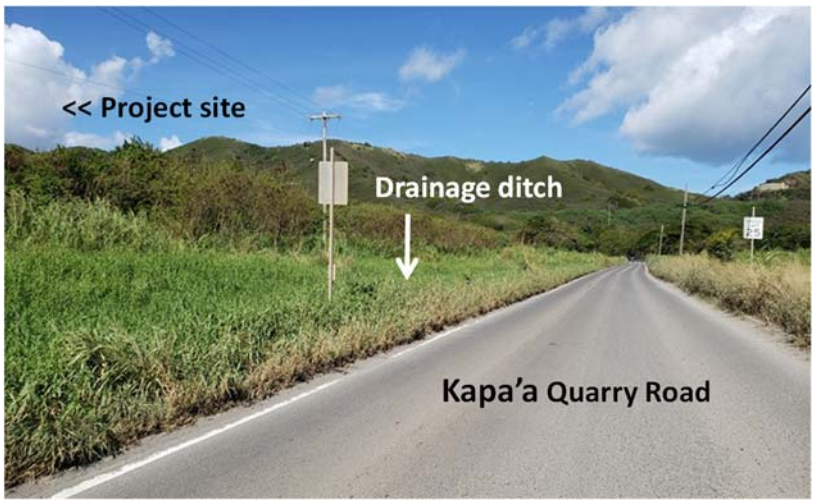


Figure 3.8: Condition of the drainage ditch in 2020.

Looking North along the Kapa'a Quarry Road

There is a dense vegetation layer covering both the drainage ditch and the maintenance road. Both sides of the quarry road have tall and dense vegetation. The image shows that the roadway has no shoulder in this section.

Figure 3.9: Condition of the drainage ditch in 2020.

Looking North along the Kapa'a Quarry Road

The image shows a dense vegetation layer covering both the drainage ditch and the maintenance road

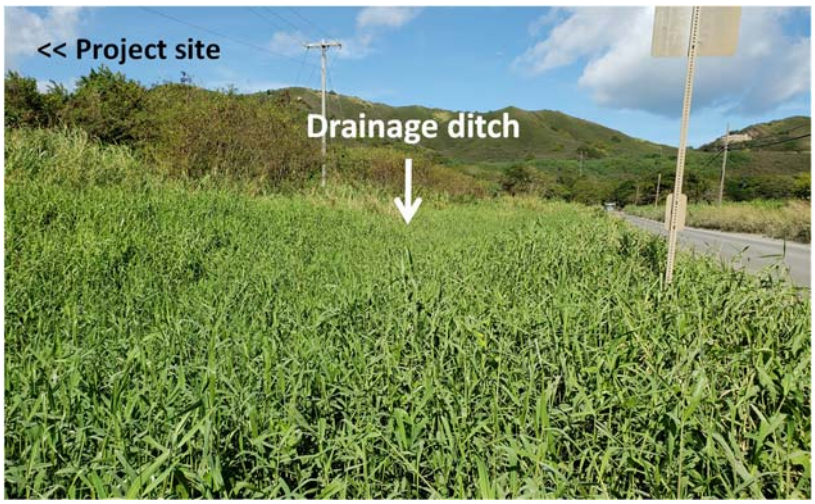


Figure 3.10: Condition of the drainage ditch in 2020.

Looking North along the Kapa'a Quarry Road

The image shows a dense vegetation layer covering both the drainage ditch and the maintenance road

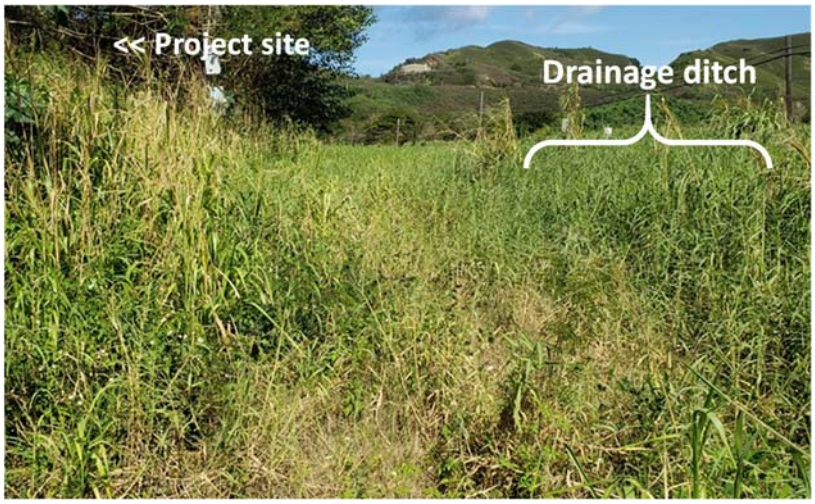


Figure 3.11: Condition of the drainage ditch in 2020.

Looking North along the Kapa'a Quarry Road

The image shows a dense vegetation layer covering both the drainage ditch and the maintenance road

Figures 3.12 through 3.15 illustrate changing conditions of the drainage ditch over the past 20 years by schematic renderings.

Figure 3.12 reflects the conditions of the drainage ditch up to about 2005. The drainage ditch had a free a water surface for most of the ditch. The maintenance road had a gravel surface allowing free access the drainage ditch for maintenance and removal of accumulated debris and trash.

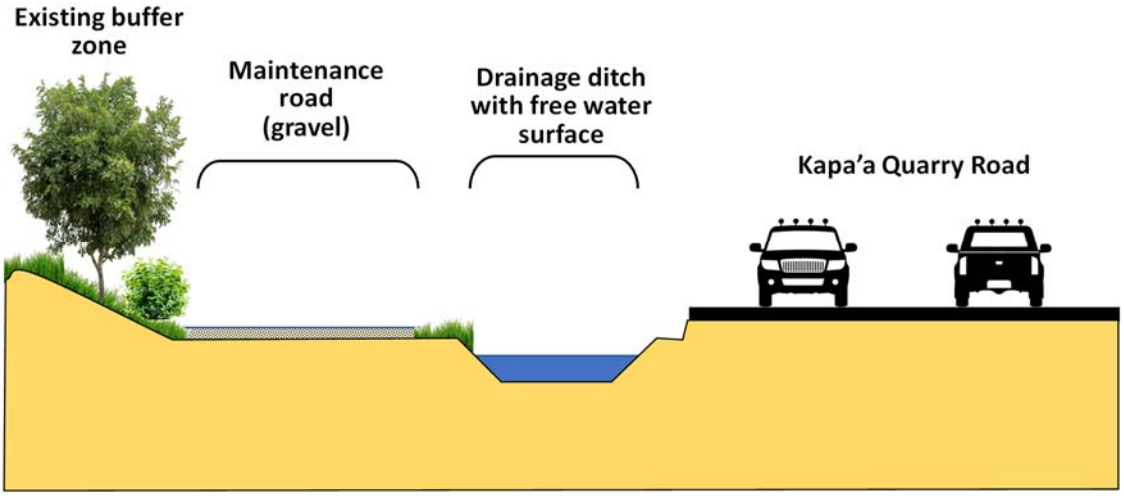


Figure 3.12: Schematic of condition of the drainage ditch around 2005 (illustration not to scale)

Figure 3.13 indicates changes to the drainage canal. By about 2010 a layer with algae started to cover most of the drainage ditch. The maintenance road had a layer of vegetation on top of the gravel base.

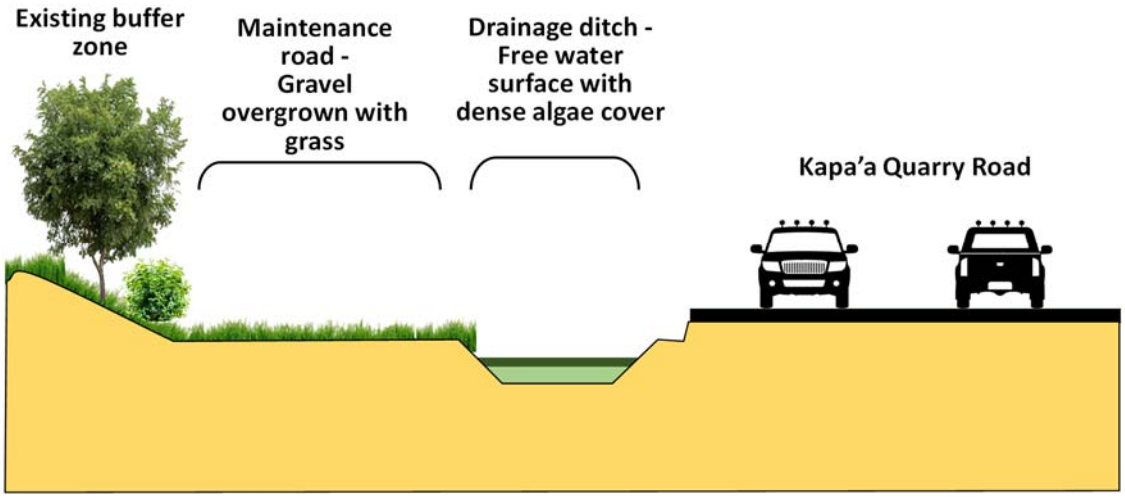


Figure 3.13: Schematic of condition of the drainage ditch around 2010 (illustration not to scale)

Figure 3.14 indicates more significant changes happening to the drainage canal. By about 2013 the ditch started to be filled entirely with soil and vegetation covered the drainage ditch. From that time onwards there was no more free water surface noticeable, and it was possible to walk over the accumulated soil during dry periods.

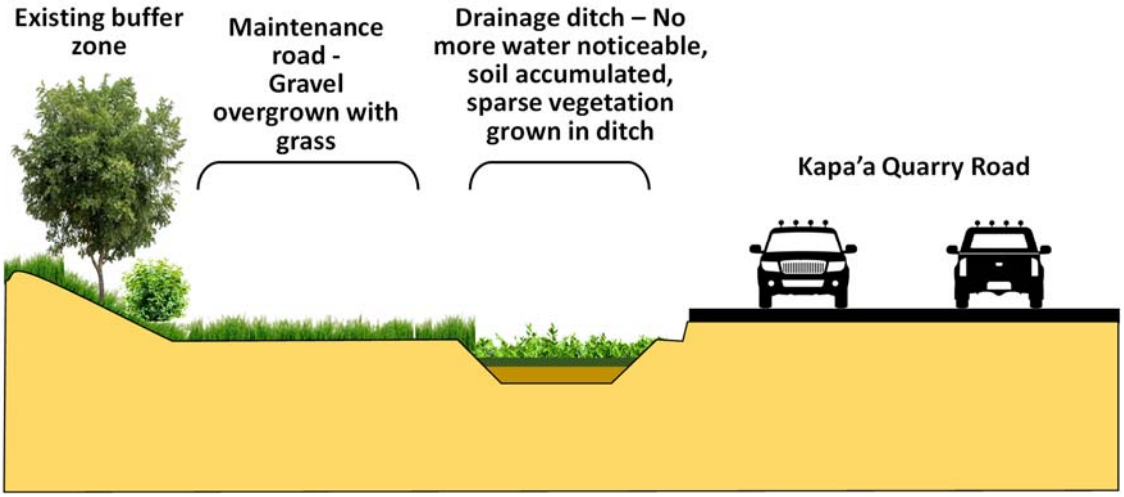


Figure 3.14: Schematic of condition of the drainage ditch around 2013 (illustration not to scale)

Figure 3.15 indicates the condition of the drainage canal at the present time. There is a dense layer of tall weeds covering both the "former" drainage ditch and the adjacent maintenance road.

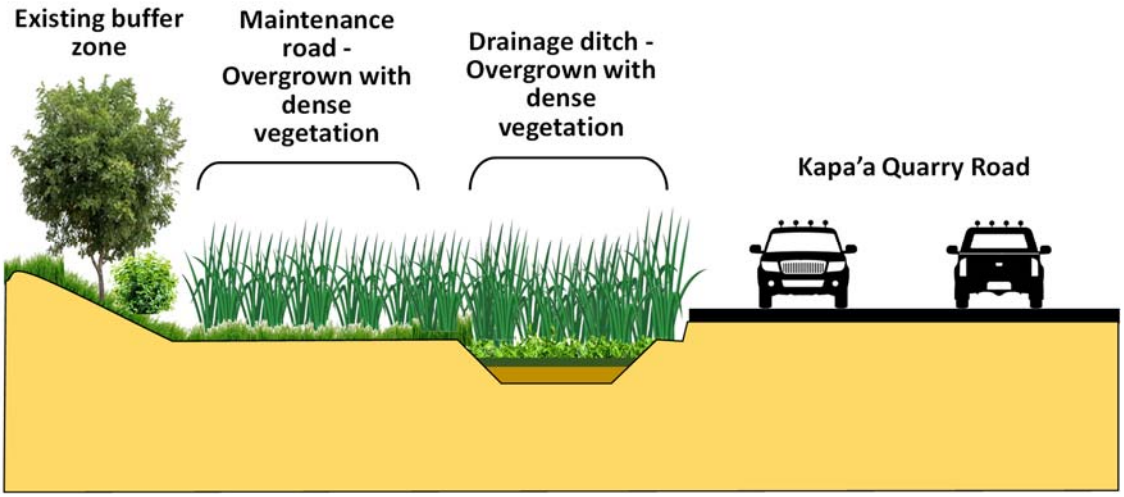


Figure 3.14: Schematic of condition of the drainage ditch at present (illustration not to scale)

SECTION 4 – PROPOSED CHANGES OF THE DRAINAGE DITCH

As was described the drainage ditch has undergone significant changes over the past 20 years. The original design function of the drainage ditch was to collect storm water runoff and convey the water toward the confluence of the Kapa'a Stream.

As was described at the present time the ditch is filled with soil, consequently the storm water conveyance capacity has been significantly decreased. With the intended sealing of the adjacent inner project area within the Lower site with non-pervious pavement it is expected that less water coming from the project site will reach the drainage ditch.

It is assumed to be prudent to alter the geometry of the drainage ditch and basically change its function as an open storm water conveyance swale. Figure 4.1 illustrates the proposed modification of the drainage ditch.

Under the proposed approach, the existing swale bed would be excavated, and the accumulated silty soil would be removed. The ditch bed would be filled with engineered fill which will allow structural support for a new road shoulder and a new combined walkway / bikeway. Runoff from the roadway and adjacent area would be drained toward a new rain garden / vegetated swale. Water in the vegetated swale would infiltrate and enter the permeable subgrade. The excess storm water that would not infiltrate would enter a perforated drainpipe which would convey water toward the Kapa'a Stream.

As the typical cross section in Figure 4.1 indicates there would be a new about 8-foot combined walkway/bikeway. This new combined walkway/bikeway would stretch over a length of 1,100 feet along the Eastern site perimeter of the Lower site; starting at the intersection of the Kapa'a Quarry Road with the Kapa'a Quarry Place in the South and ending at the Northern property boundary of TMK 4-2-15:014.

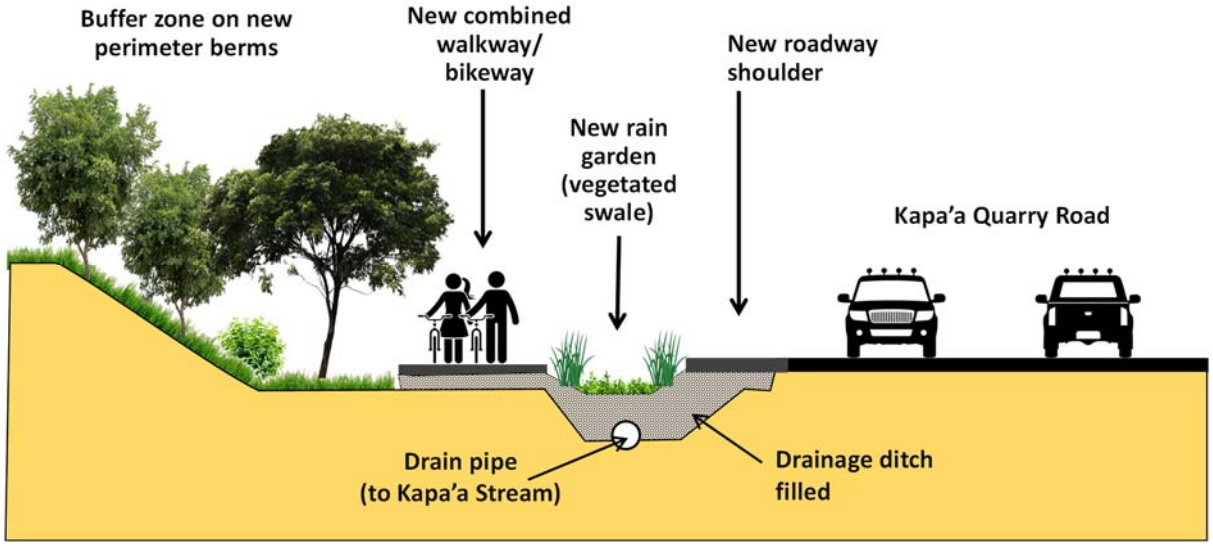


Figure 4.1: Proposed modification of the drainage ditch

Benefits:

The proposed modification of the drainage ditch would provide to the following benefits:

Appearance: The modification of the drainage ditch would provide a better appearance of the areas in front of the Eastern site perimeter of the Lower site. The area would be converted from uncontrolled growth to a landscaped area with several attractive natural elements.

Avoidance of flooding: As reported in the news the Kapa'a Quarry Road periodically must be closed due to flooding. The new configuration and the addition of a vegetated swale would accommodate quantities of storm water runoff and therefore avoid some flooding events of this road section.

Increase safety on the roadway: Over a length of about 1,200 feet the Kapa'a Quarry Road is a narrow roadway that lacks shoulders on both side. Shoulders would provide a safety buffers and opportunity to stop cars. At the present time, the roadway is an about 24-foor wide paved road that has curbs on both sides of the roadway. Beyond the curbs there is presently no space. The proposed widening of the roadway would improve traffic safety on the section of the Kapa'a Quarry Road.

Combined walkway / bikeway: Plans are progressing to construct a Perimeter walk/bikeway around the Kawainui Marsh. The owner and operator of the Kapa'a Light Industrial Park (Applicant) is the property owner of the land on which the drainage ditch is located. The Applicant has offered to use of the land on top of the modified drainage ditch to install a 1,200-foot section of the marsh perimeter walkway. The proposed combined walkway/bikeway would be the preferred routing, given the fact that an alternative path of the perimeter path would be difficult and next to impossible in this road section. At the present there is basically no opportunity for a person to safely walk or bike along the Kapa'a Quarry Road in this section.

Better drainage of the area: Installing the proposed modification of the drainage ditch would improve the drainage of the land adjacent to the modified drainage ditch, which includes the roadway.

Stormwater pollutant removal in vegetated swale: The vegetated swale is a recognized BMP for storm water pollutant removal. The vegetated swale would therefore improve the water quality.

Private funding to contribute to improvements: The Applicant has offered to bear a portion of the costs of modifying the drainage ditch and install the combined walkway/bikeway. The Applicant has offered to install additional trees, shrubs, and ground cover on the mountain side of the walkway/bikeway. This private public partnership would be a significant value to the community.

Environmental impacts: Impact would be reduced during operation. There would be some impact during the construction, but these impacts could be readily mitigated by commonly used storm water and other Best Management Practices.

Appendix K:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

STATUS OF PROJECT SITE DEVELOPMENT WORK (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop the Proposed

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix K

Status of Zone Change Unilateral Agreement Compliance

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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EXECUTIVE SUMMARY

This report described the status of compliance to conditions set forth in the Unilateral Agreement (UA) of the Conditional Zone Change (City and County of Honolulu, Ordinance 13-35).

This report is being prepared at the request of DPP to reflect activities of the owner and operator of the Kapa'a Light Industrial Park (Applicant) to comply with the conditions of the UA.

Furthermore, this report delineates how the proposed actions in the Draft SEIS conform with the conditions of the UA and what actions are outstanding and would be required to conform with all UA conditions.

This report is structured in accordance with the UA conditions 1 through 7. This report summarizes the most important site development, design and permitting actions and provides timelines.

SECTION 1 – INTRODUCTION

The letter dated January 7, 2021, by the Department of Planning and Permitting (DPP) in response to the Draft SEIS included a statement to report on the status of compliance to the Unilateral agreement (UA) which are part of the conditional zone change for Parcel TMK 4-2-15:014.

Excerpts of the January 7 DPP letter that pertain to the UA compliance are presented in Figures 1.1 and 1.2.

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KIRK CALDWELL
MAYOR

EUGENE H. TAKAHASHI
ACTING DIRECTOR

January 7, 2021 2020/ED-7 (ZS)

SENT VIA EMAIL

Mr. Manfred Zapka
sustainableDC@gmail.com

Dear Mr. Zapka:

SUBJECT:	Chapter 343, Hawaii Revised Statutes Draft Supplemental Environmental Impact Statement (EIS)
Project:	Modifications to the Kapaa Light Industrial Park
Applicant:	KAPAA I, LLC and KAPAA III, LLC (John and Paul King)
Agent:	Sustainable Design & Consulting, LLC (Manfred Zapka)
Location:	905 Kalanianaole Highway - Kailua
Tax Map Keys:	4-2-015: 006, 008, and 012 (EIS)
Tax Map Keys:	4-2-015: 013 and 014 (Supplemental EIS)

Figure 1.1: Head of the January 7 DPP letter in response to the Draft SEIS

- Most of the guidelines for Light and Extractive Industry, outlined in KPSCP Section 3.6.2.4, are covered in the Unilateral Agreement (UA) conditions of the Zone Change, Ordinance 13-35. Compliance with UA conditions determine conformity with the KPSCP. Condition 6 of the UA requires that a "written status report to the DPP documenting its satisfaction and/or describing progress towards complying with each condition" be submitted every year by December 31st to the DPP. This condition has not been fulfilled since 2015.

  In the absence of annual report(s), please include in the Final Supplemental EIS a more detailed summary of, if and how the proposed action in the Draft Supplemental EIS meet each of the UA conditions of Ordinance 13-35, and if any approved plans need updating.

Consult with DPP's Traffic Review Branch as to whether additional updates to the fulfillment of UA Condition 1 relating to transportation may be required as a result of the proposed action in the Draft Supplemental EIS. UA Condition 2 requires a vegetated buffer zone around the Project to mitigate noise and visual impacts. Expand on how the proposed improvements, such as modifications to increase the heights and widths of the berms and proposed use of native plant species, address UA Condition 2. UA Condition 3 relating to stormwater treatment and flood control are being fulfilled by the proposed action and have triggered a need for this Supplemental EIS. The KPSCP guideline regarding harmful leachate is being addressed in the updated site development plan by sealing the surface of the site with an impervious cover. Stormwater Best Management Practices (BMPs) under the 2011 Final EIS have been replaced by stormwater BMPs which are more effective in treating stormwater runoff. Verify with the DPP Civil Engineering Branch for consistency with UA Condition 3. Finally, the UA condition requiring lighting impact mitigation has been approved by the DPP and the Department of Land and Natural Resources (DLNR), addressing KPSCP guidelines regarding full-shielded lighting that balances the needs for public safety, security, energy conservation, and wildlife protection. Please indicate how the proposed additional warehouse structures and tenants will comply with the exterior lighting plans approved by DLNR in 2014 and 2016, and include documentation of consultation with DLNR as needed.

Figure 1.2: January 7 DPP letter requirement of providing status of the UA implementation

In Sections 2 through 8 the different conditions of the UA agreement are mentioned

SECTION 2 – TRANSPORTATION

The UA condition 2 pertains to Transportation and has the following conditions.

1. Transportation. The Declarant shall carry out the following requirements related to traffic and transportation improvements for the Project:

a. A time line establishing the anticipated commencement and completion dates of the major phasing components of this development shall be prepared by the Declarant in a format acceptable to the Department of Planning and Permitting (DPP). The time line should identify when the construction management plan (CMP), the traffic management plan (TMP),and updates to the initial TIAR, dated November 2012, will be submitted for review and approval.

b. The Declarant shall submit a CMP to the DPP for review and approval, as required, prior to the issuance of building permits for the purpose of developing the Land.

The CMP shall identify the type, frequency and routing of heavy trucks, and construction related vehicles. Every effort shall be made to minimize impacts from these vehicles and related

2

construction activities. The CMP shall include provisions to limit vehicular activity to periods outside of the peak periods of traffic, utilize alternate routes for heavy trucks, utilize staging locations for construction workers and vehicles, and other mitigation measures related to traffic. The Declarant shall document the condition of roadways prior to the commencement of construction activities and provide remedial measures, as necessary, such as restriping, road resurfacing, and/or reconstruction if the condition of the roadways has deteriorated as a result of the construction activities.

c. A TMP shall include traffic demand management (TDM) strategies to minimize the amount of vehicular trips for daily activities and large events. TDM strategies could include carpooling and ride sharing programs, transit incentives, including provisions for a shuttle service from public transit stops at Mökapu Boulevard and Kalaniana'ole Highway, and other similar TDM measures.

d. The Declarant shall prepare and submit an updated TIAR, covering the same area as the TIAR submitted with this zone change application, to the DPP for review and approval, as required, prior to initiation of Phase D of the project phasing plan attached hereto as Exhibit B and made a part hereof. The Declarant shall not begin construction of Phase D or the DPP-approved equivalent of remaining buildings until receiving the DPP approval of the completed TIAR since mitigation may be required to accommodate future development traffic. The DPP will determine if recommendations from the TIAR are necessary for the Declarant to implement.

e. The Declarant shall enter into an agreement with the DPP and the Department of Transportation Services (DTS) prior to building permit approval for the development of the Land. The agreement shall be finalized by the DPP and subject to amendments, as approved by the DPP.

As part of the agreement, the Declarant shall fund, construct, or cause to be constructed all necessary street improvements along the Project's frontage of Kapa'a Quarry Road and Kapa'a Quarry Access Road, or at other locations along these roadways if determined necessary by the DPP and DTS for development purposes at the Project site. Every effort shall be made to construct the roadway improvements to incorporate "Complete Streets" criteria to the greatest extent practical. Discussions of Kapa'a Quarry Road improvements shall also be in consultation with the State Department of Transportation.

The status of the items under Transportation (a) though (e) are as follows.

UA conditions	Description of UA condition pertaining to Transportation	Status And estimated time of submittal
1. Traffic and transportation related		
1.a	Timeline of project phasing; Initial CMP submitted and accepted	**Approved**
	Timeline of project phasing; Updated in March 2021; awaiting final edits outcome of the FSEIS	Updated report available; est. date May 2021
1.b	Construction Management Plan (CMP) Initial CMP submitted and accepted	**Approved**
	Construction Management Plan (CMP) Updated in March 2021, awaiting final edits outcome of the FSEIS	Updated report available; est. date May 2021
1.c	Traffic Demand Management (TDM)	Updated report available; est. date TBD
1.d	Updated Traffic Impact Assessment Report (TIAR); not commenced yet. Will be carried out after FSEIS is completed and accepted	Not started yet
1.e	Traffic agreement with DPP & DTS; Initial	**Approved**
	Communication with Traffic Review Branch (TRB) has been started and is ongoing	Updated report available; est. date April 2021

Comments:

To 1.a Timeline: The updated timeline has been prepared and will be submittal after the results of the FSEIS are received.

