STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

Land Development Division

Date: 2/2/2026

Addendum No. 2
to
Invitation For Bids
IFB-23-HHL-013

West O'ahu Sewer Improvements – Princess Kahanu Estates (PKE) Subdivision

Notice to All Prospective Offerors

This addendum is hereby made a part of the contract documents for West O'ahu Sewer Improvements – PKE Subdivision, IFB-23-HHL-013, and it shall amend the said contract documents as detailed within this Addendum document.

APPROVED:

R. Kalani Fronda

R. Kalani Fronda, CCIM, Acting Administrator
Land Development Division
Department of Hawaiian Home Lands

Please execute and immediately return the receipt below to the Department of Hawaiian Home Lands email: **Sara Okuda, Land Development Division, sara.t.okuda@hawaii.gov.**

Receipt of Addendum No.___ for West O'ahu Sewer Improvements – Princess Kahanu Estates Subdivision, IFB-23-HHL-013, is hereby acknowledged.

Signature: _____ _____
Print Name: Title

_____ _____
Name of Firm/Company Date

Addendum No. 2

February 2, 2026

West O‘ahu Sewer Improvements – Princess Kahanu Estates Subdivision
Wai‘anae, Island of O‘ahu

IFB No.: IFB-23-HHL-013

This Addendum No. 2