To 1.b CMP: The Draft of the updated Construction Management Plan (CMP) has been completed and the final will be submitted awaiting the outcome of this FSEIS.

To 1.c – TDM: The Draft of the Traffic Demand Management (TDM) report has been completed, and the final will be submitted awaiting the outcome of this FSEIS.

To 1.d – TIAR: The Updated Traffic Impact Assessment Report (TIAR) will be carried out awaiting the outcome of this FSEIS.

T 1.e – Traffic agreement: The initial agreement was accepted by the Traffic Review Branch (TRB) in August 2014. There has been a list of required frontage road improvements which the TRB and the Applicant have agreed upon. The TRB has responded with initial comments and the submittal will be updated.

The scope of the accepted frontage road improvements is illustrated in Figure 2.1. Five frontage road connections A though E along the Kapa'a Quarry Place are listed as locations where or between which frontage roadway improvements are required. Table 2.1 shows the status the frontage roadway improvements.

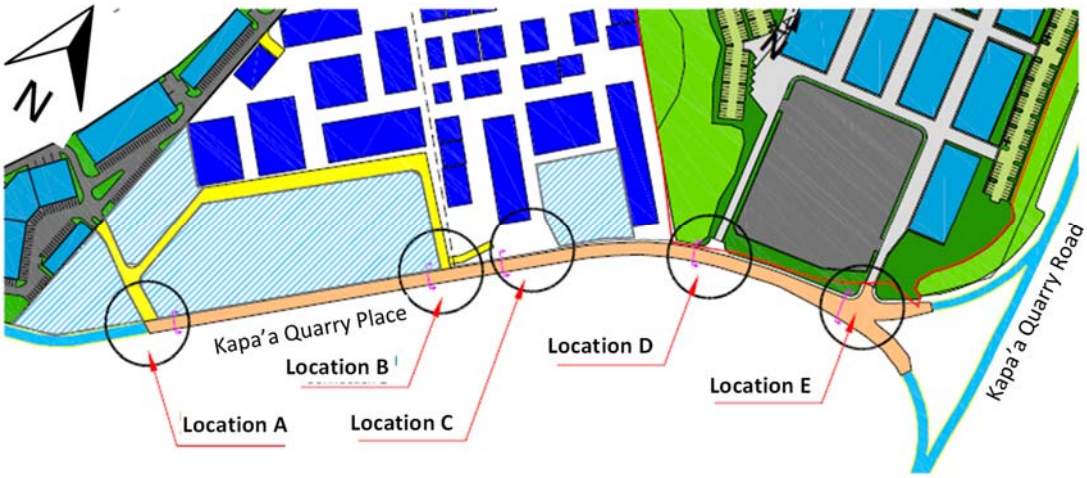
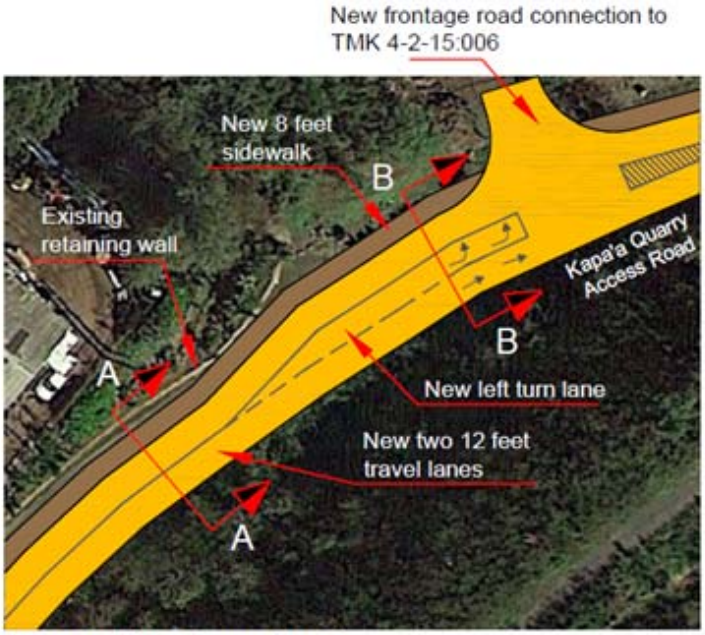


Figure 2.1: Locations on Kapa'a Quarry Place that are identified for required frontage roadway improvements

Table 2.1: Status of Approved Frontage Roadway improvements

Location	Description of agreed upon agreed improvement / modification measures	Status Completed		Notes
West of A	A 2.5-foot sidewalk from a to property boundary of TMK 4-2-15:014	Yes		
West of A	Clearing of several tress to improve sight distance	Yes		
A	Improvement of road access at A	Yes		
Between A and B	Construction of an 8-foot sidewalk with a vegetated buffer next to sidewalk	Yes		
B	Improvement of road access at B	Yes		Was not a requirement but was completed
Between B and D (former D)	Construction of an 8-foot sidewalk with a vegetated buffer next to sidewalk. (Note: new designs of the road accesses to the Lower site)		No	The construction of the sidewalk is planned for the period 2021 through 2023
C	Improvement of road access at C	Yes		Was not a requirement but was completed
D	Improvement of road access at D		No	The design for the road accesses D and to the lower site **have been changed will no longer be built. They are replaced by a single road access.** Communication with TRB is ongoing to define the final design of the single road access.
E	Improvement of road access at E			
Between D and E (former E)	Construction of an 8-foot sidewalk with a vegetated buffer next to sidewalk. (Note: new designs of the road accesses to the Lower site)		No	The sidewalk will be built in conjunction with the construction of the vegetated buffer along the Kapa'a Quarry place

The changes in the frontage roadway improvements described in the SEIS are the road. accesses D and E. Figures 2.2 and 2.3 show the old designs of the road accesses D and E as approved by the DPP, respectively. **Under the new site development plan the road accesses D and E will be replaced by a single road access located on the Kapa'a Quarry Place, between the old road accesses D and E.**



Layout of Frontage Road Connection D

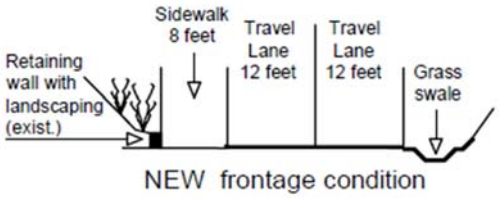
Figure 2.2: Old design of road access D as approved by the DPP.

The basic requirement for the new road accesses was a dedicated left turn lane for the East-bound traffic on Kapa'a Quarry Place.
The concept design of the road access D incorporated the left turn lane.

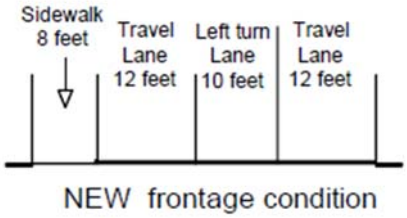
Notes:

- In 2010 the road name "Kapa'a Quarry Access Road" was renamed to Kapa'a Quarry Place.
- In 2017 the parcel TMK 4-2-15:006 was renamed 4-2-15:014 (lower portion of)

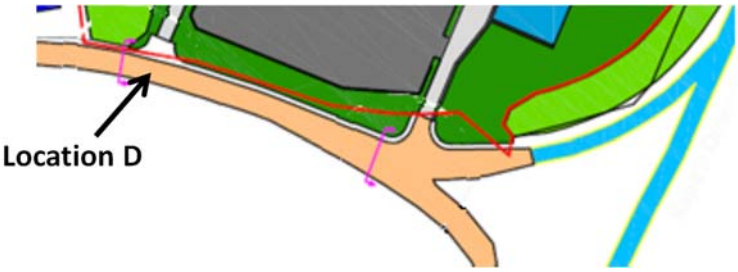
Sections A-A and B-B of the old road access designs are shown below.



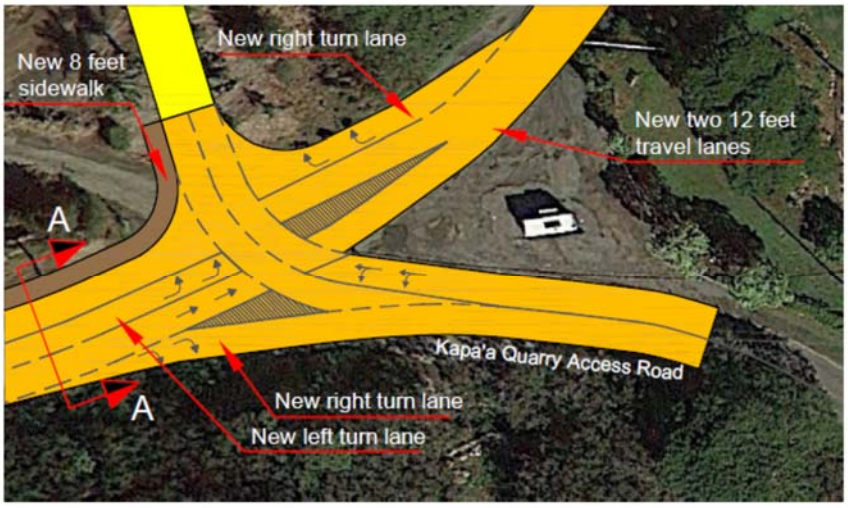
Cross section A-A of old design of road access D



Cross section B-B of old design of road access D



<<< Location of old road access D.



Layout of Frontage Road Connection E

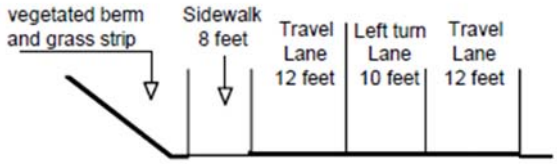
Figure 2.3: Old design of road access E as approved by the DPP

The basic requirement for the new road accesses was a dedicated left turn lane for the East-bound traffic on Kapa'a Quarry Place. The concept design of the road access D incorporated the left turn lane.

Notes:

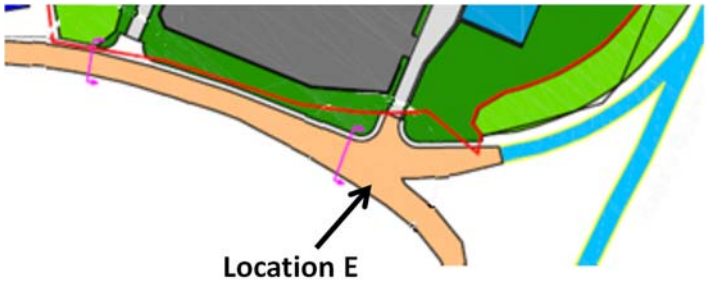
- In 2010 the road name "Kapa'a Quarry Access Road" was renamed to Kapa'a Quarry Place.

Section A-A of the old road access designs is shown below.



NEW frontage condition

<<<< Cross section A-A of old design of road access E



<<< Location of old road access E.

Figures 2.4 and 2.5 show the location and the configuration of the **new design of the single road access to the lower portion of the projects site**. Figure 2.4 shows the location of the new single road access.

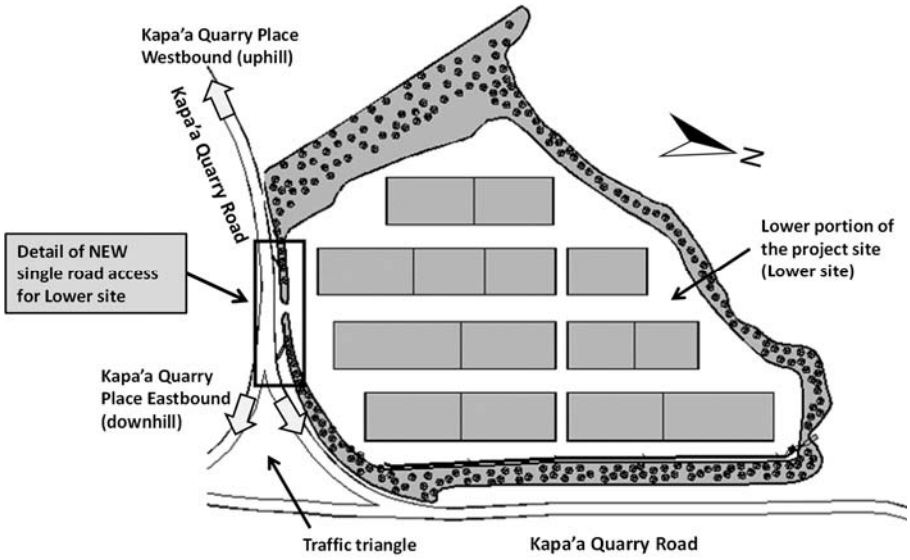
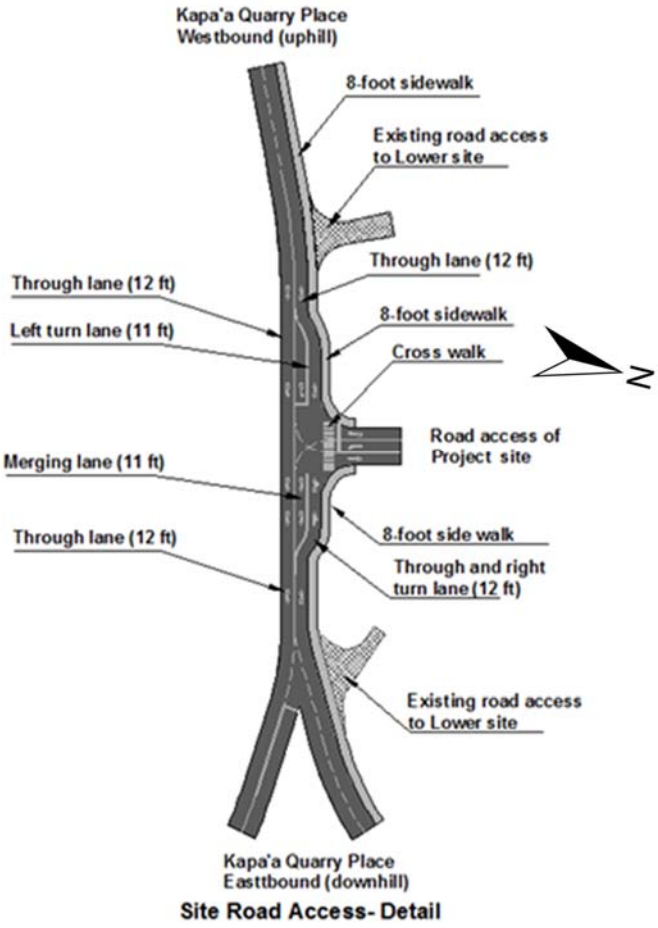


Figure 2.4: Location of the new single road access to the Lower site



<<< Figure 2.4: New design of the single roadway entrance to the Lower site
PRELIMINARY

The review of the proposed single roadway entrance is currently under review at the Department of Planning and Permitting, Transportation Review Branch (TRB).

The initial findings by TRB indicate that the single entrance was accepted to replace the two previously accepted roadway entrances to the Lower site.
The configuration of the intersection for the single roadway entrance to the Lower site shown in Figure 2.4 will need to be modified. The final design of the intersection will be made after the results of a new TIAR are available.
The initial design change would incorporate a dedicated through lane and a dedicated right turn lane for the Westbound traffic on Kapa'a Quarry Place.

SECTION 3 – BUFFER ZONE

The UA condition 2 pertains to Buffer Zone and has the following conditions.

> 2. Buffer Zone. The approximately 29.9 acres of land abutting the zone change area and also within the parcels identified as Tax Map Keys: 4-2-15: 6 and 12 shall remain in the P-2 General Preservation District to serve the purpose of a buffer zone for industrial uses on the Land. The Declarant shall establish and maintain the buffer zone, as required by the DPP, to sufficiently mitigate noise and visual impacts through landscaping that includes earth berms and vegetation that includes tall trees and shrubs. Prior to the issuance of any development permit in the buffer area, the proposed project shall be submitted to the DPP for review and approval to ensure it meets the purpose of the buffer area. The portion of the buffer zone within the parcel identified as Tax Map Key: 4-2-15: 12 contains an existing detention basin which shall be allowed to serve the function of stormwater management for the adjacent zone change area.

Figure 3.1 Defines the zone change areas and the areas abutting the zone change area that remains vegetated land.

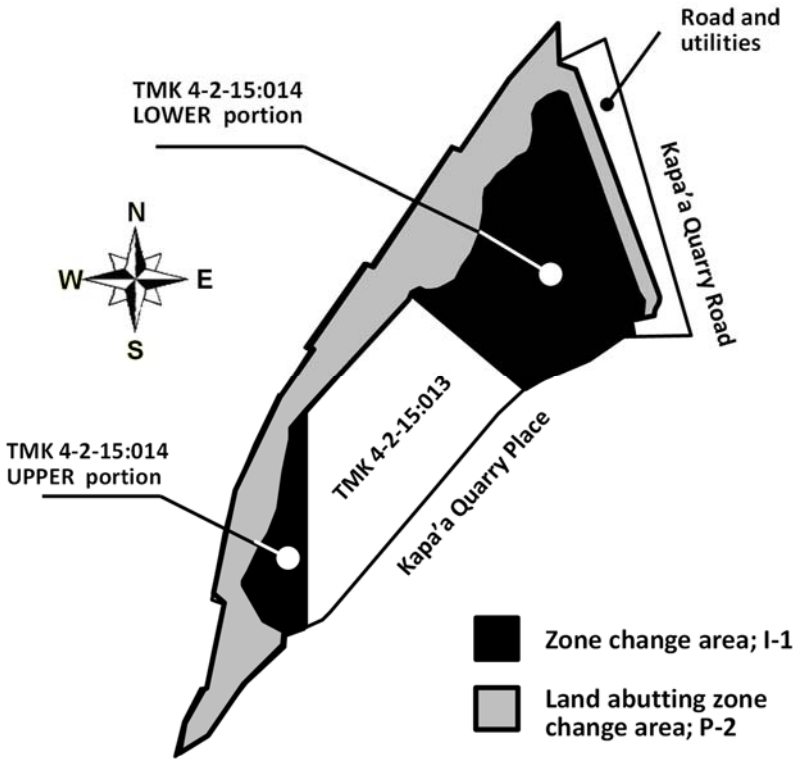


Figure 3.1: Definition of land areas for buffer zone development plans

- The zone change was defined for the former TMK 4-2-15:006 and 012. Which were the lower and upper portions, respectively.
- The new TMK designation is TMK 4-2-15:014, including both the Upper and Lower portions.
- The zone change land encompasses TMK 4-2-15:014.

In Figure 3.1 the land indicated as "Land abutting zone change land" remains vegetated land. This land will have two characteristics; (1) land that remains in the natural vegetated state, and (2) land that will be developed as either landscaped land or restored habitat, with vegetated introduced and maintained.

The land labeled (2) will be at the following locations:

1. At the Western boundary of the zone change land in the **Upper portion** of TMK 4-2-15:014:

   This developed buffer zone around the zone change land has two parts, since development within the Upper portion of TMK 4-2-15:014 occurs in two phases:

   - Phase 1 in the Southern part of the Upper portion (length about 550 feet); this buffer zone has been completed. A representative section for this phase is **U-1.**
   - Phase 2 in the Northern part of the Upper portion (length about 600 feet); this buffer zone is presently under development. A representative section for this phase is **U-2.**

2. Around the entire zone change land in the **Lower portion** of TMK 4-2-15:014 (total length about 4,000 feet)

   This developed buffer zone around the zone change land in the Lower site will have four segments:

   - At the Northern site boundary, the developed buffer zone will separate the site from the Kapa'a Stream corridor. A representative section for this segment of the developed buffer zone is **L-1.**
   - At the Eastern site boundary, the developed buffer zone will separate the site from the Kapa'a Quarry Road. A representative section for this segment of the developed buffer zone is **L-2.**
   - At the Southern site boundary, the developed buffer zone will separate the site from the Kapa'a Quarry Place. A representative section for this segment of the developed buffer zone is **L-3.**
   - At the Western site boundary, the developed buffer zone will separate the site from the existing warehouse development in TMK 4-2-15:013. A representative section for this segment of the developed buffer zone is **L-4.**

Figure 3.2 identifies the locations of the representative cross-section for the Upper and Lower site.

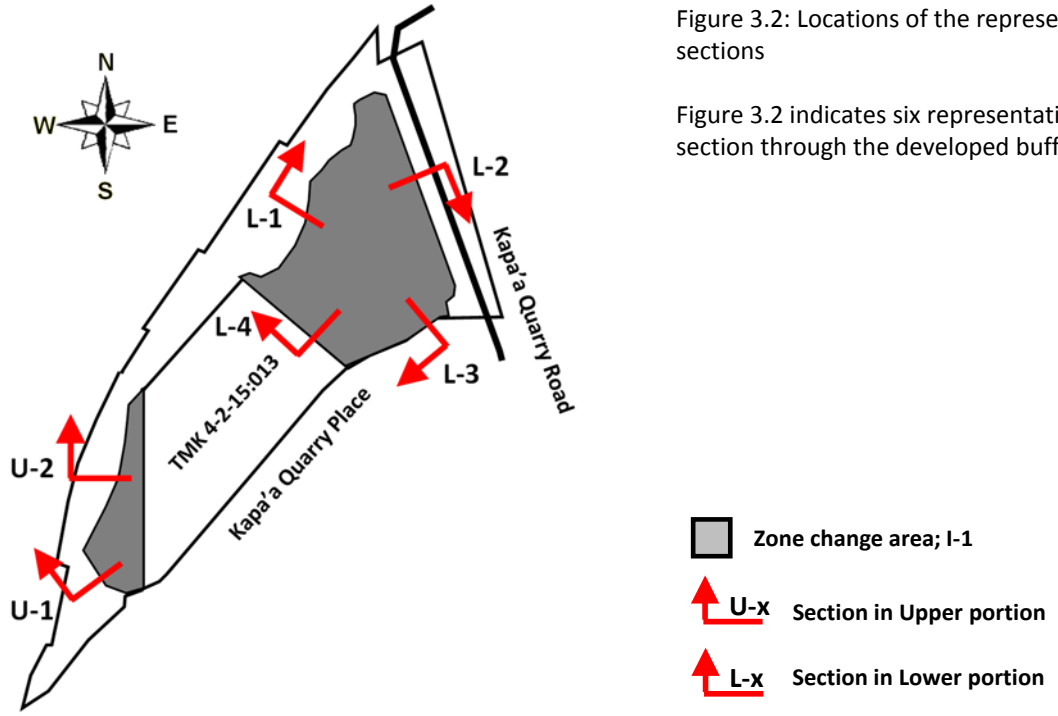


Figure 3.2: Locations of the representative cross-sections

Figure 3.2 indicates six representative cross section through the developed buffer zone.

Figure 3.3 shows the representative cross-section **U-1** for the developed buffer zone for Phase 1, which included the construction of the buildings 50 and 51. The developed buffer strip separates the traffic areas from the existing detention basin, which is to the West of this part of the project site.

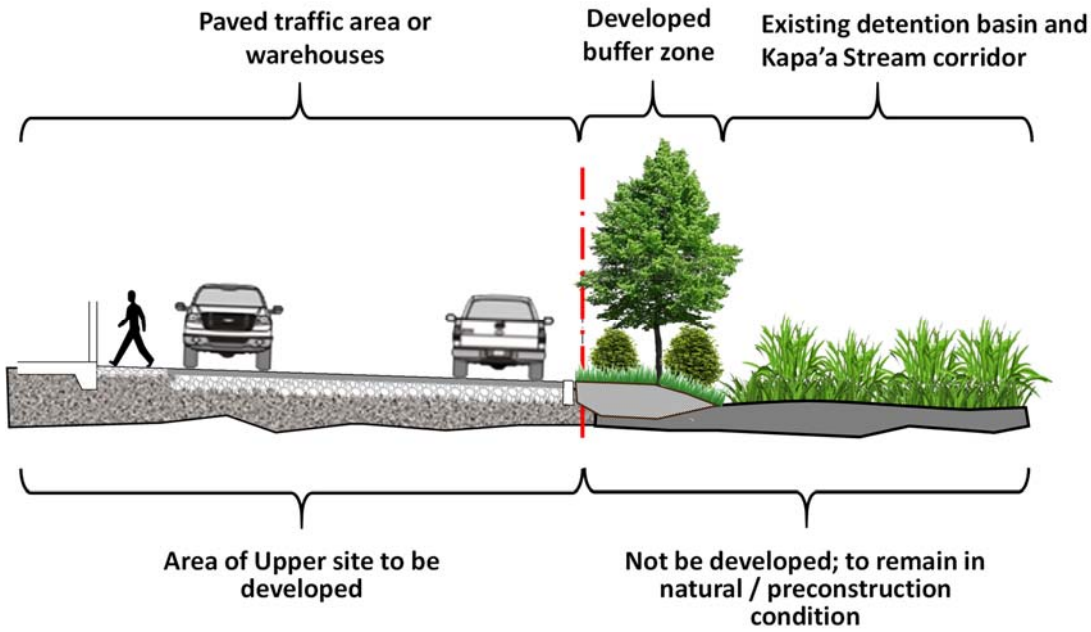


Figure 3.3: Representative cross-section **U-1,** construction completed (not to scale)

Figure 3.4 shows the representative cross-section **U-2** for the developed buffer zone for Phase 2. Phase 2 is presently under construction. The developed buffer strip separates the traffic areas from the existing sloped and densely vegetated perimeter. The developed buffer zone is built as a vegetated buffer strip and serves as a Low Impact Development (LID) storm water treatment measure.

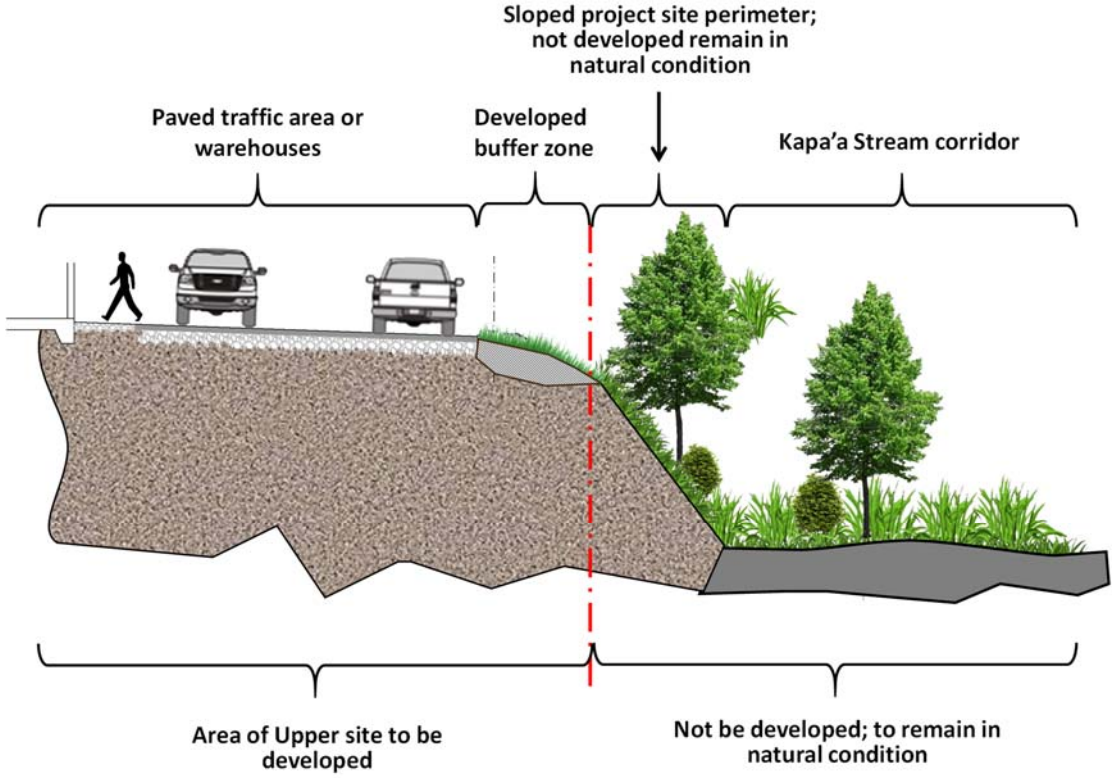


Figure 3.4: Representative cross-section **U-2**, presently under construction (not to scale)

Figure 3.5 shows the representative cross-section **L-1** for the developed buffer zone for the Northern site boundary of the Lower site. The development of the Lower site has not started yet, which includes the construction of the new earth berms on which the vegetated buffer zones will be created. The developed buffer zone separates the paved inner site from the Kapa'a Stream corridor.

Figure 3.6 shows the representative cross-section **L-2** for the developed buffer zone for the Eastern site boundary of the Lower site. The development of the Lower site has not started yet, which includes the construction of the new earth berms on which the vegetated buffer zones will be created. The developed buffer zone separates the paved inner site from the Kapa'a Quarry Road.

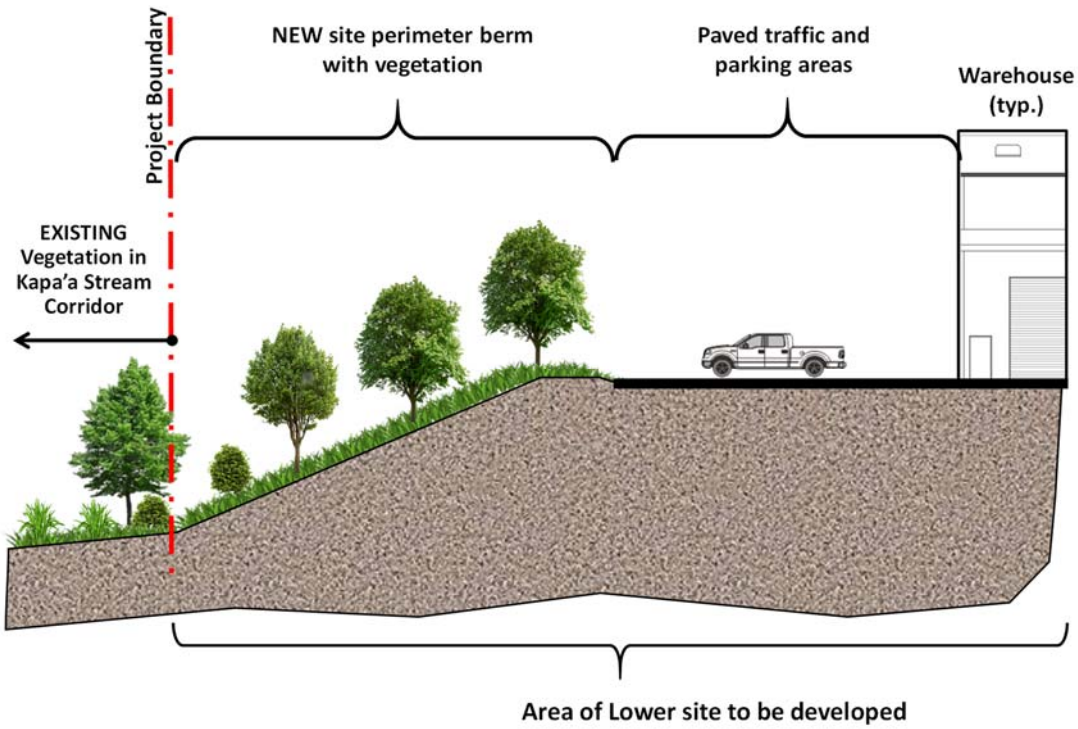


Figure 3.5: Representative cross-section **L-1**, development has not started yet (not to scale)

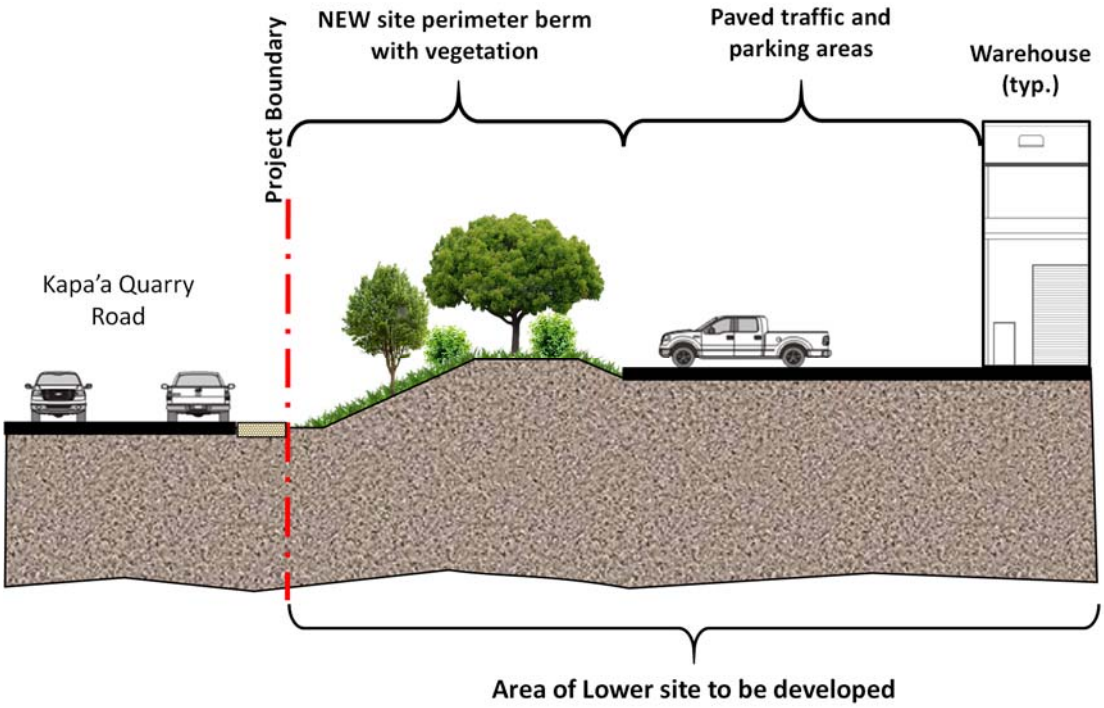


Figure 3.6: Representative cross-section **L-2**, development has not started yet (not to scale)

Figure 3.7 shows the representative cross-section **L-3** for the developed buffer zone for the Southern site boundary of the Lower site. The development of the Lower site has not started yet, which includes the construction of the new earth berms on which the vegetated buffer zones will be created. The developed buffer zone separates the paved inner site from the Kapa'a Quarry Place.

Figure 3.8 shows the representative cross-section **L-4** for the developed buffer zone for the Western site boundary of the Lower site. The development of the Lower site has not started yet, which includes the construction of the new earth berms on which the vegetated buffer zones will be created. The developed buffer zone separates the paved inner site from the existing warehouse development in TMK 4-2-15:013.

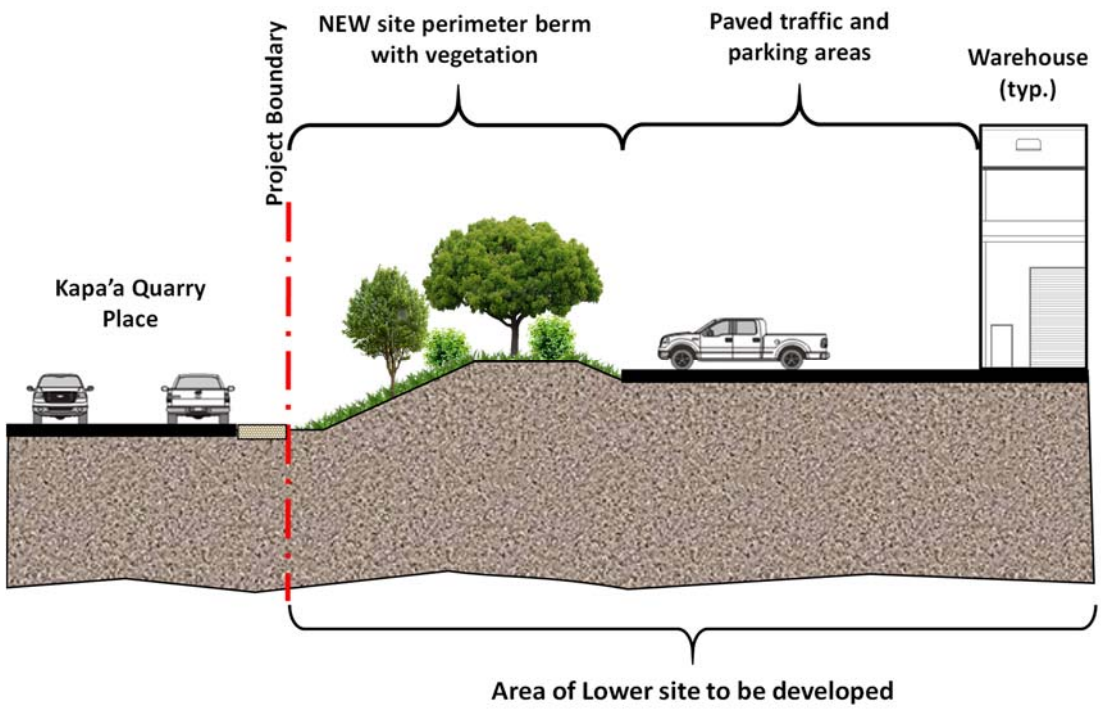


Figure 3.7: Representative cross-section **L-3**, development has not started yet (not to scale)

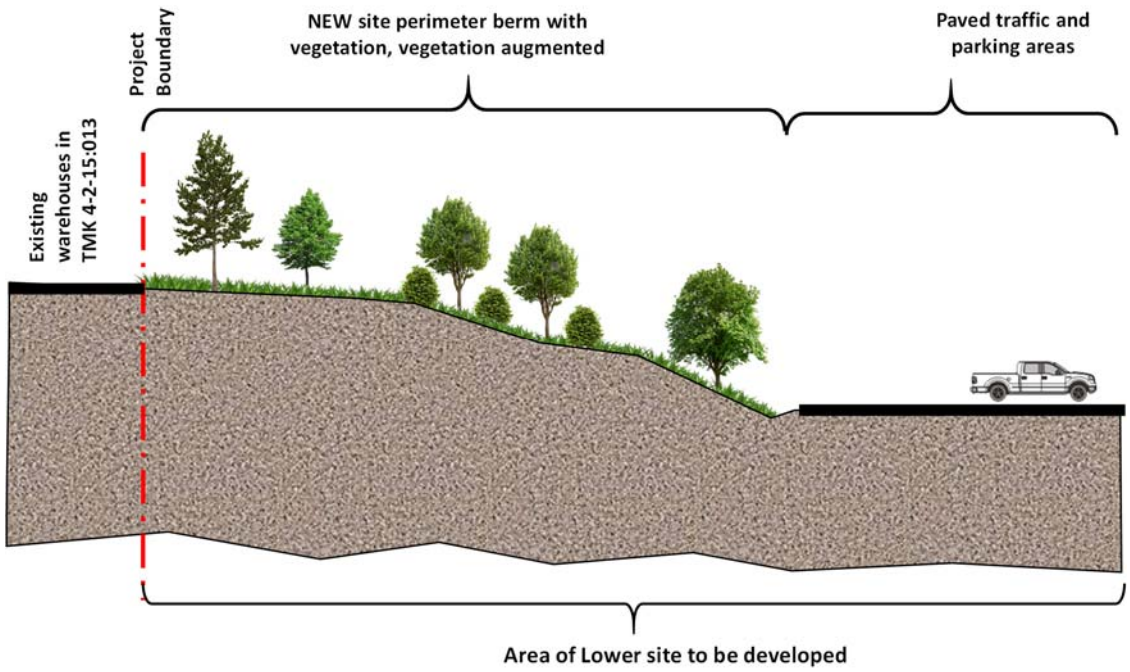


Figure 3.8: Representative cross-section **L-4**, development has not started yet (not to scale)

The existing detention / infiltration basin is located to the West of the Phase 1 development in the Upper portion of the site. Figure 3.9 shows the location of the existing detention / infiltration basin. The basin is presently densely vegetated and used as a Low impact development (LID) storm water treatment zone.

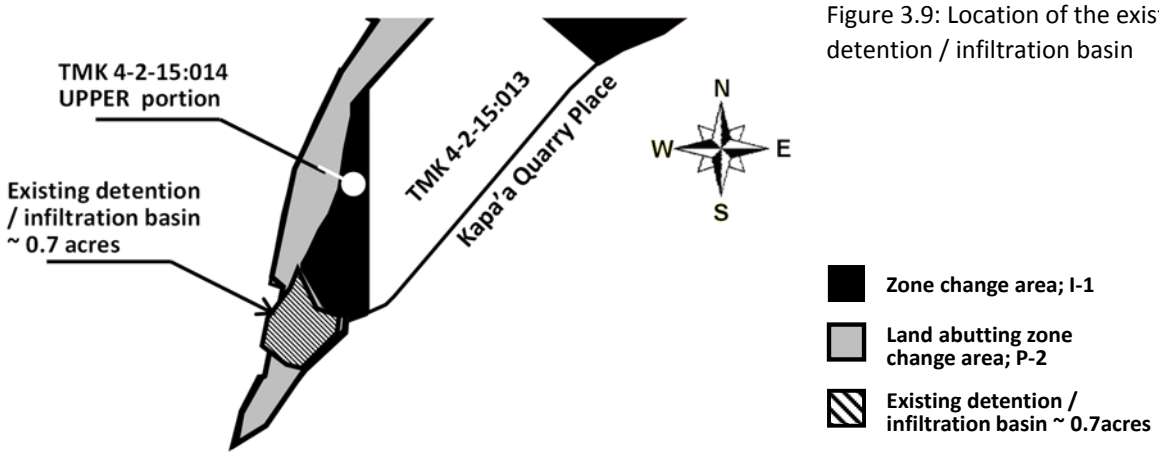


Figure 3.9: Location of the existing detention / infiltration basin

The status of the buffer zone development in the Upper and Lower portions of the site is described in Table 3.1. Table 3.1 also indicates the status of the existing detention / infiltration basin as it was mentioned in the UA as being available for storm water treatment.

Table 3.1: Status of the buffer zone development

UA conditions	Description of UA condition pertaining to Buffer Zone	Status
2. Buffer Zone		
a	Buffer zone development in Upper portion of TMK 42-15:014; Phase 1, Cross-section U-1: The buffer development approach was delineated in the report "Proposed Development Approach of the Buffer Zone adjacent to the rezoned Land in TMK 4-2-15:012". The report described the proposed development of the buffer zone around the former TMK 4-2-15:012. This former TMK 4-2-15:012 has been redesignated to TMK 4-2-15:014 (Upper portion). The proposed buffer zone development is adjacent to building 50. The buffer zone separated the developed area from the existing detention and infiltration basins.	• Design completed: • Construction completed: The report was completed and submitted to DPP in September 2014 before permitting and commencement of construction activities in the former parcel TMK 4-2-15:012.
b	Buffer zone development in Upper portion of TMK 42-15:014; Phase 2, Cross-section U-2: The buffer zone at the site perimeter of Phase 2 will be developed as a vegetated buffer strip that will serve as LID storm water treatment. The configuration of the vegetated buffer strip has described in storm water strategic plan submittals to DPP.	• Design completed: • Construction partially completed: Two stormwater strategic plans have been created and submitted to DPP. The buffer zone approach of using vegetated buffer strip has been approved in conjunction with the storm water permitting.
C	Buffer zone development in the Lower portion of TMK 42-15:014; Cross-sections L-1, L-2, L3 and L-4: In **2016** the initial development approach of building buffer zones around the Lower site has been **approved** by the DPP for a previous layout of the Lower site.	• Design completed: • Construction not commenced yet: In 2016 the initial buffer zone development plan for the Lower site was created submitted and approved by DPP.

Table 3.1: Status of the buffer zone development

UA conditions	Description of UA condition pertaining to Buffer Zone	Status
D	Buffer zone development in the Lower portion of TMK 42-15:014; Cross-sections L-1, L-2, L3 and L-4: In **2020** the layout of the Lower site was changed. The buffer development plan was updated. Besides incorporating the changed layout and Lower site, the updated buffer development plan also incorporates suggested changes by DLNR about the use of native and adapted plants to the buffer zone.	• Design updated: • Construction not commenced yet: In 2020 the updated buffer development plan for the Lower site was completed. The report has been submitted to DLNR.
E	Existing detention / infiltration basin in Upper portion of TMK 4-2-15:014: The UA suggested use of the existing detention / infiltration basin for storm water management and treatment. The existing detention / infiltration basin has been incorporated into the storm water treatment and management system of the Upper site.	• Design completed: • Basin in operation: The use of the basin was approved during permitting for Phase 1 of the Upper portion of TMK 4-2-15:014. A recently submitted storm water strategic plan expanded the use of the existing detention / infiltration basin for the storm water management of an adjacent part of Phase 2 of the Upper portion was approved by DPP.

SECTION 4– STORMWATER FACILITIES

The UA condition 3 pertains to storm water facilities and has the following conditions.

> 3. Stormwater Facilities. The Land shall be subject to the following requirements related to stormwater facility improvements and maintenance, unless otherwise amended by the Director of the DPP:
>
> a. The Declarant shall continue to accept all off-site stormwater drainage onto the Land from the culvert located under Kapa'a Quarry Access Road, which collects runoff from a drainage ditch on the south side of the road, as highlighted in Exhibit C attached hereto and made a part hereof.
>
> b. Development on the lower-elevation portion of the Land, within the parcel identified as Tax Map Key: 4-2-15: 6 (see Exhibit B), shall utilize all of the low impact development approaches for stormwater as described in Appendix E of the zone change application, dated November 2012. These approaches include treating stormwater runoff on site through underground storage containers while avoiding infiltration of rainwater into the existing landfill body. Prior to the issuance of a certificate of occupancy for any building on the lower-elevation portion of the Land, the Declarant shall install stormwater management infrastructure to accommodate the development.
>
> c. The Declarant shall be responsible for monitoring and maintaining all on-site infrastructure for stormwater management, including infrastructure related to item "a" above.

The status of the storm water facilities development in the Upper and Lower portions of the site is described in Table 4.1. Table 4.1 also indicates the status of the existing detention / infiltration basin as it was mentioned in the UA as being available for storm water treatment.

Table 4.1: Status of the storm water facilities development

UA conditions	Description of UA condition pertaining to Storm water facilities	Status
4. Stormwater facilities		
a	Acceptance of off-site storm water drainage onto the Lower site: Before development and initial grading of the Lower site commenced, the off-site drainage was distributed on vegetated and permeable land within the Lower site. Due to the presence of several ponds on the downward trajectory of the off-site drainage, water typically ponded and infiltrated into the existing landfill body. Before the start of initial mass grading within the Lower site the surface runoff pattern of the off-site drainage changed. A large diameter drainpipe was	• Design completed: • Construction completed: In 2019 the drainpipe that conveys the off-site drainage through the Lower site to the Kapa'a Stream corridor was completed.

Table 4.1: Status of the storm water facilities development

UA conditions	Description of UA condition pertaining to Storm water facilities	Status
	installed that conveys the off-site run-off to an armored outfall structure that distributes the off-site runoff into the land of the Kapa'a Stream corridor. Since the off-site drainage comes form an 800-foot vegetated swale, the runoff should have received LID treatment.	
b	Comprehensive storm water treatment and management for the Lower site. All storm water treatment system components required under the UA have been implemented in the design of the Lower site. In addition, several components will be part of the overall storm water strategy which goes beyond the required scope of the storm water system. These additional system components improve the efficacy of the storm water treatment performance. The required avoidance of infiltration into the land fill body and irrigation has been have been implemented in the design. LID storm water treatment was implemented in the storm water system design. Although the requirements for certain higher performance storm water treatment and management system components were limited to the Lower site, some advanced storm water treatment measures are also used in the site design for the Upper portion of the project site. Figures 4.1 and 4.2 illustrate the comprehensive storm water treatment and management systems in the Upper and Lower portions of the project site, respectively.	• Design completed: • Construction not commenced yet: Three strategic storm water plans have been submitted to DPP. All of which have been approved.
C	Maintenance of the storm water system: The owner or operator of the Kapa'a Light Industrial Park (Applicant) will be responsible for the operation and maintenance of the integrated storm water system.	• Temporary maintenance manual completed: • Operation has not yet commenced.

Figures 4.1 and 4.2 illustrate the comprehensive storm water treatment and management systems in the Upper and Lower portions of the project site, respectively.

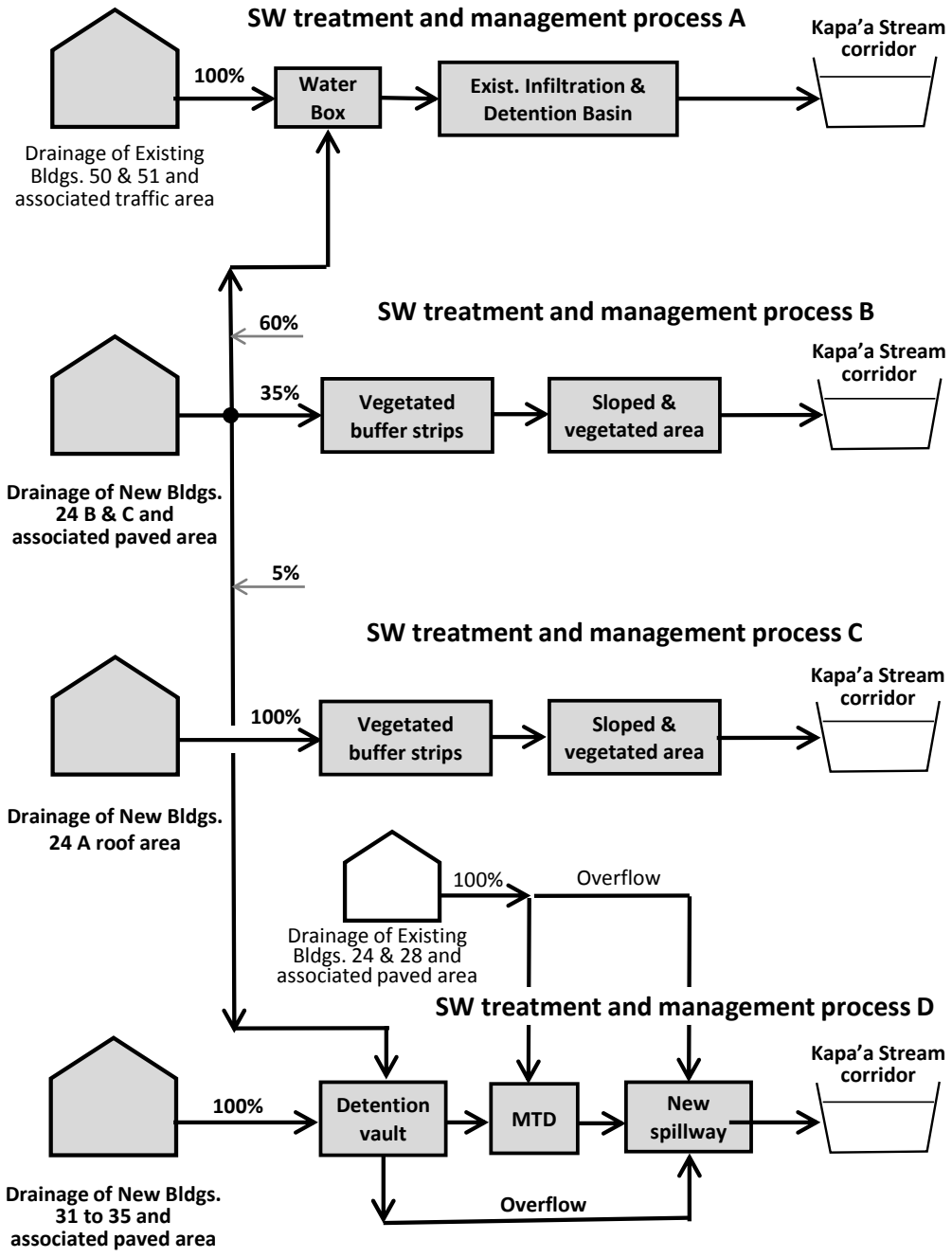


Figure 4.1: Storm water treatment and management system for the Upper portion of the project site

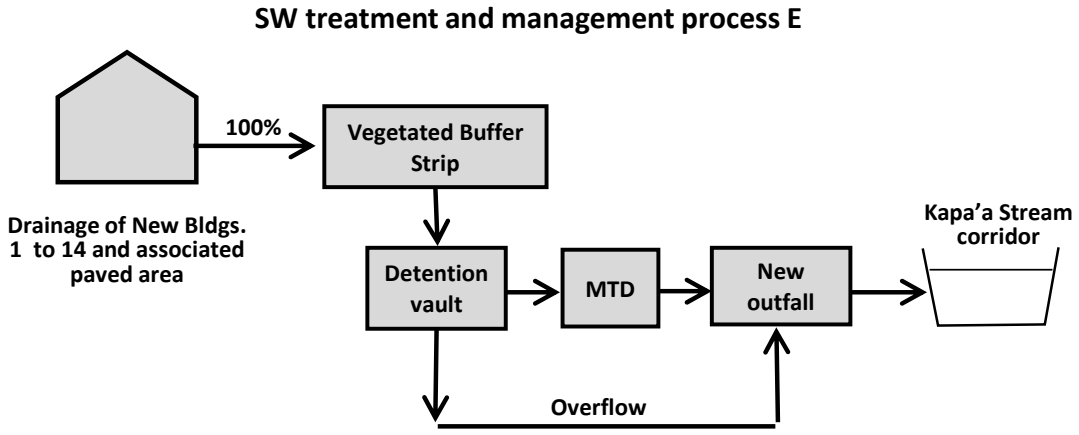


Figure 4.2: Storm water treatment and management system for the Lower portion of the project site

SECTION 5 - EXTERIOR LIGHTING

The UA condition 4 pertains to External Lighting and has the following conditions.

> 4. Exterior Lighting. To mitigate lighting impacts on migrating seabirds, all exterior lighting shall be fully shielded such that light emitted from the fixture is projected below the horizontal plane of the lowest point of the fixture. Prior to the issuance of building permits for the purpose of site development, the Declarant shall submit a conceptual plan for light management to the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife for review and approval, unless the DLNR grants an exemption, in whole or part, from the requirement; and, the Declarant shall thereafter provide the DPP with documentation of approval or exemption. The Plan shall address the proposed location and design scheme of exterior light fixtures as well as light bulb brightness, bulb type, and light color.
>
> Notwithstanding the foregoing, if a Special Management Area Use Permit (SMP) establishes different exterior lighting requirements for the portion of parcel identified as Tax Map Key 4-2-15: 6 that is within the Special Management Area, the SMP lighting requirements shall prevail in that area.

The status of the use exterior lighting in the Lower portions of the site is described in Table 5.1.

Table 5.1: Status of the exterior lighting development

UA conditions	Description of UA condition pertaining to Exterior Lighting	Status
5. Exterior lighting		
a	Acceptance of Exterior Lighting plan: The report "Proposed Concept Plan for Exterior Lighting in Lower Part of the Light Industrial Park" was **accepted** by DLNR and DPP in 2016. The report delineated the use of external lighting in the Lower site. The report proposed to use different types of light fixtures (e.g., different color rendering) such as low-pressure sodium lamps for traffic safety and LED for limit use at loading docks and other locations. Lamps with narrower light spectrums have less detrimental effects on wildlife. The Lower site is within the Special Management Area and is next to environmentally sensitive land.	• Design completed: • Construction not commenced yet: The report and the proposed measures to minimize light pollution were approved by DLNR and DPP.

Table 5.1: Status of the exterior lighting development

UA conditions	Description of UA condition pertaining to Exterior Lighting	Status
	The report specified shielding requirements and other properties which make light fixtures more environmentally friendly.	
b	Updated report: "Proposed Concept Plan for Exterior Lighting"; the updated report incorporates the new site layout. The basic assumptions and approaches of the initial 2016 report, which were approved in 2016, were not changed.	The updated report was completed and included all approved light pollution mitigation measures.

SECTION 6 – COMPLIANCE WITH GOVERNMENTAL REGULATIONS

The UA condition 5 pertains to Governmental Regulations and has the following conditions.

> 5. Compliance with Other Governmental Requirements. The Declarant acknowledges that approval of this zone change does not constitute compliance with other LUO or other governmental requirements. They are subject to separate review and approval. The Declarant shall be responsible for ensuring that the final plans for the Project comply with all applicable LUO and other governmental provisions and requirements.

In addition to the conditions delineated in Sections 2 through 5, the following LUO and other governmental provisions and requirements apply to the development. Table 6.1 shows the status of compliance achieved and issues outstanding, which have not been addressed in Sections 2 through 5.

Abbreviations used hereafter:

- NPDES National Pollutant Discharge Elimination System
- NPDES NOI Notice of intent (under NPDES to achieve general permit coverage)
- NPDES NGPC Notice of general permit coverage.
- NPDES NOC notice of cessation
- SMP Special management Area Use permit

Table 6.1: LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)

UA conditions	Description of UA condition pertaining to governmental provisions and requirements	Status
6. LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)		
1	**Storm water discharge permits under NPDES**	
Overview	NPDES permit authorizing discharges of storm water associated with construction activities (HAR 11-115, Appendix C)	Several NPDES general permit coverages for construction activities have been obtained for different phases of the project. Typically, these phases are groups of associated buildings, where the construction area is larger than one acre or a masterplan for the development phases has been created.

Table 6.1: LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)

UA conditions	Description of UA condition pertaining to governmental provisions and requirements	Status
	NPDES general permits for construction activities were obtained for the following phases / development sections:	
A	Zone change land in the Upper portion of TMK 4-2-15:014, Phase 1, Southern portion	NPDES NGPC was obtained for the 2.1-acre site; after the construction activities were completed a Notice of cessation was NPDES NOC filed. The construction related BMPs have been removed
B	Zone change land in the Upper portion of TMK 4-2-15:014, Phase 2, Northern portion	NPDES NOI has been filed for the 2.3-acre site; no construction activities have commenced yet
C	Land in TMK 4-2-15:013 (not included in zone change land but inside the project site), new buildings 31 through 35	NPDES NGPC was obtained for the 4.0-acre project site; construction of one building (No. 31) has been completed; construction of one building (32) is in progress; construction for the remaining three buildings is planned for 2021 through 2022
D	Zone change land in the Lower portion of TMK 4-2-15:014	NPDES NGPC was obtained for the 25-acre site; some grading has been done; final mass grading has not started yet; construction of buildings and traffic area has not started
E	As of 2017 for the Upper portion of the project site (entire Upper portion of TMK 4-2-15:014 and entire 4-2-15:013) two NPDES No exposure certifications (NEC) have been obtained to comply with the NPDES for storm water associated with industrial activities (HAR 11-115, Appendix B).	The NPDES No exposure certifications (NEC) cover all buildings in the upper portion except the buildings that are presently under or have just completed construction - Bldgs. 24A and 31.
2	Special Management Area Use Permit (SMP)	
A	A Special Management Area Use Permit (SMP) (Major) was required to start with the development of the Lower site.	The SMP (Major) was obtained in September 2014 (Resolution 14-222, CD1)

Table 6.1: LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)

UA conditions	Description of UA condition pertaining to governmental provisions and requirements	Status
	Development included initial grading of the site.	
B	A Minor Modification for SMP No. 2014/SMA-27 was required since stockpiling was initially not included in the permitted uses of the SMA areas. Stockpiling of a significant amount of fill was required to commence the first phase of grading. Since grading work was done in phases, fill that was brought to the site was first stored until sufficient fill was accumulated for the phased grading work to commence.	The Minor Modification for SMP No. 2014/SMA-27, identified as 2016/MOD-68 (NA), was obtained to allow stockpiling in conjunction with grading.
C	A further Minor Modification for SMP No. 2014/SMA-27 was required to allow a redesigned storm water management system. The original storm water management system under the approved SMP No. 2014/SMA27 had an underground detention basin which would detain and subsequently release storm water in controlled above-ground discharges to receiving waters. The redesigned storm water system would replace the approved storm water system with a low impact development infiltration system.	Minor Modification for SMP No. 2014/SMA-27, identified as 2017/MOD-37 (MT), was obtained in 2019.
D	In 2019 a further Minor Modification for SMP No. 2014/SMA-27 was required to allow a modified storm water treatment system. The approved storm water treatment and management system under 2017/MOD-37 (MT) included an infiltration vault upstream of the Eastern site perimeter berm. The storm water would be captured and detained in the infiltration vault and subsequently allowed to infiltrate	The application for minor modification was denied and the acceptance of a Supplemental EIS was made a condition for processing of the Minor modification.

Table 6.1: LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)

UA conditions	Description of UA condition pertaining to governmental provisions and requirements	Status
	from the vault into the adjacent landfill body. The infiltrated storm water would then migrate underneath the site perimeter berm and be captured in the drainage canal adjacent to the Kapa'a Quarry Road. A geological engineering report stated that infiltration of larger quantities of storm water upstream and adjacent to the earth berms of the site perimeter could cause berm instabilities and associated berm failures.	
3	Joint Development Agreement for the entire area of the Kapa'a Light Industrial Park	
	A joint development agreement was required to jointly construct and operate infrastructure facilities that crosses the property boundaries of the three land parcels TMKs 4-2-15:006, 008 and 012. These three land parcels made up the Kapa'a Light Industrial Park. The joint development also was required to construct buildings across property lines.	In 2015 the Joint Development Agreement Conditional Use Permit (CUP) No. 2015/CUP-70 was obtained.
4	Changes of land parcel designation.	
	In 2016, a Subdivision of three parcels and creation of two lots was initiated to satisfy an administrative act proposed by the City and County of Honolulu.	In 2016 the DPP approved a subdivision of the parcels that comprise the KLIP into two lots, Lot 1 of 22.3 acres and Lot 2 of 56.9 acres. The previous TMK 4-2-15:008 was designated Lot 1 and the two TMKs 42-155:006 and 012 were designated Lot 2. New TMK designations were subsequently assigned with TMK 4-2-15:008 changing to 4-2-15:013, and TMKs 4-2-15:006 and 012 changing to 4-2-15:14.

Table 6.1: LUO and other governmental provisions and requirements (not mentioned in Sections 2 through 5)

UA conditions	Description of UA condition pertaining to governmental provisions and requirements	Status
5	Other minor permits were obtained for the construction and renovation (modification) off warehouses and warehouse space. These included:	

SECTION 7 – ANNUAL REPORTS

The UA condition 6 pertains to Annual Reports and has the following conditions.

> 6. Annual Reports. On an annual basis, the Declarant shall submit a written status report to the DPP documenting its satisfaction and/or describing its progress toward complying with each condition of approval for this zone change. This status report shall be submitted to the DPP by December 31 of each year until such time as the DPP has determined that all conditions of approval have been satisfied. Failure to do so may result in delays in processing of further permits.

Annual reports were provided to the DPP for five consecutive years. The annual report will be resumed at the end of 2021.

For the years between the submittals of the report, Appendix K is submitted.

SECTION 8 – NONCOMPLIANCE OR FAILURE TO UA CHANGE CONDITIONS

The UA condition 7 pertains to Noncompliance or Failure to Fulfill Any Conditions and has the following conditions.

> 7. Noncompliance or Failure to Fulfill Any Conditions. In the event of noncompliance or failure to fulfill any of the conditions set forth herein, the Director of the DPP shall inform the Council and may institute action to terminate or stop the project until applicable conditions are met. Noncompliance also may be grounds for revocation of the permits issued under this zone change. Noncompliance also may be grounds for the enactment of ordinances making further zone changes, including revocation of the underlying zoning, upon initiation by the proper parties in accordance with the Revised City Charter.

The Applicant has been and will be compliant with all conditions delineated in the Unilateral Agreement of the Conditional Zone Change (City and County of Honolulu, ORDINANCE 13—35).

Appendix L:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

OPTIONS FOR RELOCATION OF POWER LINES OVER LOWER SITE (NEW APPENDIX)

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For Activities to Develop the

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Final

Appendix L

Review of Relocating a Section of the 4 kV Kapa'a Power Line Supplying the Kapa'a Light Industrial Park (KLIP)

April 2021

Sustainable Design & Consulting LLC
Practical Sustainability

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ABBREVIATION

FSEIS	Final Supplemental Environmental Impact Statement
KLIP	Kapa'a Light Industrial Park (KLIP)
HECO	Hawaiian Electric Company
Lower site	Lower site of the KLIP, within the lower portion of TMK 4-2-15:014
Mauka	Inland or toward the mountain
Makai	Toward the ocean

Units

kV	Kilo Volts

EXECUTIVE SUMMARY

This Appendix L of the Final SEIS describes the proposed relocation of the 4kkV power line that supplies the Kapa'a Light Industrial Park (KLIP). A 900-foot section of the existing power line passes through the lower site of the KLIP (Lower site). The existing power line was constructed in 1970 and has not changed since then.

The presence of the power line obstructs the development of the Lower site. The section of the power line that passes through the Lower site needs to be removed, and the missing section needs to be rerouted to a location outside the development footprint of the Lower site. This will place the new section of the power line, subsequently referred to as the 4 kV Kapa'a power line, outside the project boundary of the KLIP development in the Lower site.

In a 1970 agreement the Hawaiian Electric Company (HECO) committed to relocate the power line if the Lower site would be developed. The Applicant and HECO have started the design for the power line relocation project, which is subsequently referred to as the Proposed Action.

This Appendix L describes the background of the proposed Action and identified four initial alternative alignments of the 4 kV Kapa'a power line.

The four initial alternatives were as follows:

- No-action Alternative: This would leave the existing power line in its existing position, which would significantly interfere with the proposed development of the Lower site.
- Alternative A: This alignment alternative would connect the relocated section of the power line to same pole of the combined 46 kV and 4 kV power line ("combined power line") which runs parallel to the H3-Freeway, outside of the Lower site. From the connection pole, the new 4 kV Kapa'a power line would first cross the Kapa'a Stream corridor in Eastern direction and then run Southward along the foot of the new site perimeter berm of the Lower site of KLIP to an existing pole, were it would connect to existing wiring.
- Alternative B: This alignment alternative would connect to a different pole of the combined power line and then run Southward along the foot of the new site perimeter berm of the Lower site of KLIP to an existing pole, were it would connect to existing wiring. Alternative B would run Southward on the Mauka (Western) side of Kapa'a Quarry Road.
- Alternative C: This alignment alternative would connect to a different pole of the combined power line and the run Southward along the Kapa'a Quarry Road on the Makai (Eastern) side of the roadway to an existing pole, were it would connect to existing wiring.

An initial determination concluded that the No-action would be eliminated. Also, an initial determination of the expected impact was performed for construction activities inside the Kapa'a Stream corridor and the wetland areas. The fact that heavy equipment would have to access the wetland suggested that Alternative A should not be further considered.

For the remaining Alternatives B and C, a ranking procedure was performed that determined the benefits and impacts of both alternatives. The ranking criterial quantified the overall performance based

on 11 criteria, which included ease of construction as well as expected effects on short-term and long-term impacts. The results of the ranking suggested that both Alternatives B and C could both be considered. The final selection of what alternative to use will be made by responsible County agencies, in cooperation with HECO and the Applicant.

Expected impacts to the environment and the community of the Alternatives B and C are described, and possible mitigation measures were described.

SECTION 1 - INTRODUCTION

Section 1 describes the Proposed Action and the need to implement the Proposed Action.

1.1. Purpose and Need for Action

At the present time, the project site is supplied with electricity through a 4 kV power line that connects to a 4 kV power line which runs along the H3 Freeway.

The existing alignment of the 4 kV Kapa'a power line which supplies the project site with electricity (4 kV Kapa'a power line) and passes through the Lower site is shown in Figure 1.1.1. The Kapa'a 4 kV power line connects to an existing power line at the pole that is indicated as "A". From pole A, the Kapa'a 4 kV power line crosses the Lower site to a point where it intersects the Eastern site perimeter. From this point the Kapa'a 4 kV power line runs to the pole B. The Kapa'a 4 kV power line continues from pole B to run Westwards along the Kapa'a Quarry Place towards the existing warehouse development in TMK 4-2-15:013 and 014 (upper portion of).

The approximately 1,400-foot section of the Kapa'a 4 kV power line which needs to be rerouted runs between pole A and pole B. (dashed line in Figure 1.1.1)The existing Kapa'a 4 kV power line will stay in operation until a new alignment will be installed that bypasses the section from A to B. The new alignment of the Kapa'a 4 kV power line will run outside the buffer zone, and thus outside the site perimeter berms.

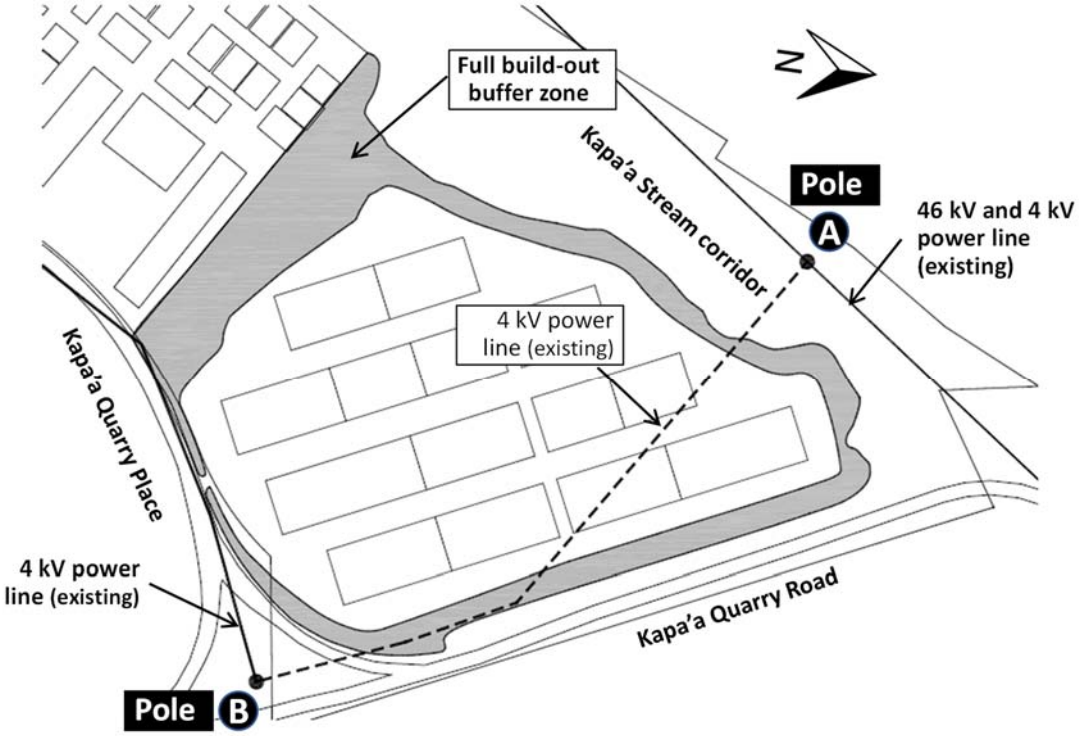


Figure 1.1.1: Existing Kapa'a 4 kV power line (this Figure has been added to the DSEIS; refer to Appendix L)

Figures 1.1.3 through 1.1.6 show close-up views of the existing Kapa'a 4 kV power line. Figure 1.1.2 indicates the locations and directions of the viewpoints.

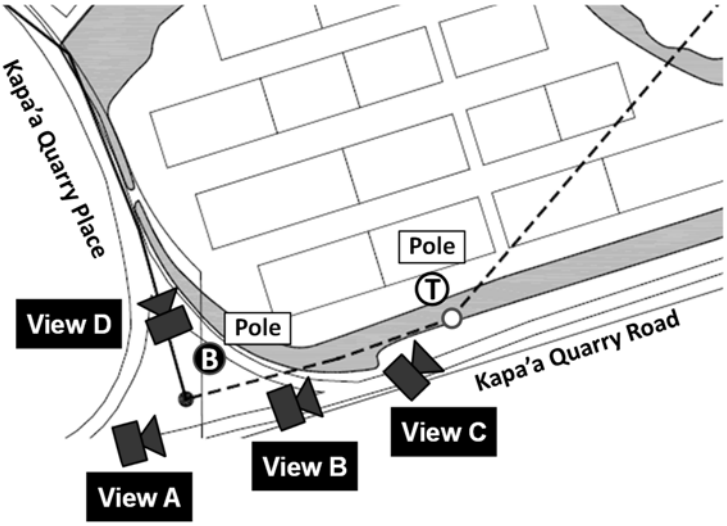


Figure 1.1.2: Views of the existing Kapa'a 4 kV power line

The indicated camera positions A through D show the locations and direction of the viewpoints shown in Figure 6.10.1.3 through 6.10.1.6

(this figure was added to the DSEIS; refer to Appendix L)

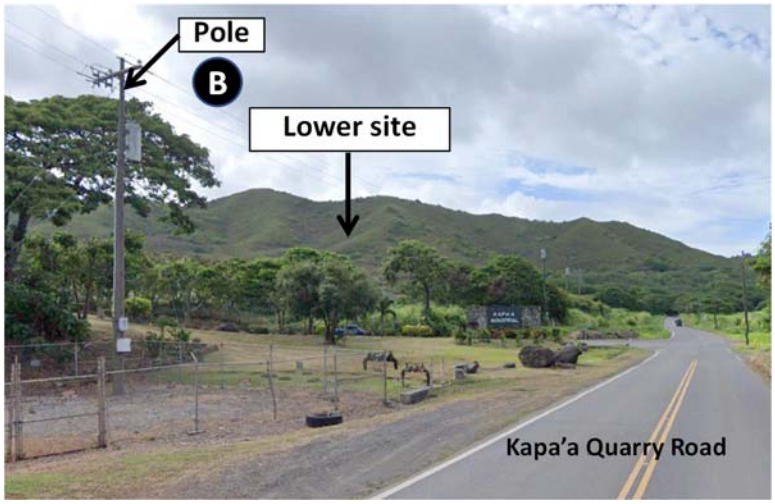


Figure 1.1.3: View A of the existing Kapa'a 4 kV power line

The view is to the North along the Kapa'a Quarry Road. The Pole B is readily accessible.

(this figure was added to the DSEIS; refer to Appendix L)

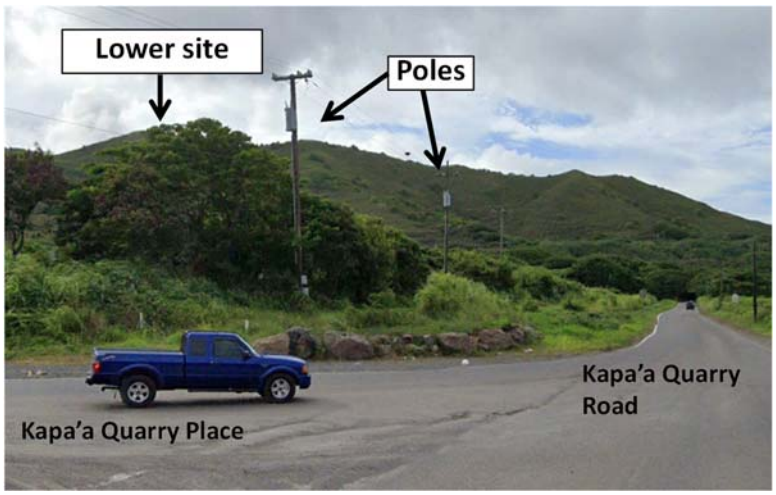


Figure 1.1.4: View B of the existing Kapa'a 4 kV power line

There are two intermediate poles between the Pole "B" and "T".

(this figure was added to the DSEIS; refer to Appendix L)

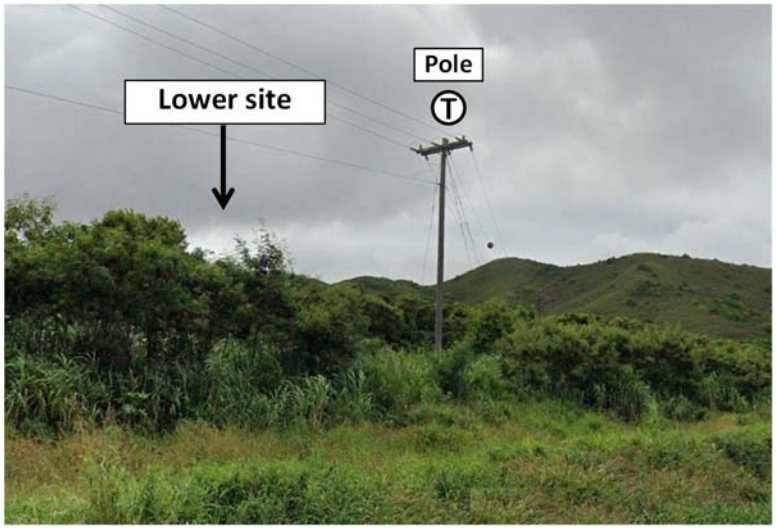


Figure 1.1.5: View C of the existing Kapa'a 4 kV power line

The Pole T is the point where the alignment of the 4 kV Kapa'a power line changes direction from parallel to the Kapa'a Quarry Road to passing over the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

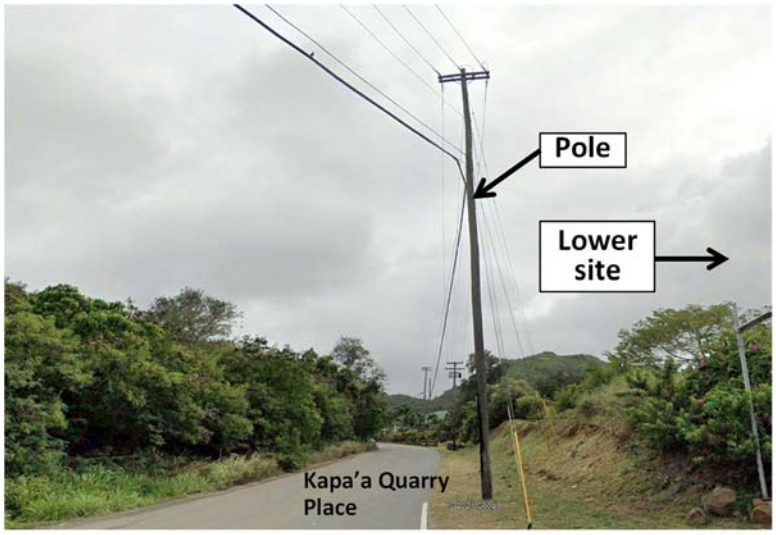


Figure 1.1.6: View D of the existing Kapa'a 4 kV power line

The portion of the 4 kV Kapa'a power line to the West of Pole B will basically remain the same. The pole indicated in the foreground will have to be moved by approximately 50 feet to make space for the new road entrance to the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

1.2. Proposed Action

The proposed action is the rerouting of the alignment of the Kapa'a 4 kV Kapa'a power line that presently runs through the Lower site. The new alignment of the Kapa'a 4 kV Kapa'a power line will be installed outside the Lower site of a length of approximately 1,800 feet.

1.3. Objective of Proposed Action

The objectives of the proposed action are:

- Design, install and maintain a bypass of the section of the 4 kV Kapa'a power line that presently passes through the Lower site so that the development of the Lower site can commence.
- Consider future expansion of the Kapa'a Light Industrial Park (KLIP) in sizing the power supply to the site, so that any upgrades in capacity and technology of the 4 kV Kapa'a power line can considered.
- Mitigate environmental impacts by choosing the option which is most beneficial yet sustainable.

1.4. Scope of Proposed Action

The scope of the proposed action is as follows:

- Retain the section of the 4 kV Kapa'a power line that presently passes through the Lower site to allow the development of the Lower site.
- Install a section of the Kapa'a 4 kW that will be located between the two connection points of the section that will be removed, by implementing the following actions:
  - Identify a new alignment of the section of the Kapa'a 4 kW power line in such a way that the new alignment and associated construction work causes the least impact on the environment and the community.
  - Select appropriate impact mitigation measures for the construction and subsequent maintenance of the new section of the Kapa'a 4 kW power line.
  - Carry out the construction work new alignment of the section of the Kapa'a 4 kW by following all impact mitigation processes as identified.
- Upon completion of the installation of the new section of the 4 kV Kapa'a power line, disconnect the existing section that passes through the Lower site from the take-over-points and connect the new section.
- Remove the section of the 4 kV Kapa'a power line that is presently passes through the Lower site.

1.5 Considerations that Affect Alternatives

With the need to relocate the power line established, the decision must be made which alignment should be used.

SECTION 2 - EXISTING CONDITIONS

Section 2 describes the existing conditions at the project site where the relocation of the 4 kV Kapa'a power line will take place.

2.1 Project Site

Figure 2.1.1 shows the vicinity map of the lower portion of the project site, with parcel information indicated. The lower portion of the project site is within TMK 4-2-15:014.

The figure shows the alignment to an existing power line in the vicinity of the project site, which run in the South-West direction. This power line carries conductor of two different substation supplies, one at 43 kV and the other at 4 kV (combined power line). Coming from the North-East, the combined power line passes through TMK 4-2-17:020 (State of Hawaii owned) and TMK 4-2-15:014 (Owned by KLIP) before entering the land of the Intestate H-3 (John A. Burns Freeway).

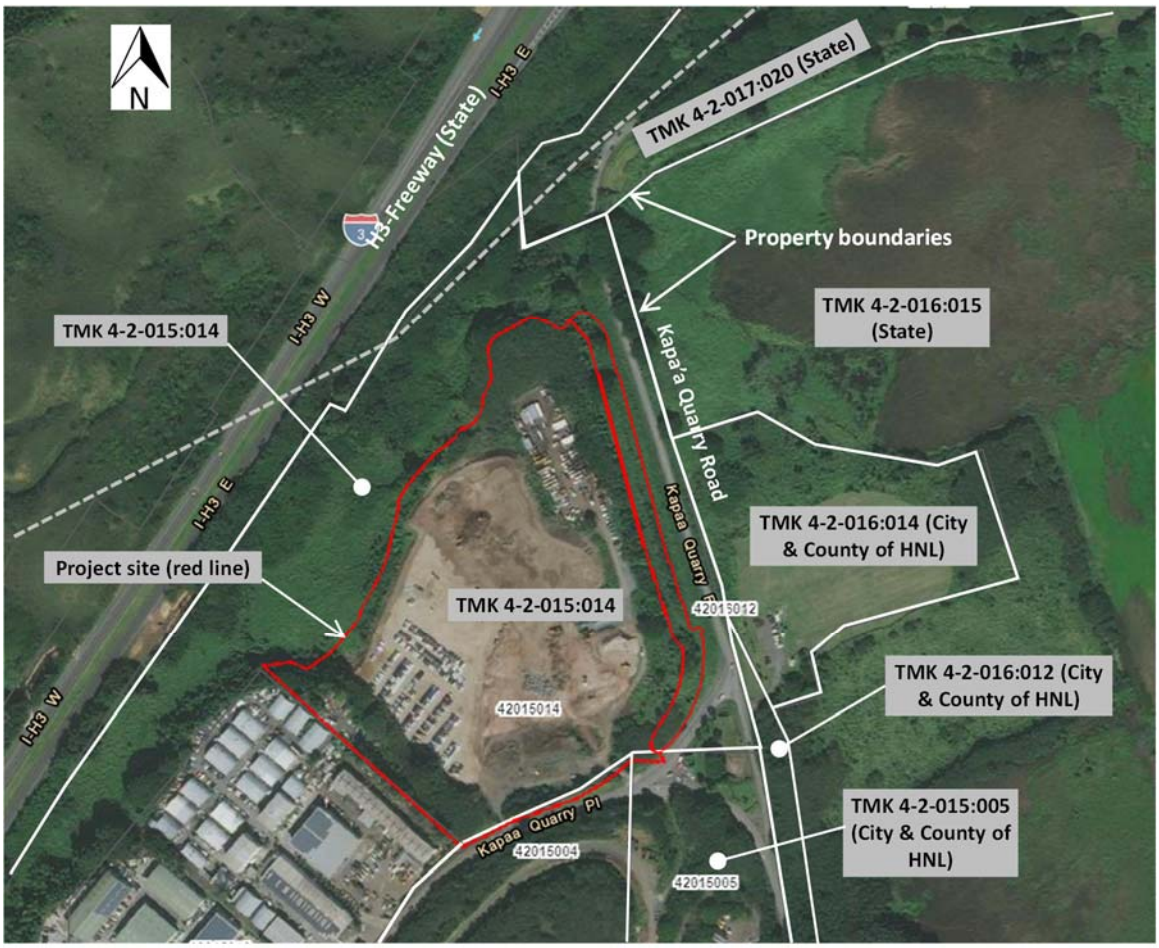


Figure 2.1.1: Vicinity map with parcel information indicated

Figure 2.1.2 describes the project site, which is the lower portion of the KLIP, within TMK 4-2-15:014, and adjacent areas. The project site includes the Lower site, with a 23 acres zoned Limited Industrial (I-1) and 1.8 acres zoned General Preservation (P-2). Furthermore, the project site also includes open space within TMK 4-2-15:014 outside of the Lower site and a small portion the TMK 4-2-17:020, which is owned by the State of Hawaii (refer to Figure 2.1.1). Two poles of the combined power line are indicated, one within the State owned TMK 4-2-17:020 parcel and the second within TMK 4-2-15:014.

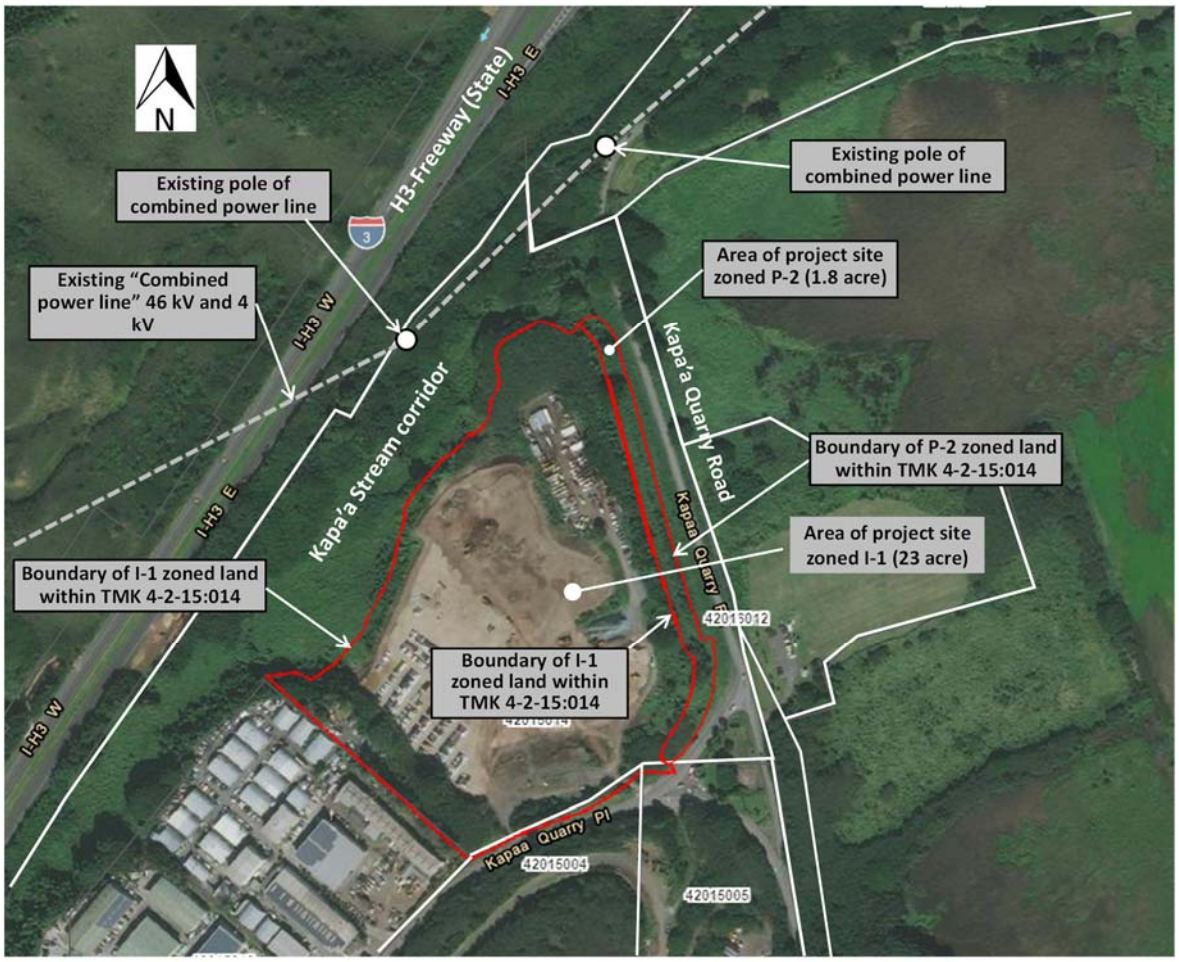


Figure 2.1.2: Project site description

Figure 2.1.3 indicates the existing alignment of the 4 kV Kapa'a power. The 4 kV Kapa'a power line alignment presently passes through the project site. The 4 kV Kapa'a power line connects to the combined powerline at an existing pole.

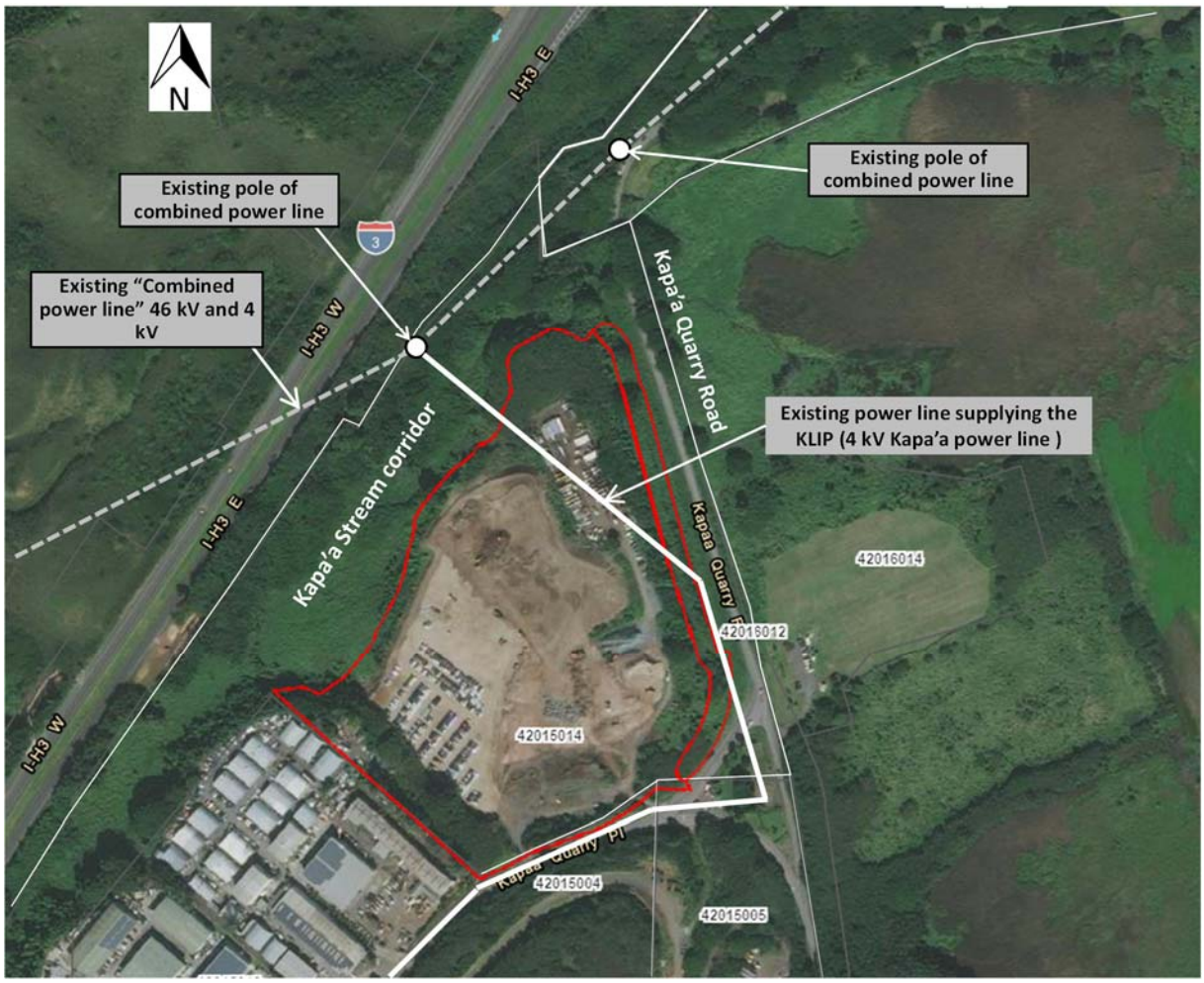


Figure 2.1.3: Existing alignment of the 4 kV power line supplying the KLIP (4 kV Kapa'a power line)

The development of the project site requires the relocation of the section of the existing 4 kV Kapa'a power line which passes through the Lower site to an alignment that runs outside the project site.

Three alternative alignments of the powerline, A, B, and C have been identified which can be installed outside the boundaries of the project site. These three alternatives are described in the next sections.

SECTION 3 - ALTERNATIVES FOR PROPOSED ACTION

3.1. Introduction

This section describes the different alternative alignments which have been considered for the section of the 4 kV Kapa'a power line which bypasses the present section passing over the Lower site.

3.2. Alternatives Considered

There are three alternatives which have been considered, in addition to the No-Action alternative. Figure 3.2.1 illustrates the four alternatives.

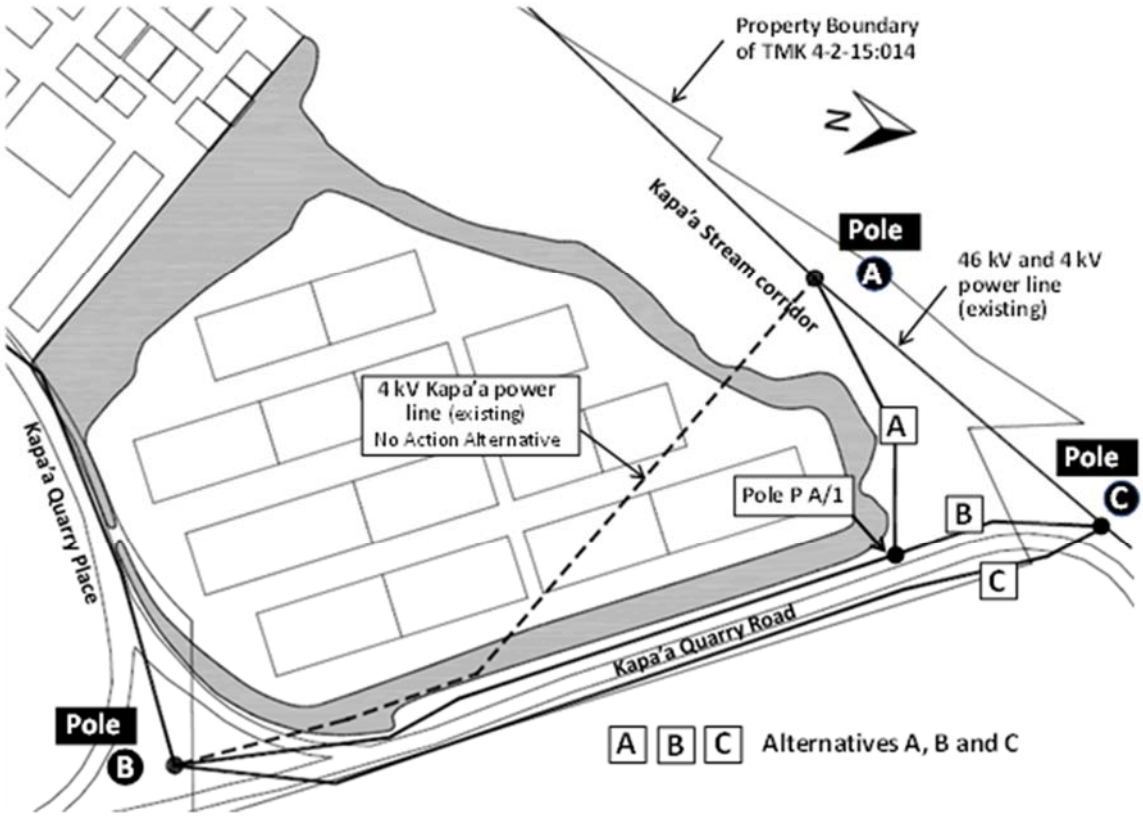


Figure 3.2.1: Alternative alignments A, B and C of the 4 kV Kapa'a power line to Pole B

As described in the FSEIS, the No Action Alternative was ruled out. Failure to relocate the 4 kV Kapa'a power line would make it impossible to implement the development of the Lower site, including the proposed impact mitigation measures.

The alternatives A through C are described in detail in the following section2.

3.2.1 Alternative Alignment A

Under Alternative A, the 4 kV Kapa'a power line would connect to the Pole A as the existing 4 kV power line outside the Lower site, as shown in Figure 3.2.1. This means that Alternative A of the 4 kW Kapa'a

power line would connect to the same Pole A as the existing 4 kV Kapa'a power line. Pole A holds the combined power line that passes the project site on the North.

Figure 3.2.1.1 shows an overview of Alternative A. The first segment of the Alternative A alignment would run from the existing pole of the combined power line to the East, crossing the Kapa'a Stream corridor. The first segment would be entirely within TMK 4-2-15:014, owned by the Applicant. The second segment of the 4 kV Kapa'a power line would run South along the Eastern site boundary, within TMK 4-2-15:014, and end at an existing pole, within TMK 4-2-15:005, which is owned by the City & County of Honolulu. The length of the powerline inside TMK 4-2-15:005 would be approximately 100 feet.

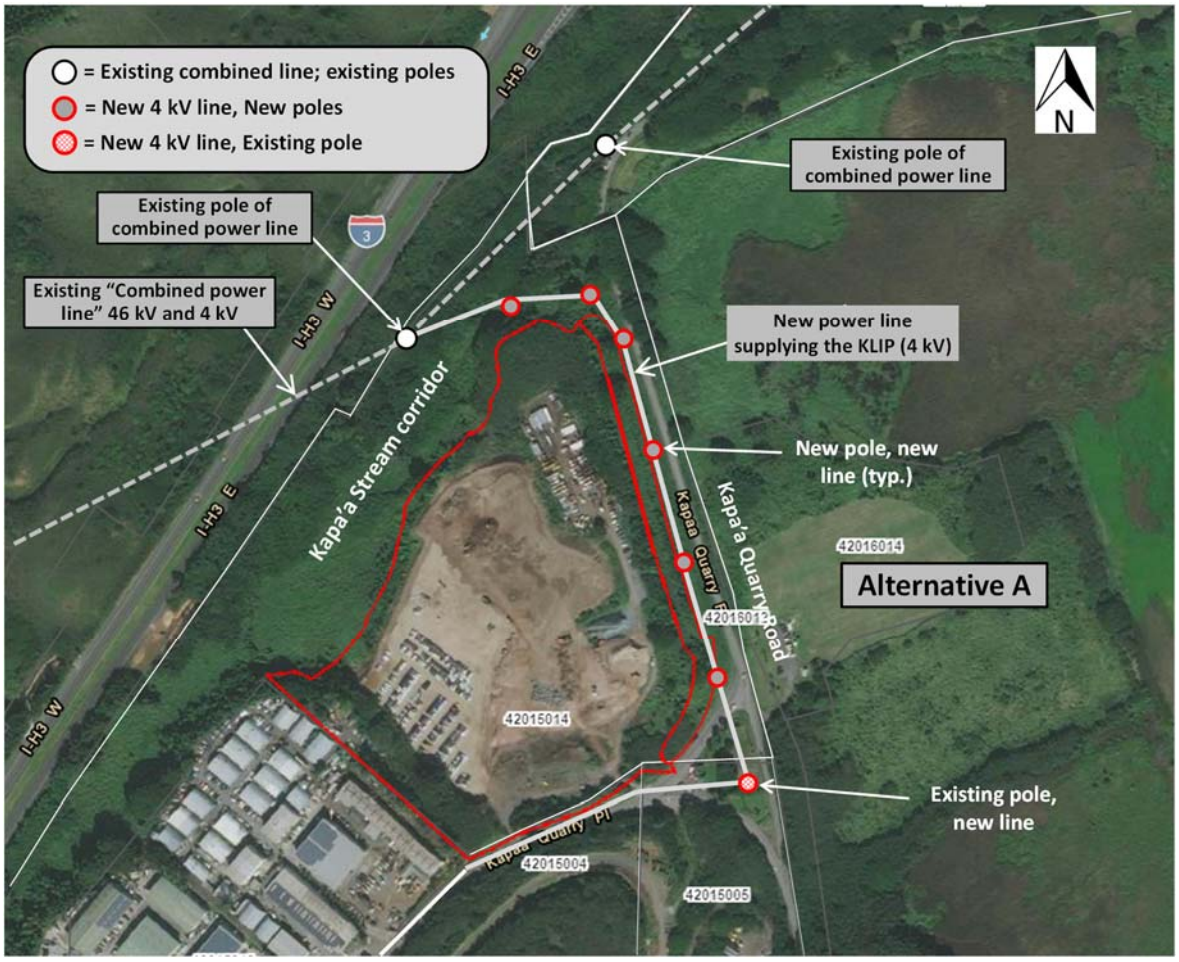


Figure 3.2.1.1: Alternative A alignment of the New 4 kV Kapa'a power line section supplying the KLIP

Figure 3.2.1.2 shows details of the Alternative A alignment in the vicinity of the Kapa'a Stream corridor. The first segment of the 4 kV Kapa'a would start at the existing pole of the combined power line, labeled P M/1, and run for about 550 feet Eastwards to a new pole, labeled P A/1. The first segment would have one intermediate pole, labeled P 1/1. The second segment starts at pole P A/1 and runs South.

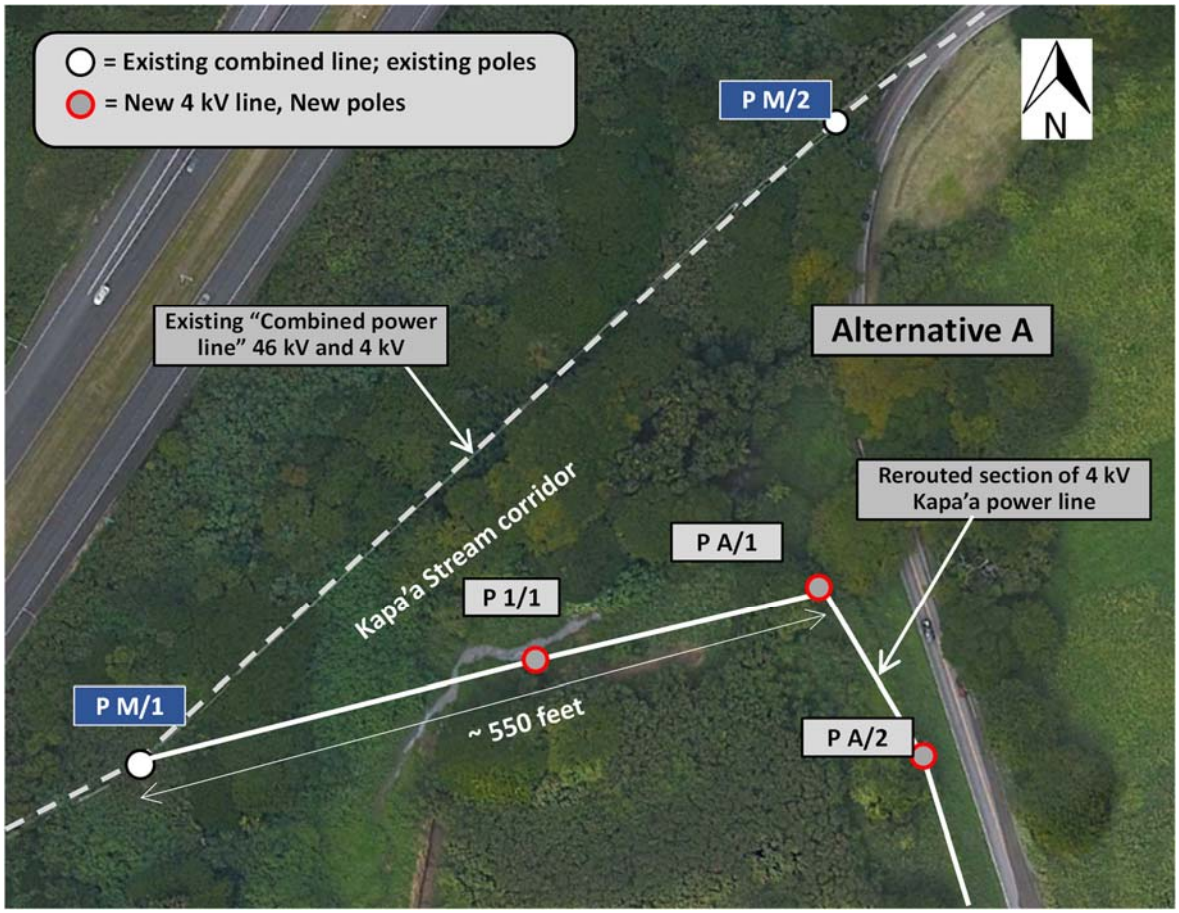
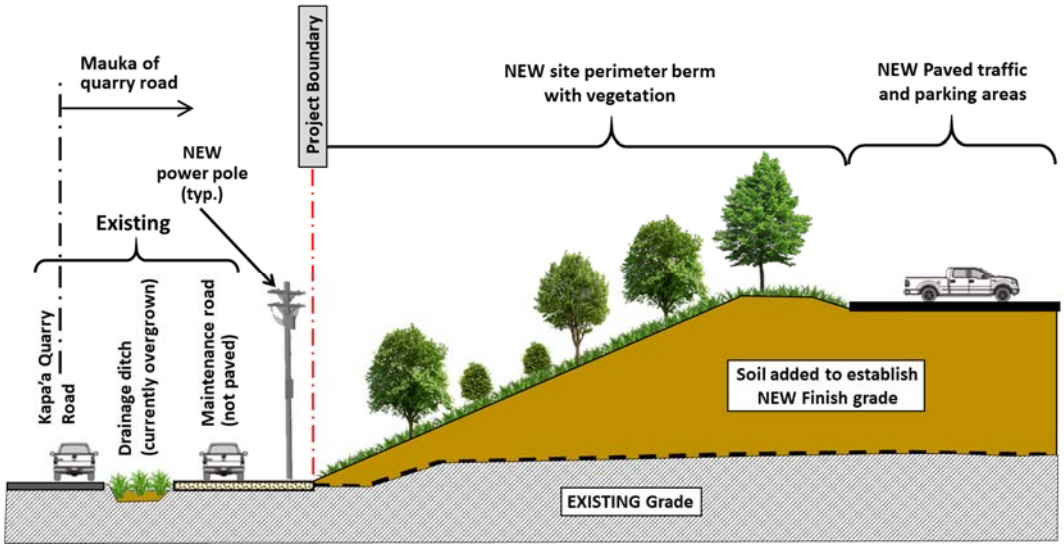


Figure 3.2.1.2: Detail of Alternative A alignment of the New 4 kV power line

Figure 3.2.1.3 and 3.2.1.4 show typical cross sections of the Alternative A alignment.

Figure 3.2.1.3 shows a representative cross section of the Alternative A new powerline within a segment running Southward along the Eastern boundary of the Lower site. The figure illustrates that the new poles of the 4 kV Kapa'a power line would be installed at the project boundary. Installation of the poles could be readily carried out from the existing maintenance road.

Figure 3.2.1.4 shows a representative cross section of Alternative A new power line within segment running Eastward along the Northern boundary of the Lower project site. The figure illustrates that the new pole P 1/1 of the 4 kV Kapa'a power line would be installed at or close to the project boundary. Figure 7.2. shows the finish grade with the new vegetation on the perimeter berm added.



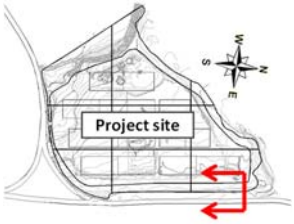
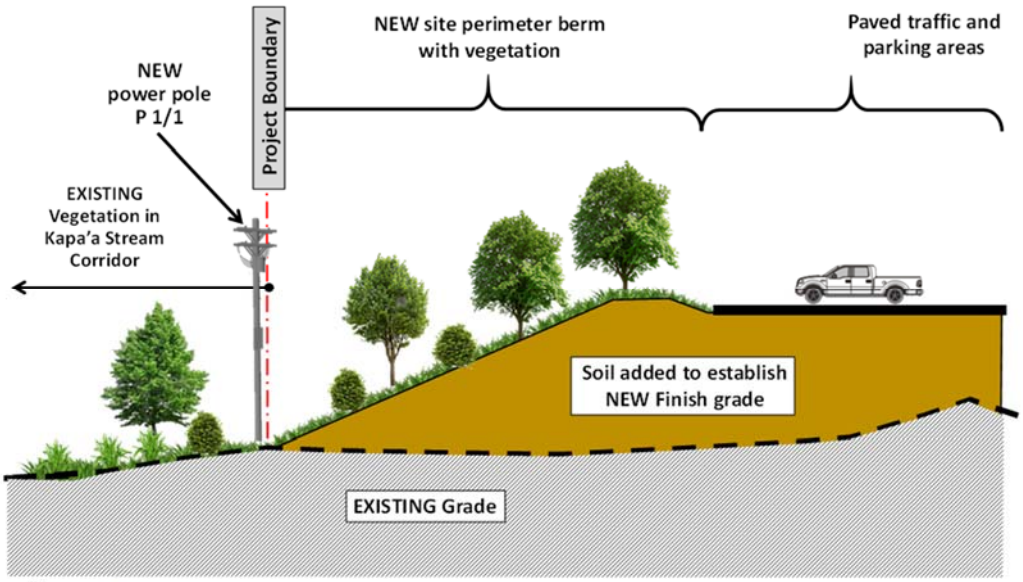


Figure 3.2.1.3: Representative cross section at the Eastern project boundary.

<<<< The location of the cross section is indicated in the overview map on the left side.



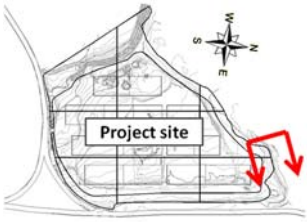


Figure 3.2.1.4: Representative cross section at the Northern project boundary.

<<<< The location of the cross section is indicated in the overview map on the left.

For the installation of new pole P 1/1 under the Alternative A alignment there are two possible construction scenarios. Figure 3.2.1.5 illustrates the present condition of the site grade. Initial grading of the site is ongoing under an existing grading permit. While the present temporary grade has not reached the elevation of the finish grade, there is a certain horizontal distance between the future location of pole P 1/1 and the location on the site from where equipment could reach the future P 1/1 location. There are two possible installation scenarios for pole P 1/1:

- Under Construction scenario 1, installation of pole P 1/1 would occur from the edge of the existing site grade. Some quantity of fill has been added under an existing grading permit and a temporary sloped area at the boundaries of the existing grading areas has been established. Under this Construction scenario 1, heavy installation equipment would not have to enter the Kapa'a Stream corridor. Feasibility of Construction scenario 1 would depend on the reach of the heavy equipment to install pole P 1/1. The required reach of a crane to place the pole could be up to 60 feet.
- Under construction scenario 2 installation of pole P 1/1 would occur from within the Kapa'a Stream corridor. Therefore, it would be necessary to bring some heavy construction equipment into the Kapa'a Quarry corridor.

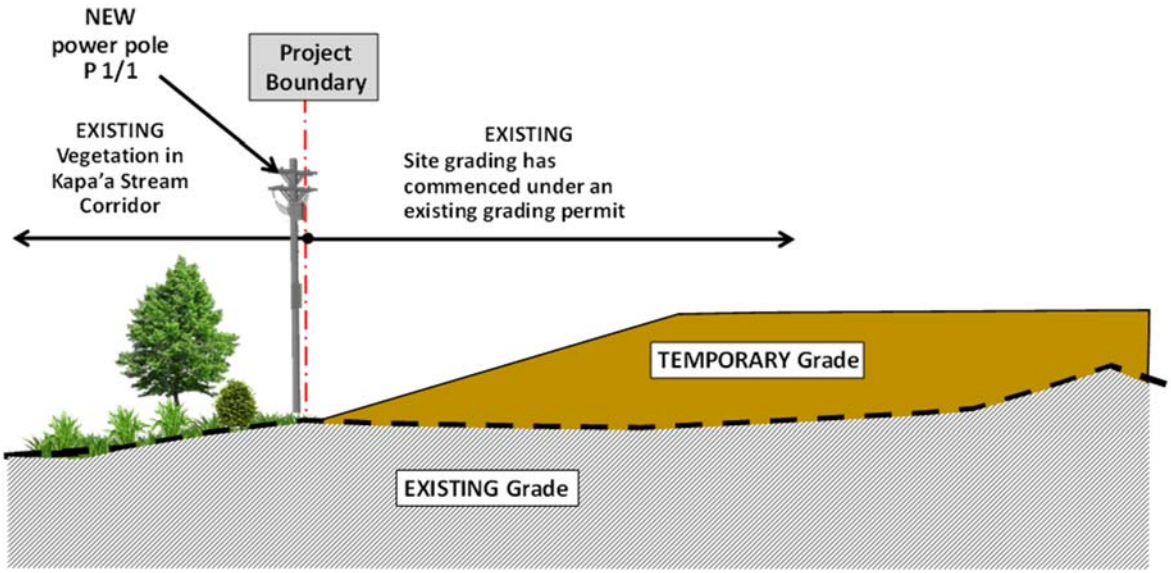


Figure 3.2.1.5 : Representative cross section at the Northern project boundary, showing temporary grade

Under the Alternative A alignment, the construction would occur under two existing project conditions:

- The pole installation related work would be conducted exclusively within TMK 4-2-15:014, thus land that is owned by the Kapa'a I, LLC.
- The final connection of the conductor from the last pole within TMK 4-2-15:014 to pole B, within TMK 4-2-15:005 (owned by the City & County), would occur under an existing easement.

3.2.2 Alternative Alignment B

Under the Alternative B alignment, the new section of the 4 kV Kapa'a power line would connect to an existing pole of combined power line that would be different than under Alternative A, as shown in Figure 3.2.2.1. Alternative B alignment of the 4 kV Kapa'a power line would start at the existing pole of the combined power line and run South outside the project site, along the **Mauka side** of the Kapa'a Quarry Road. The first segment of the Alternative B alignment would run from the existing pole of the combined power line to the South, crossing the Kapa'a Stream corridor adjacent to the Kapa'a Stream drainage culvert under the Kapa'a Quarry Road. The first 280-foot segment would be evenly spilt entirely between TMK 4-2-17:020, owned by the State, and 4-2-15:014, owned by the Applicant. The second segment would run South along the Eastern boundary of the Lower site, within TMK 4-2-15:014, and end at an existing pole, within TMK 4-2-15:005 owned by the City & County of Honolulu. The length of the powerline inside TMK 4-2-15:005 would be approximately 100 feet.

Figure 3.2.2.2. shows detail of the Alternative B alignment in the vicinity of the Kapa'a Stream corridor.

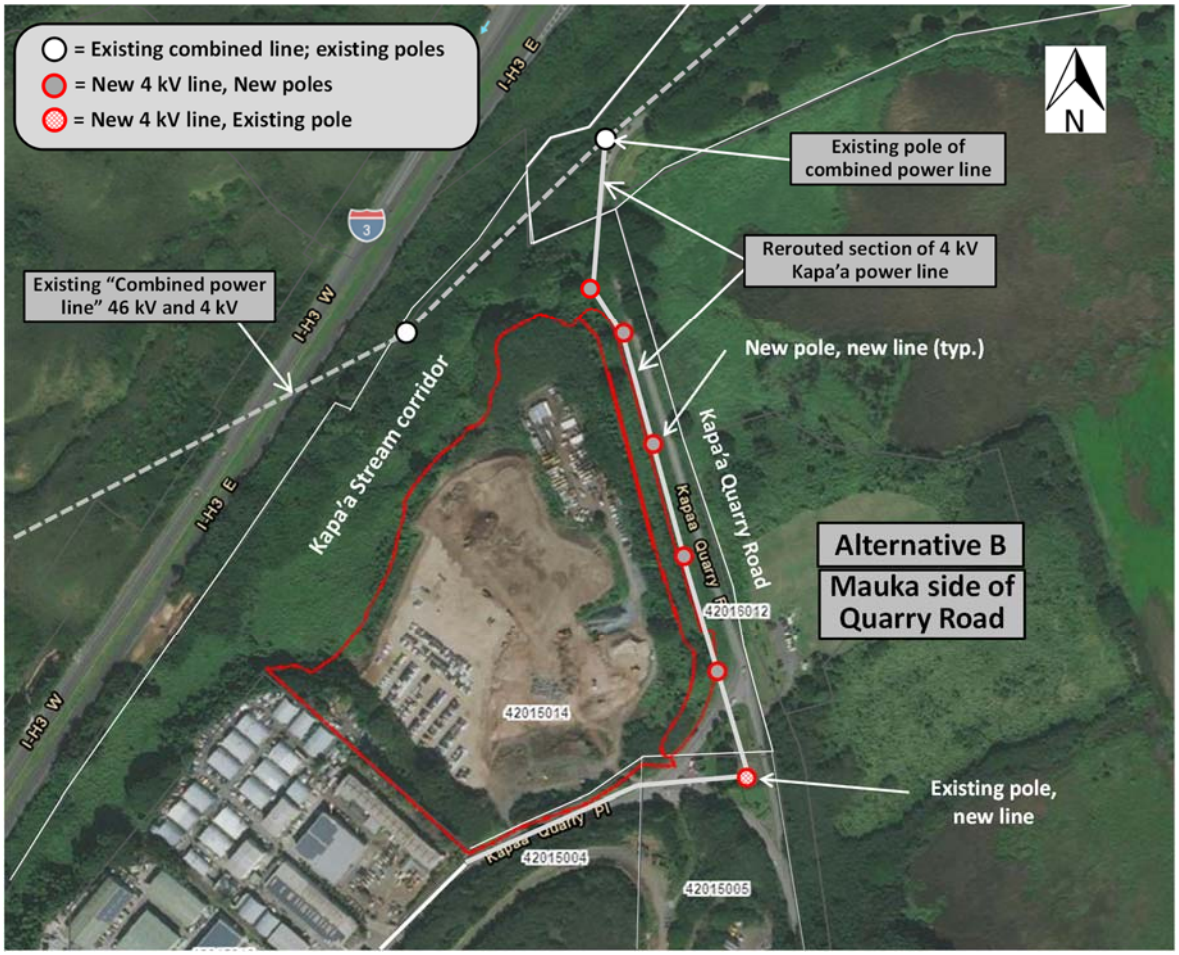


Figure 3.2.2.1. : Alternative B alignment of the New 4 kV Kapa'a power line supplying the KLIP

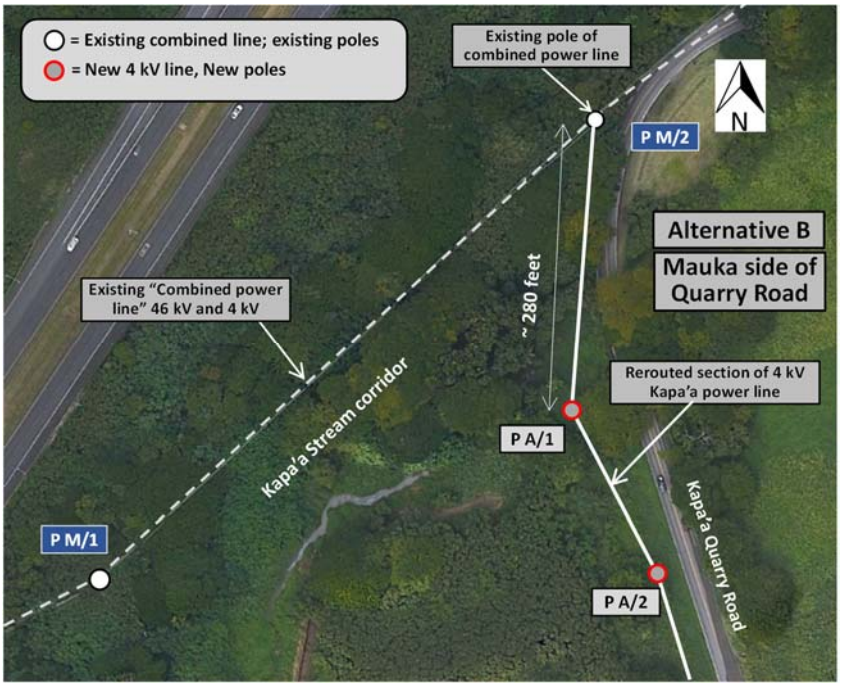
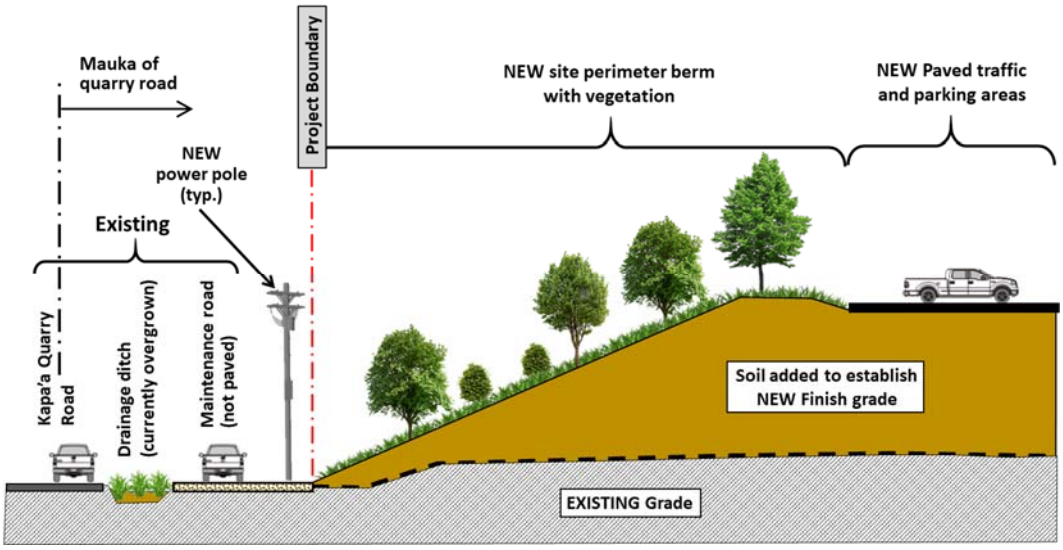


Figure 3.2.2.2 : Detail of Alternative B alignment of the New 4 kV power line

Figure 3.2.2.3 shows a representative cross section of the Alternative B alignment of the new 4 kV Kapa'a power line along the Eastern boundary of the Lower site. The figure illustrates that the new poles of the 4 kV Kapa'a power line would be installed at the project boundary. Installation of the poles would be carried out from the existing maintenance road.



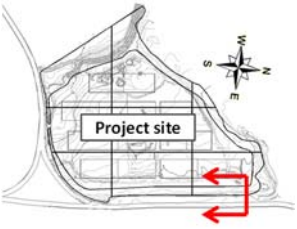


Figure 3.2.2.3: Representative cross section at the Eastern project boundary.

<<<< The location of the cross section is indicated in the overview map on the left.

3.2.3 Alternative Alignment C

Under the Alternative C alignment, the new 4 kV Kapa'a power line would connect to an existing pole of the combined power line, as shown in Figure 3.2.3.1. The Alternative C alignment of the 4 kV Kapa'a power line would start at the existing pole of the combined and run South outside the project site, along the Makai side of the Kapa'a Quarry Road. The first segment of the Alternative C alignment would run from the existing pole of the combined power line to the South, crossing the Kapa'a Quarry Road. The first 250-foot segment would be within TMK 4-2-17:020, owned by the State. The second segment would run South along the Makai side of the quarry road, within TMK 4-2-15:014, owned by Applicant, and end at an existing pole, within TMK 4-2-15:005, owned by the City & County of Honolulu. The length of the powerline inside TMK 4-2-15:005 would be approximately 100 feet.

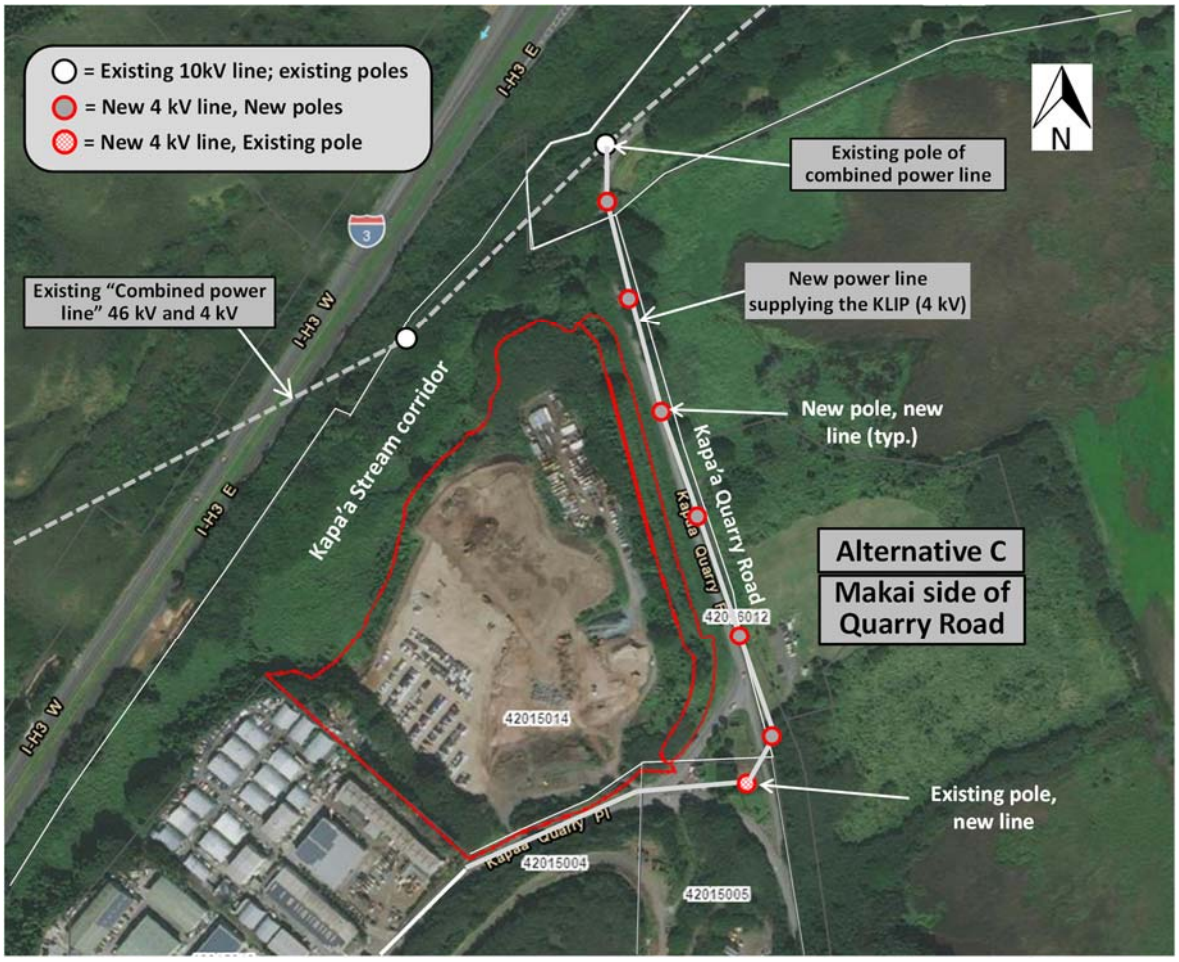


Figure 3.2.3.1: Alternative C alignment of the New 4 kV power line supplying the KLIP

Figure 3.2.3.2 shows a detail of the Alternative C alignment in the vicinity of the Kapa'a Stream corridor. Figure 3.2.3.3 shows a representative cross section of the Alternative C alignment of the new 4 kV Kapa'a power line along the Makai (Eastern) side of the Kapa'a Quarry Road. The figure illustrates that the new poles of the 4 kV Kapa'a power line would be installed on an approximately 7 to 10 feet wide

shoulder, on the Makai side of the roadway. Installation of the poles would be carried out from the existing Kapa'a Quarry Road.

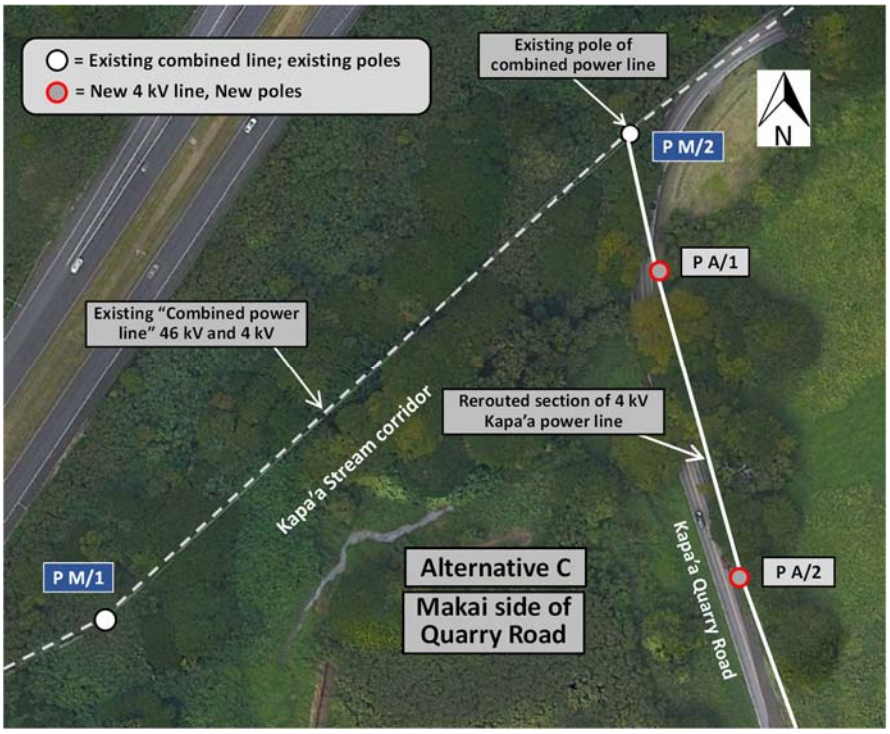
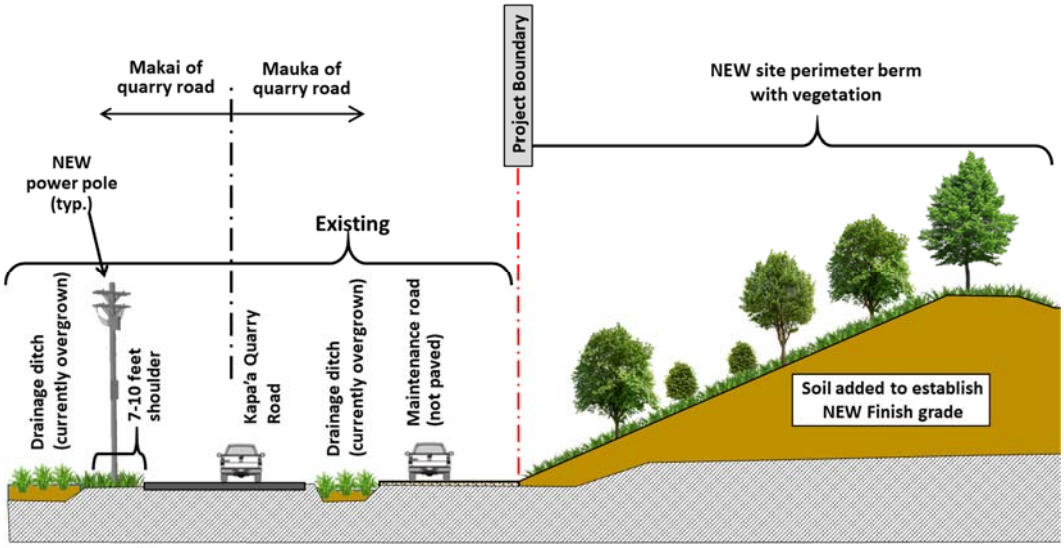


Figure 3.2.3.2: Detail of Alternative C alignment of the New 4 kV Kapa'a power line



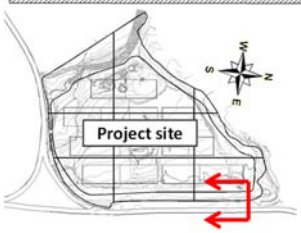


Figure 3.2.3.3: Representative cross section at the Eastern project boundary.

<<<< The location of the cross section is indicated in the overview map on the left side.

3.3 Alternative A Reviewed and Eliminated from Further Consideration

A closer review of expected work of installing Alternative A ,the new section of the 4 kV Kapa'a power line inside the Kapa'a Stream corridor and wetland area, would create significantly more impact than choosing Alternatives B and C. Therefore, it was decided to eliminate Alternative A from further study. This left Alternatives B and C for the remaining consideration.

3.4 Accessibility of the Work Area under Alternatives B and C

A major factor of determining impacts and feasibility of Alternatives B or C was the accessibility of the work area on both sides of the Kapa'a Quarry Road. For work under Alternative B, the Mauka (Western) side of the Kapa'a Quarry Road would have to be accessed and for Alternative C the Makai (Eastern) side.

3.4.1. Accessibility of Locations on Mauka side of the Kapa'a Quarry Road

Figures in this section show typical present site conditions for the installation of the new 4 kV Kapa'a power line, including installation poles and conductors on the Mauka side of Kapa'a Quarry Road. The new 4 kV Kapa'a power line would be installed along the Eastern boundary of the Lower site, and therefore on the Mauka side of the quarry road. Figures 3.4.1.2 through 3.4.1.7 depict representative locations which are pertinent for the installation work of the new 4 kV Kapa'a power line. Figure 3.4.1.1 shows the location of the viewpoint of Figures 3.4.1.2 through 3.4.1.7.

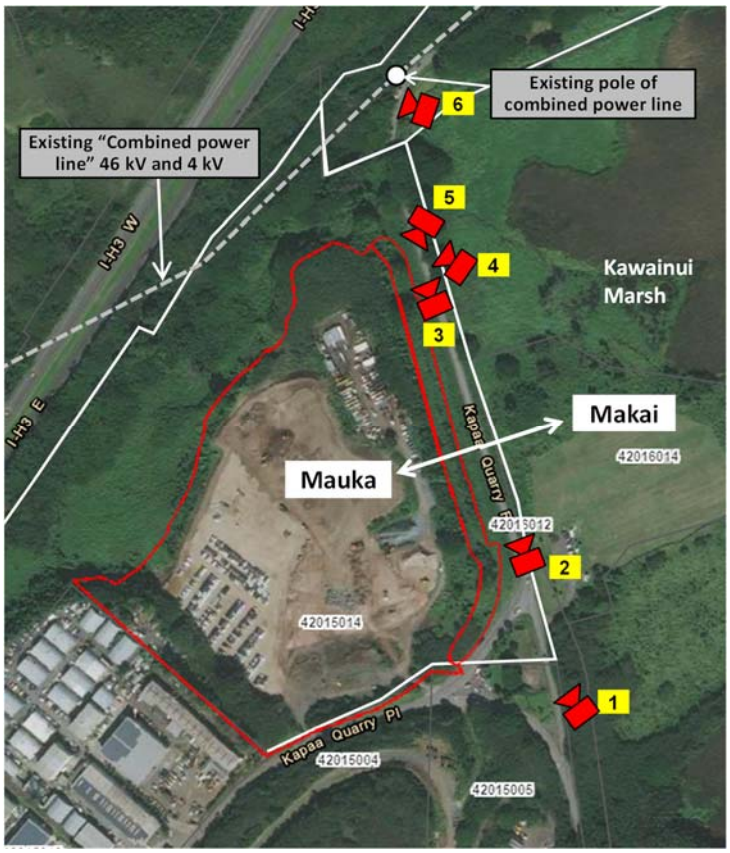


Figure 3.4.1.1:
Locations and directions of views depicting current conditions along the **Mauka side** of the Kapa'a Quarry Road

The new alignment off the 4 kV Kapa'a power line on the Mauka side of Kapa'a Quarry Road would be used by **Alternative B.**

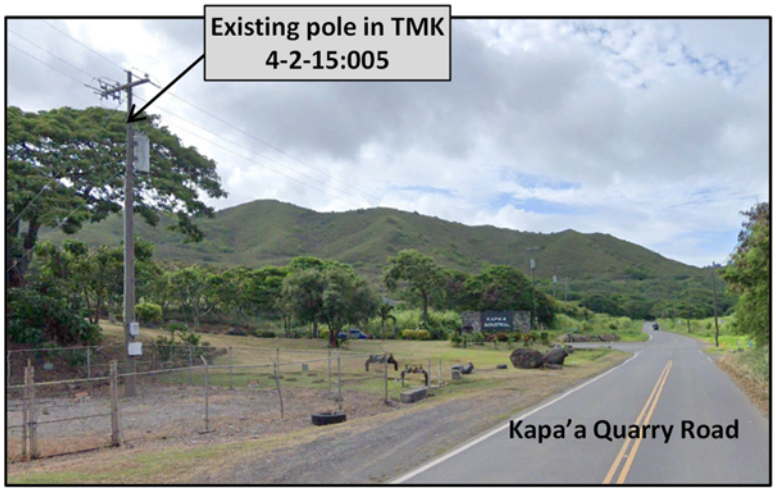


Figure 3.4.1.2: **Image 1 – Mauka side of Quarry Road**

This image shows the existing pole that support the 4 kV power line that supplies the Kapa'a Light Industrial Park and other developments adjacent to the industrial park. This pole is located inside the parcel TMK 4-2-15:005 (City & County of Honolulu). This pole would remain. The pole is easily accessible.

Looking toward the North

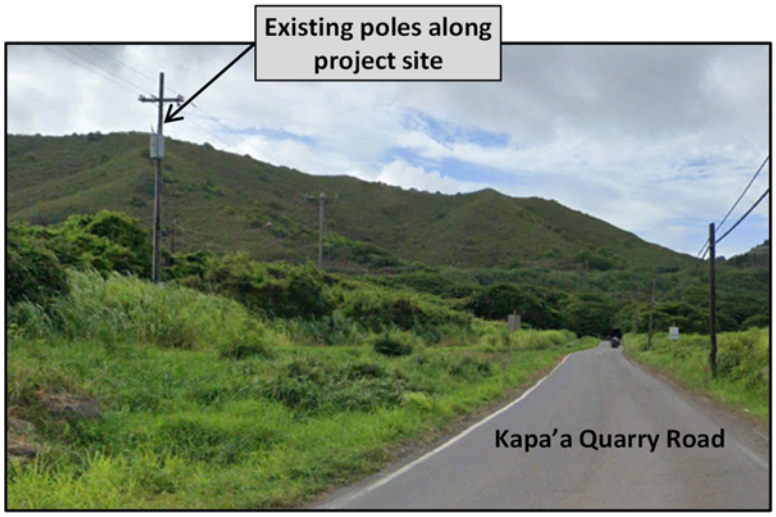


Figure 3.4.1.3: **Image 2 – Mauka side of Quarry Road**

This image shows three existing poles that support the existing 4 kV power line which passes through the Lower site. These poles would be removed after the new 4 kV Kapa'a power line would be added. The poles are accessible from the maintenance road after it has been cleared from vegetation.

Looking toward the North

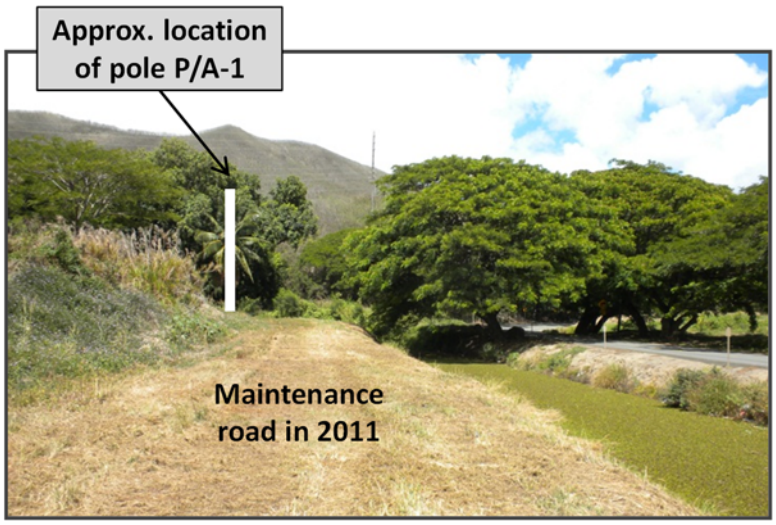


Figure 3.4.1.4: **Image 3 – Mauka side of Quarry Road**

This image shows the condition of the maintenance road in 2011. At that time, the maintenance road was not overgrown.
The approximate location of the new pole P 1/1 is indicated.

Looking toward the North

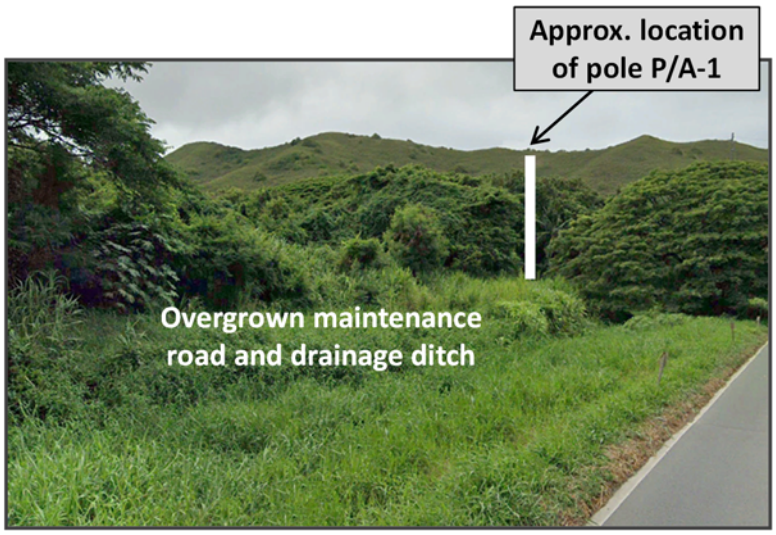


Figure 3.4.1.5: **Image 4 – Mauka side of Quarry Road**

This image shows the approximate location of the future pole P 1/1

The maintenance road is shown at its present overgrown condition.

Looking toward the North.

Figure 3.4.1.6: **Image 5 – Mauka side of Quarry Road**

This image shows the approximate location of the future pole P 1/1

Looking toward the South.

Figure 3.4.1.7: **Image 6 – Mauka side of Quarry Road**

This image shows the approximate location of the entrance of the maintenance road that leads to the existing pole P M/2 of the combined power line.

3.4.2 Accessibility of Locations on Makai side of the Kapa'a Quarry Road

Figures in this section provide an evaluation of site conditions for the installation of the new 4 kV Kapa'a power line, including installation poles and conductors, on the Makai side of the Kapa'a Quarry Road. In Alternative C, the new 4 kV Kapa'a power line would be installed along the Makai side the quarry road. Figure 3.4.2.1 shows the location and directions of views depicting the present site locations. Figures 3.4.2.2 through 3.4.2.7 depict representative locations which are pertinent for the installation work of the new 4 kV Kapa'a power line. Figure 3.4.2.1 shows the location of the viewpoint of Figures 3.4.2.2 through 3.4.2.7.

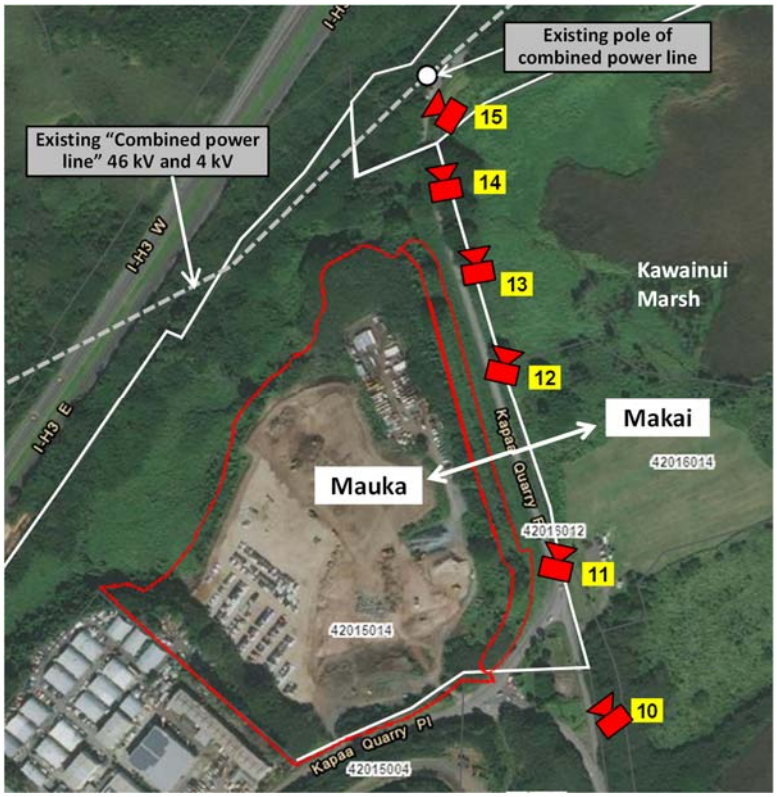


Figure 3.4.2.1: Locations and directions of views depicting current conditions along the Makai side of the Kapa'a Quarry Road

The new alignment of the 4 kV Kapa'a power line on the **Makai** side of Kapa'a Quarry road would be used by **Alternative C.**

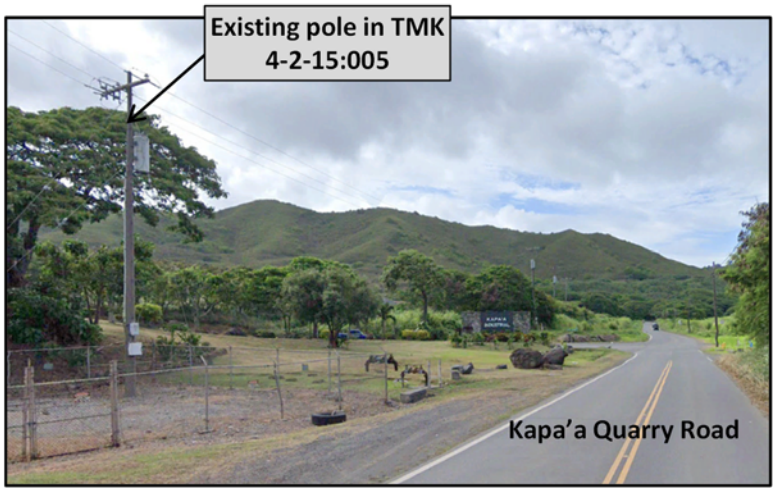


Figure 3.4.2.2: **Image 10 – Makai side of Quarry Road**

This image shows the existing pole that support the 4 kV power line. This pole is located inside the parcel TMK 4-2-15:005 (City & County of Honolulu). This pole would remain. The pole is easily accessible.

Looking toward the North

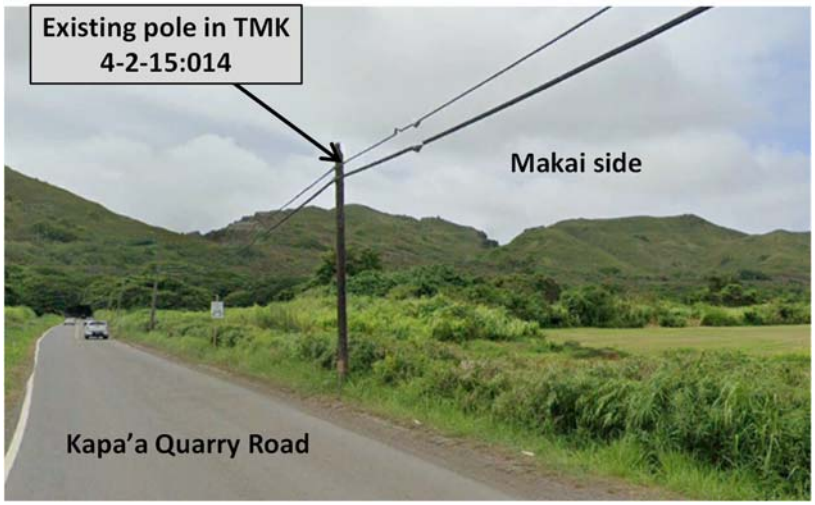


Figure 3.4.2.3: **Image 11 – Makai side of Quarry Road**

This image shows existing utility poles on the Makai side of the Kapa'a Quarry Road. The poles are approximately 2 to 3 feet away from the edge of the pavement. The drainage ditch on the Makai side of the roadway is behind the pole and adjacent vegetation.

Looking toward the North.

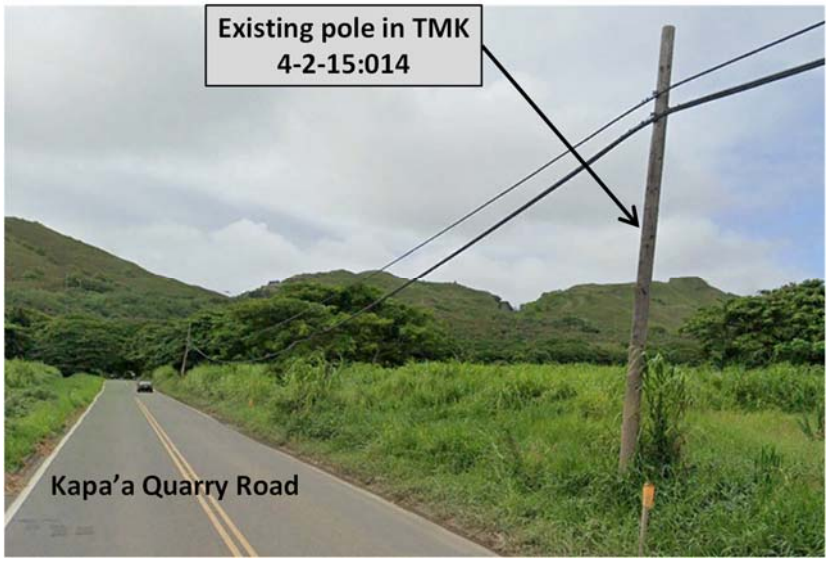


Figure 3.4.2.4: **Image 12 – Makai side of Quarry Road**

This image shows an existing utility pole on the Makai side of the Kapa'a Quarry Road. The pole is about 2 to 3 feet away from the edge of the pavement. The drainage ditch on the Makai side of the roadway is behind the pole and adjacent vegetation.

Looking toward the North.

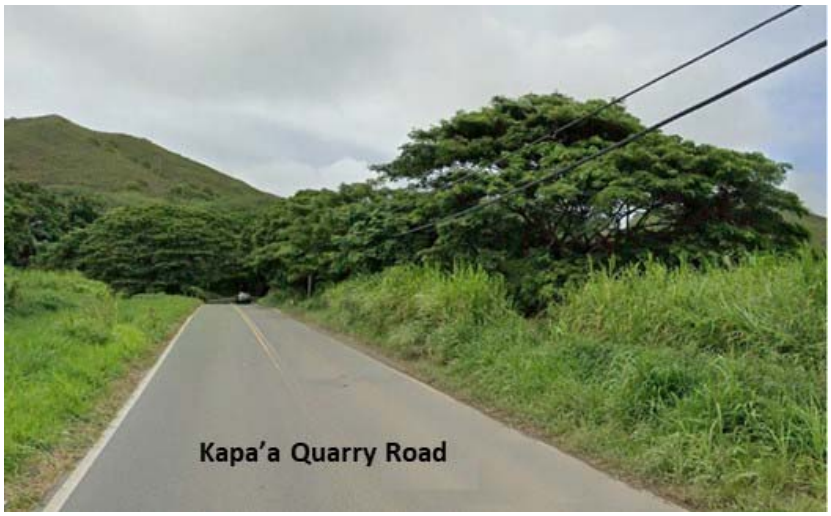


Figure 3.4.2.5: **Image 13 – Makai side of Quarry Road**

This image shows a group of large trees on the makai side of the roadway.
HECO suggested that some branches of these trees would be removed to safeguard against contact to the conductors.

Looking toward the North.

Figure 3.4.2.6: **Image 14 – Makai side of Quarry Road**

This image shows a group of large trees on the makai side of the roadway.
HECO suggested that some branches of these trees would be removed to safeguard against contact to the conductors.

Looking toward the North.

Figure 3.4.2.7: **Image 15 – Makai side of Quarry Road**

This image shows the approximate location of the entrance of the maintenance road that leads to the existing pole P M/2 of the combined power line.

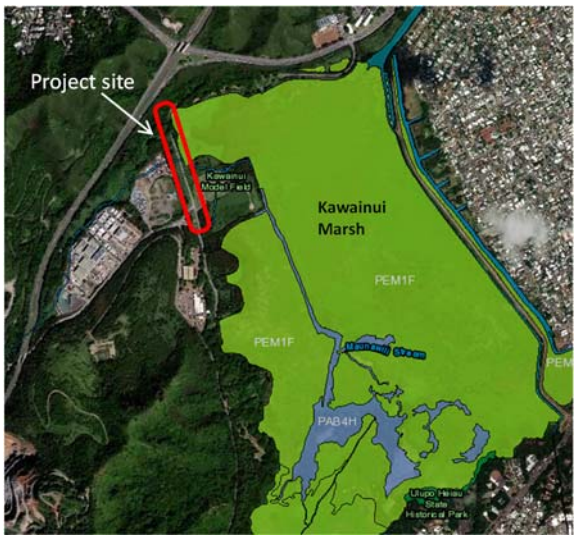
3.5 Other Constraints

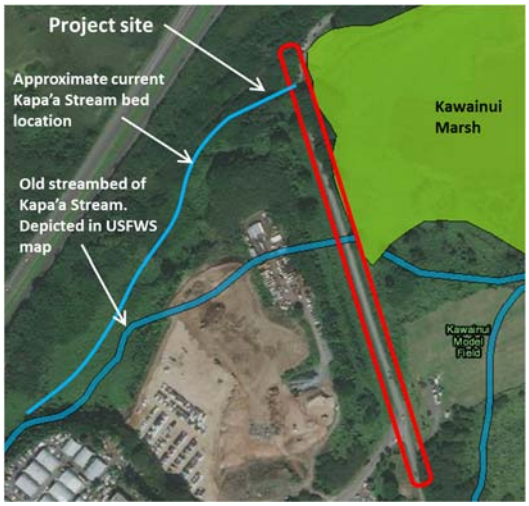
This section discusses two constraints that apply mostly to Alternative C:

1. Proximity to the Kawainui Marsh: Figure 3.5.1 illustrates the location of the boundaries of the delineated Kawainui Marsh, as shown in maps of the National Wetland Inventory, in the vicinity of the project site. As the detailed map in Figure 3.5.1 indicates, the Kawainui Marsh borders to the Eastern side of the Kapa'a Quarry Road.

   Figure 3.5.1 is annotated, and the approximate current location of the Kapa'a Stream is indicated. The "old streambed" in Figure 3.5.1 indicates the location of the original stream bed that was changed to the North when the land fill was formed, some 60 years ago.

2. Shoulder on the Makai side of the quarry road: Figure 3.5.2 shows that there is a 7 to 10 ft shoulder on the Makai side of the quarry road. The poles under the Alternative C would be installed on that shoulder.





<<< Vicinity map

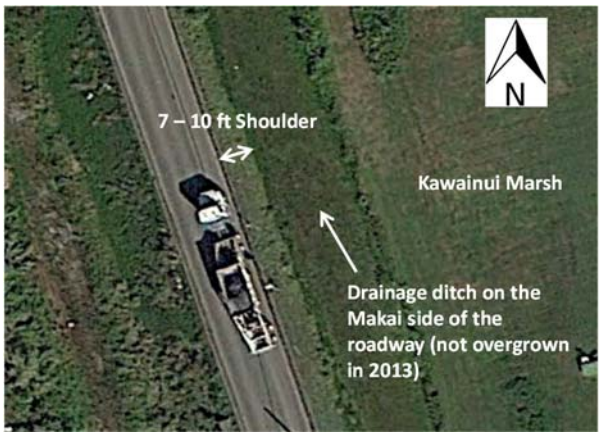
Figure 3.5.1: Delineated wetland in accordance with the National Wetland Inventory

Source: National Wetland Inventory US Fish and Wildlife Service

Annotated and approximate current stream bed of the Kapa'a Stream is added to the USFWS map.

The Kawainui Marsh is listed in the National Wetland Inventory that is maintained by the U.S. Fish and Wildlife Service.

<<< Detail map



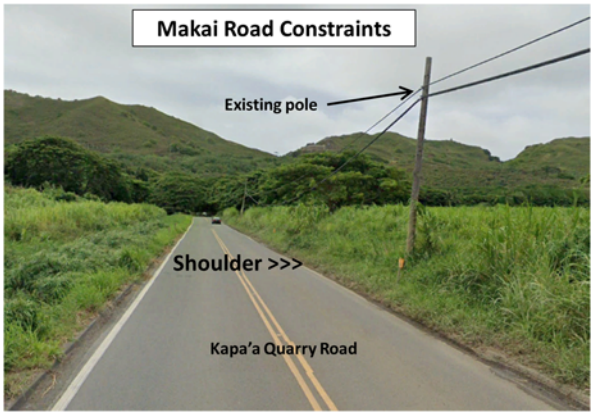


Figure 3.5.2: Shoulder along the Kapa'a Quarry Road on the Makai site of the roadway

3.6 Initial Comparison of Alternatives B and C

An initial quantitative comparison of the alternatives B and C was done addressing accessibility of the work areas, the ease of construction and potential levels of impacts to the environment and the community.

The initial comparison of Alternatives B and C was done using a two-tiered ranking matrix. The ranking was based on expected impacts to the environment and the community, and construction related rationale, including permitting, easements and ease of installation.

In the first ranking tier, 11 impact criteria were defined. Their relative importance, expressed as the overall weight, was assigned with four weight levels, indicating minor to significant effects. The 11 impact criteria were as follows:

1. Impact of wetland: Impacts to wetland areas are both short- and long term.
2. Clear zone - distance from curb traffic safety concerns: A minimum distance is required to assure traffic safety by removing obstacles which are too close to the roadway.
3. Visual impact from poles: The visual impact of the poles is caused by the physical presence of the poles and conductors . There are several visual impact mitigation measures available for the pole line.
4. Maintenance challenges of pole line: Impacts are associated with the maintenance of the poles.
5. Construction impact of poles: Construction of the pole line incurs impacts to the environment and the community.
6. Removal of plants: Removing plants, especially larger trees, can have a negative impact for the environment and the community.
7. Ease of construction – difficulty: Related impacts are mostly a concern of HECO.
8. Traffic impact during construction: Impacts to the traffic are mostly during construction and maintenance.
9. Difficulty of operation of heavy equipment: High impacts occur when heavy machinery and equipment must be brought into land areas with lacking stabilization and need to disturb soil and vegetation.
10. Easement / land ownership challenge: Impacts are related to ease of construction since new granting new easement, outside the property of the Applicant, TMK 4-2-15:014, would require time and permitting efforts.
11. Soil disturbance: Impacts are associate with the scope of the soil disturbance and the possibility of polluted runoff and impacts to the aquatic environment.

In the second tier ranking process the two alternative B and C were assigned individual performance levels of the 11 impact criteria. The results of ranking of each impact criterion were expressed as percentages. The sum of the performance of the 11 impact criteria was the overall ranking for each alternative.

Figures 3.6.1 and 3.6.2 illustrate the results of the initial ranking of Alternatives B and C. Figure 3.6.1 shows the individual results of Alternatives B and C for the 11 performance criteria. Figure 3.6.2 shows the overall ranking of Alternative B and C.

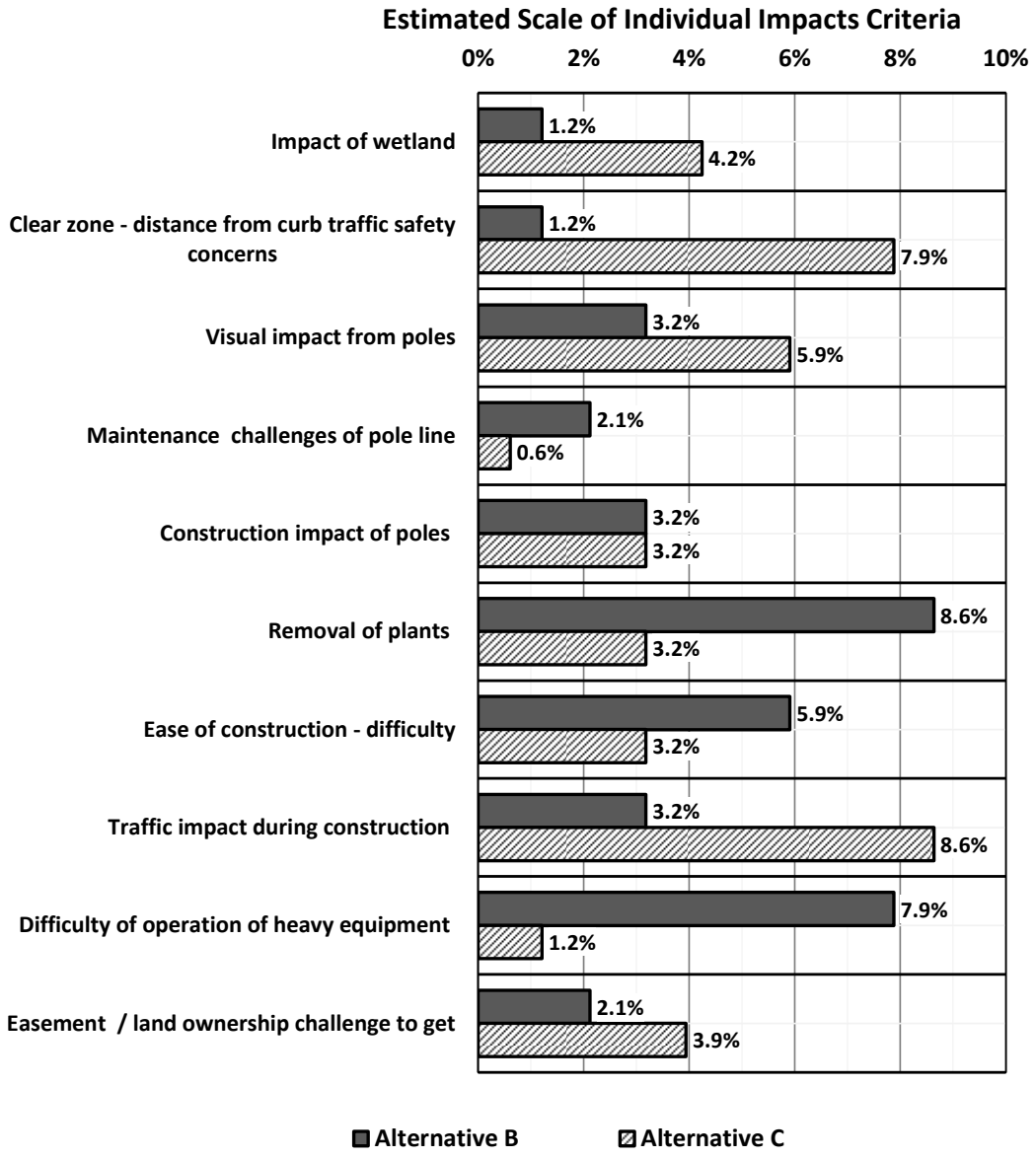


Figure 3.6.1: Results for individual performance criteria

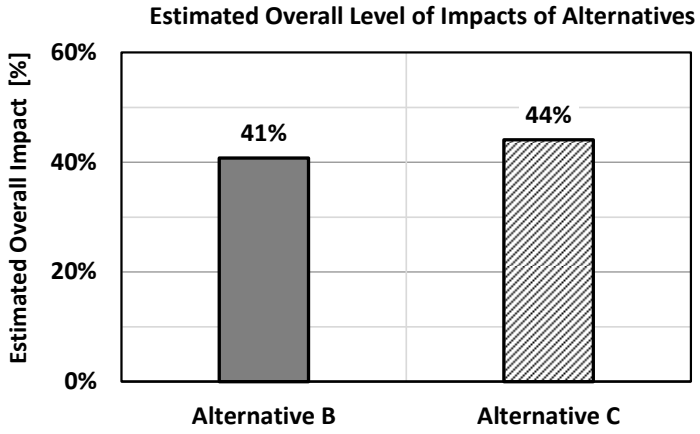


Figure 3.6.2: overall ranking of Alternative B and C

The overall results of the initial ranking of Alternatives B and C suggest that there is no significant difference between Alternatives B and C.

The results of the initial ranking suggested that both alternatives B and C could be considered for implementation. It is recommended that the final selection between Alternative B and C should be done in the subsequent permitting process in consultation with the responsible County agency, HECO and the Applicant.

SECTION 4 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Section 4 describes descriptions of the existing environment and potential impacts on the environment and community resulting from the construction, operation, and maintenance of the relocated sections of the 4 kV Kapa'a power line.

4.1. Introduction

An environmental impact is understood as a change in the affected condition of the existing environment either directly or indirectly by the Proposed Action, long-term or short-term/temporary. Temporary impacts are generally associated with the construction phase of the project. Long term impacts remain for the life cycle of the facility. Mitigation measures can be employed to mitigate both types of impacts.

4.2. Environmental Consequences

This section presents the existing environmental conditions found within the affected project area. Potential changes are described that may occur as a result implementing the Proposed Action, under Alternatives B and C. Effects on natural, human, and cultural environment are described.

Environmental conditions were assessed for the following resource categories:

- Air Quality
- Geology and Soils
- Aquatic Resources
- Botanic Resources
- Wildlife Resources
- Historical and Cultural Resources
- Visual and Aesthetic Resources
- Traffic Impacts

4.2.1 Air Quality

<u>Existing conditions:</u> The EPA has indicated that there are no areas for listed air pollutions in the project area.

<u>Conditions under alternatives B and C:</u> Under both alternatives, work related to relocation of the new power lines and demolition of the existing power line under would include gaseous emissions from construction equipment and dust nuisance. Operation of gasoline and diesel fuel engines associated with construction equipment and vehicles will have temporary negligible air quality impacts in the vicinity of the project. Cumulative impacts would be negligible.

Summary effects: There would be no long-term adverse impacts to air quality under both alternatives.

4.2.2 Geology and Soils

Existing Condition: While the project site of the Kapa'a Light Industrial Park is located on a former landfill, the areas that will be affected by the Proposed Action are outside the landfill area. The existing geology and soil conditions are described in FSEIS.

Conditions under alternatives B and C:

Alternative B: Under Alternative B, the geology and soil conditions the geology and soil would only be affected during the installation of the poles. Excavation would be done to provide the footings of the poles. The diameter and depth of the hole for the foundation would be such to keep the excavated soil to a minimum. Under Alternative B work would not be done close to a wetland or drainage ditch.

Alternative C: Under Alternative C, the geology and soil would only be affected during the installation of the poles. Excavation would be done to provide the footings of the poles. The diameter and depth of the hole for the foundation would be such to keep the excavated soil to a minimum. Since the locations of the poles under the Alternative C would be close to the boundary of the delineated wetland, care will be given not to let fill into the adjacent drainage ditch.

Summary effect: Under both alternatives, no significant impacts are expected, and impacts would be temporary during construction.

4.2.3 Aquatic Resources:

Existing Condition: Aquatic resources at the project site are the Kawainui Marsh, the lower stretches of the Kapa'a Stream and the two drainage ditches on both sides of the Kapa'a Quarry Road. At the present, both drainage ditches along the Kapa'a Quarry Road appear to be filled with quantities of soil and are covered with dense vegetation.

Scope of work under alternatives B and C: Work of the Proposed action that could affect the aquatic resources would include excavating holes to anchor poles and installing the poles.

Alternative B: Work under Alternative B would be performed at the Mauka edge of the unpaved maintenance road. The maintenance road is loaved between the boundary of the Lower site and the Mauka drainage ditch along the Kapa'a Quarry Road. The distance from the location of the poles that will be installed and the Mauka drainage ditch would be around 25 feet. Therefore, the likelihood of fill entering the drainage ditch would be small. Since there would be no poles installed close to the banks of Kapa'a Stream, impacts to the aquatic resources inside the stream should be either absent or negligible.

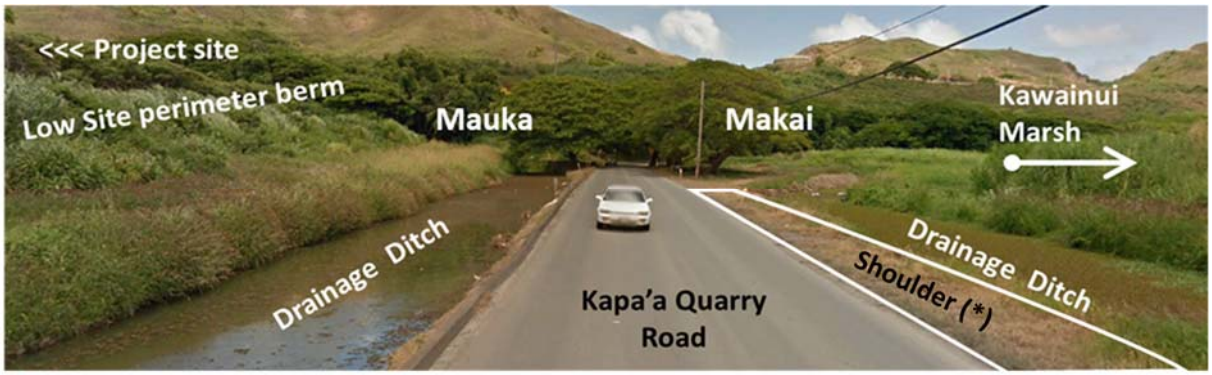
Alternative C: Work under the Preferred Alternative could have potential impacts on the Kapa'a Stream and the Makai drainage ditch along the Kapa'a Quarry Road. Since there would be no poles installed close to the banks of Kapa'a Stream, impacts to the aquatic resources inside the stream should be either absent or negligible. Since there would be multiple poles installed on the Makai side of the

Kapa'a Quarry Road, some impacts are possible to the drainage ditch due to excess excavated fill entering enter the drainage ditch, or the area of the drainage ditch.

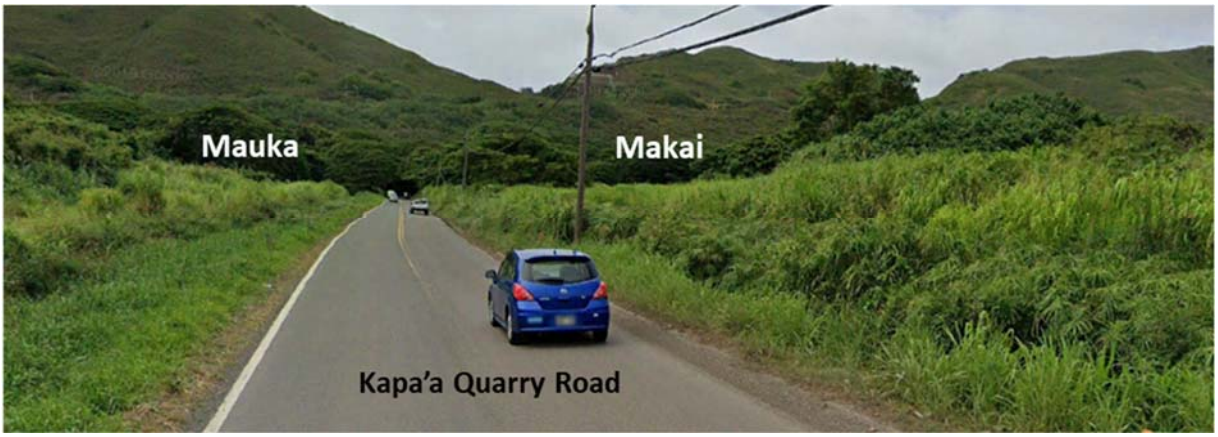
Summary effect: Under the Alternative C, possible minor impacts could exist with aquatic resources in the Makai drainage ditch during installation of poles. Under the Alternative B, the likelihood of such impacts would be smaller. Under both alternatives, the Proposed Action would have short-term impacts and no long-term impacts would be expected.

4.3.4 Botanic Resources

Existing conditions: The botanical conditions at the project site have changed over the past several years. Figure 4.3.4.1 illustrates a comparison between the conditions 2010 (upper image) and at presence (lower image).



Kapa'a Quarry Road with shoulder and adjacent drainage ditches around 2010 (Note: Shoulder (*) indicated the Makai shoulder of the quarry road where poles would be installed)



Kapa'a Quarry Road with shoulder and adjacent drainage ditches, present conditions

Figure 4.3.4.1: Changing conditions of the makai shoulder over the past 10 years

As shown in the upper image of Figure 4.3.4.1, approximately in 2010, the Makai road shoulder of the Kapa'a Quarry Road shows a little vegetation, while a road shoulder on the Mauka site is missing. Both

drainage ditches are shown with a continuous surface layer of algae. The lower image illustrates the conditions of on both sides of the road in 2019. These areas have quantities of smaller invasive grasses close to the road and a dense layer of tall invasive grasses further away from the road.

Scope of work under alternatives B and C: Work would include removal of stretches of invasive vegetation. Work would also include pruning of several larger trees close to a drainage culvert where the Kapa'a Stream enters the Kawainui Marsh and between the existing pole of the combined power line and the Kapa'a Quarry Road.

Alternative B: Under Alternative B, a considerable amount of invasive vegetation would have to be removed from the overgrown maintenance road. The maintenance road is presently covered with a dense layer of tall invasive grasses which must be removed over a length of approximately 1,000 feet to provide access on the maintenance road. Several larger trees could be affected by removing some branches to allow the power line to prepare passage for the 4 kV Kapa'a power line in the vicinity of the Kapa'a Stream.

Alternative C: Under Alternative C, work of installation of poles would cause the removal of a small quantity of grass at locations on the Makai road shoulder. Vegetation in the adjacent Makai drainage ditch would not be removed. Removal of vegetation would be limited to the locations where poles would be installed. Several larger trees would be affected by removing some branches to allow the power line to prepare passage of the 4 kV Kapa'a power line.

Summary effect: Under both alternatives, the effects on botanical resources would be short-term during installation of the poles and the conductors. The Proposed action is not expected to cause significant long-term effect on botanic resources. Some trees would require long-term maintenance to keep branches away from the power lines.

4.3.5 Wildlife Resources

Existing conditions: The locations of both alternatives are adjacent the Kawainui Marsh, which is home to several listed water birds. The 2011 FEIS documents describes the species typically found near the site of the Kapa'a Light Industrial Park. Notably several listed water birds and other wildlife species are found in the Kawainui Marsh.

Scope of work under alternatives B and C: Work on both alternatives could cause short-term as well as long-term effects on wildlife. The levels of impacts caused by the alternatives would differ.

Alternative B:

Short term effects on wildlife would be construction activities which are associated with noise and the presence of larger equipment. It is expected that all work would be performed during the day and therefore there would be no effect due to construction lights trespassing into the marsh. The short-term effects on wildlife are expected to be small. The construction work is a cumulative effect of traffic noise and moving vehicles on Kapa'a Quarry Road. In addition, clearing an approximate 1,000 feet of maintenance road might affect ground breeding birds and other wildlife that has made a home in the presently dense vegetation cover of the maintenance road.

Longer-term effect on wildlife would be the presence of conductors next to the road. According to the US Fish and wildlife Service, electric lines are obstructions typically placed within the range of average bird flight level and are difficult for birds to see. Birds can be injured or killed when they collide with electric lines in mid-flight. Birds are not affected when they perch on electric lines because the electric current does not pass through their bodies. Long-term effects are expected to be lower than under the Alternative C.

The reason is that the conductors would be placed against the background of an existing tree line at the Eastern boundary of the Lower site and the future higher perimeter berms. The presence of the existing tree line and the future higher perimeter berm would lower the likelihood of bird collision as birds gain enough altitude to clear the trees and berms.

Alternative C:

Short-term effects on wildlife would be similar as described under Alternative B.

Longer-term effect on wildlife would be the presence of conductors next to the road. According to the US Fish and wildlife Service, electric lines are obstructions typically placed within the range of average bird flight level and are difficult for birds to see. Birds can be injured or killed when they collide with electric lines in mid-flight. Birds are not affected when they perch on electric lines because the electric current does not pass through their bodies. The presence of the electric lines on the makai side of the roadway would be a cumulative effect. There are existing communication line poles installed on the Makai shoulder.

The conductors of the proposed 4 kV Kapa'a power line would be installed at a higher elevation than the existing communication lines. HECO, the future owner and operator of the 4 kV Kapa'a power line, indicated that the use of a horizontal conductor installation of the power line would be used. This type of horizontal conductor installation has been proven to lower the potential of birds colliding with the electric lines. In addition, HECO indicated plans to install visibility marker balls on the electric lines. While these visibility balls are typically installed for increasing the visibility of the electric lines for humans, they also increase the visibility for birds. In addition to the visibility balls, HECO might consider other types of line marking that would mitigate the effect on flying birds.

Summary effect: Effects on wildlife during construction are expected to be small and only last a short time. Avoidance would contribute to lower direct impacts. Long-term effect could cause impacts to birds colliding with electric lines, which would be more pronounced under Alternative C. Some mitigation measures could be used to lower the incidence of bird collision through suitable line marking and placing the conductor in a horizontal position thereby lowering the lateral impact area.

4.3.6 Historical and Cultural Resources

Existing conditions: The project site of the Proposed Action does currently not affect historical and cultural resources. The 2011 FEIS has indicated that no archaeological or culturally significant resources are located within project site.

Scope of work under alternatives B and C: Under both alternatives, historical and cultural resources would not be affected. It must be mentioned, though, that Alternative C is closer to the delineated boundaries of the Kawainui Marsh.

4.3.7 Visual and Aesthetic Resources

Existing conditions: The visual impressions of people driving on the Kapa'a Quarry Road are dominated by the vegetated open land of the Kawainui Marsh to the East and by the existing vegetated perimeter of the Lower site to the West. There is an existing pole line with communication wires on the Makai side of the roadway. On both sides of the quarry road, the areas around and on the drainage, ditches are presently overgrown with a dense layer of tall invasive grasses.

Scope of work under alternatives B and C: The relevant visual impact under both alternatives would be the long-term visual effects of the power lines. Short-term visual impacts would be limited to construction equipment, including heavy equipment and trucks. Long-term impacts would be by the presence of poles and conductor line. The level of visual impacts and possible visual impact mitigation measures would differ between the two alternatives.

Alternative B: Under Alternative B, both the short-distance and the long-distance visual impact will be less as than Alternative C. The poles will be farther set back from the Kapa'a Quarry Road. The full build-out perimeter berms with vegetation on the slopes and the top of the berm will be approximately the same height or higher than the new poles. This will effectively mitigate the short-distance visual impact as the poles will bend into the background of the vegetated site perimeter berm on the Eastern boundary of the Lower site. Regarding long-distance views across the Kawainui Marsh, the poles will most likely not be noticeable because of the distance of about 1 mile. The owner and operator of the 4 kV Kapa'a power line has indicated that the poles will be wooden poles. Therefore, the color of the poles will help to blend the into the background.

Alternative C: At short-distance views, the pole supporting the 4 kV Kapa'a power line will be clearly visible from traffic on the Kapa'a Quarry Road. With the planned span between poles, the number of the poles might be 5 to 6 within the section fronting the Lower site eastern boundary. With a planned height of the conductors being taler than the existing poles for communication wires, the visual impact of the poles will be most likely dominate that of the conductors. The pole will be set back from the roadway, mitigating the short-distance visual impact. Regarding long-distance views across the Kawainui Marsh, the poles will most likely not be noticeable because of the distance of about 1 mile. The owner and operator of the 4 kV Kapa'a power line has indicated that the poles will be wooden poles. Therefore, the color of the poles will help to blend the into the background.

Summary effect: Under both alternatives, there will be some level of visual impact, with the long-term impacts more pronounced. The short-distance visual impacts caused by the Alternative C would be more noticeable than under Alternative B due to the different distances of the poles from the roadway. Long-distance visual impacts will be comparable, since under both alternatives the poles will blend into the background of the new vegetated site perimeter berms. Visual impact-mitigation measures will be available to lower possible negative visual experiences.

4.3.7 Traffic Impact

Existing conditions: The project site of the Proposed Action is next to the Kapa'a Quarry Road and the Kapa'a Quarry place, which are both classified as a A41, with class street 4. This classification refers to neighborhood road, city streets and unimproved, undivided roads. In addition to providing access to various developments along the Kapa'a Quarry Road and Kapa'a Quarry Place road, the quarry road serves as a popular short cut between Mokapu Blvd. and Kalanianaole Hwy. The road is a 2-lane road which is wide enough to be changed to counterflow traffic during construction and maintenance activities of the 4 kV Kapa'a power line.

Scope of work under alternatives B and C: Work under the Proposed Action would affect traffic on both the Kapa'a Quarry Road and Kapa'a Quarry place, with impacts on the Kapa'a Quarry Road being more pronounced. Traffic impacts will be both short-term, during construction, and long-term during the lifetime of the 4 kV Kapa'a power line.

Alternative B: Under Alternative B, there would be no short-term traffic impacts on the Kapa'a Quarry Road. Accessibility of the maintenance road between the Lower site perimeter and the Mauka drainage ditch would require clearing the dense vegetation over about 1,100 feet. This would require some heavy equipment to move in and out of the maintenance road for several days, affecting traffic at the intersection of the Kapa'a Quarry Road and Place. Short-term traffic would also occur when the conductors were strung over the Kapa'a Quarry Place roadway. Long-term impacts of the Alternative B would be virtually absent since the poles would be at a safe distance from the roadway.

Alternative C: Under Alternative C, short-term traffic impacts would occur during construction by heavy equipment and trucks blocking the Makai lane of the Kapa'a Quarry Road. This would require counterflow and thus traffic impact for several days. The road work schedule would be selected so that rush hours would be avoided. Long-term impacts would be through the presence of poles along the Makai side of the quarry road. Given the relatively narrow Makai road shoulder,, poles would be moved away from the edge of the roadway as much as possible to provide clearance distance for traffic safety. The clearance distance of each pole would be determined in the field since the width of the Makai road shoulder varies in the section where pole installation would occur. HECO has indicated that poles would be installed at widest sections of the shoulder since the maximum span of conductors between poles allows some degree of longitudinal pole positioning.

Summary effect: Under Alternative C, there would be short term and long-term impacts on the traffic flow and safety on the Kapa'a Quarry Road. The short-term impacts would be traffic impacts due to closure of one traffic lane. Long-term effects would be impacts on traffic safety due to installing poles close to the roadway. The short-term impacts would be mitigated by traffic controls and the long-term impacts would be mitigated by keeping the poles a far away from the edge of the roadway as is possible considering the limited width of the Makai shoulder. Under Alternative B, only some short-term traffic impacts would occur and no long-term impacts. These short-term impacts are considered unavoidable and minimal.

4.4 Cumulative Effects of Proposed Action

Cumulative impacts would result from impact of the Proposed Action added to other past, present, and reasonably foreseeable future actions occurring in area adjacent to project site of the Proposed Actions.

There will be considerable surface-disturbing developments, during the mass and fine grading of the Kapa'a Light Industrial Park in the Lower site, which is adjacent to the project site of the relocation of the4 kV Kapa'a power line.

The most likely during of the Proposed Action will be between one and two weeks. The Kapa'a Management will schedule the work of the site development to pause during the installation of the 4 kV Kapa'a power so that cumulative effects would be avoided.

SECTION 5 - UNAVOIDABLE ADVERSE IMPACTS

Impacts to physical resources would be temporary resulting from construction activities. Terrestrial resources impacts would include soil disturbance and increased erosion potential.

Temporary air quality impacts would be caused by vehicular dust and gaseous emissions. Implementation of HECO's standard construction practice of construction, restoration and stabilization measures would contribute to limit the duration and extent of these impacts.

Significant impacts to aquatic resources are not expected from the implementation of the Proposed Action. Some impacts might be from inadvertent deposition of soil as a byproduct of the auger equipment.

SECTION 6 - CONSTRUCTION IMPACT MITIGATION MEASURES CONSIDERED

Section 6 describes impact mitigation measures which will be considered for short-term impacts related to construction include:

- Construction storm water impacts will be managed to comply with requirements the National Pollutant Discharge Elimination System (NPDES) for Construction Activities (NPDES General Construction Stormwater Permit). Typical mitigation measures to be implemented by HECO will include:
  - Silt fence or filter sock as a temporary perimeter control that restricts sediment-laden runoff from leaving the construction site.
  - Avoidance of stockpiling of cut or fill on the shoulder to avoid runoff into the adjacent drainage ditch.
  - Removing the cut right after auger has been completed.
  - Concrete waste management if applicable
  - Construction waste management
- Traffic controls will be implemented during construction in form of signage and signal people directing the counterflow on the Kapa'a Quarry Road and the Kapa'a Quarry Place.

SECTION 7 - CONSTRUCTION WORK PROCESS AND O&M

Section 7 describes the expected work process of the Proposed Action.

7.1 Work Force

The number of workers and type of equipment will be determined by the owner and operator of the 4 kV Kapa'a power line, HECO.

Construction will occur within the right-of-way and authorized access roads and consist of sequential activities performed by a series of crews.

Construction will generally occur between 8 a.m. and 5 p.m. Monday through Fridays. A change in construction hours might be warranted depending on the traffic volume.

Additional hours may be necessary to complete critical construction activities, such as disconnecting the existing 4 kV line and hooking up the new 4 kV Kapa'a power line.

7.2. Construction Equipment and Traffic

Equipment required to install the 4 kV Kapa'a power line will include, but is not limited to, the equipment listed in Table 6.2.1.

Activity	**Potential Equipment (Preliminary)**
Tree clearing	Pickups, bucket truck, Hydro-crane, wheel tractor with flatbed trailer,
Clearing and Site Preparation	Pickups, bulldozers, dump trucks, front-end loaders
Auguring	Pickups, drill rigs, front-end loaders
Erection	Pickups, bucket truck, Hydro-crane, wheel tractor with flatbed trailer, boom truck, air compressor, crane
Stringing	Wire reel trailer, tensioner, puller pickup trucks, hi-reach, caterpillar with winch, winch truck, splicing truck
Restoration and Cleanup	Pickups, bulldozers, front-end loaders

HECO will conform to necessary transportation safety requirements for maintaining public traffic flow. Construction operations will be conducted in a manner that provides the least possible obstruction and inconvenience to public traffic.

7.3 Operation and Maintenance

Operation and maintenance work on Forest Service land for the Hankins 4 kV Kapa'a power line includes inspections, repair of structures or conductors, and vegetation and tree management.

Inspection of power lines: The owner and operator of the 4 kV Kapa'a power line, HECO, will inspect for hazardous conditions and other possible maintenance problems in accordance with company guidelines

and applicable regulations. HECO will determine the timing and nature of maintenance and repair activities on the transmission line based on periodic inspections. Inspections will be performed from the ground.

Routine Maintenance and Repair Activities: Routine maintenance and repair of the transmission line and structures would include replacing damaged insulators and other wires and equipment as needed.

Vegetation Management: HECO will perform proper maintenance and/or removal of trees and vegetation near the power line to ensure safe and reliable delivery of power. Maintenance practices will be employed with the goal of eliminating potential tree contacts with conductors and controlling growth of vegetation that could affect the power line. HECO will follow company procedure on appropriate tree management. Growth rate of trees and proximity to the lines will be considered when and how to perform vegetation control. A reasonable margin of distance beyond the minimum clearance requirements would be factored in to allow for growth and wind sway.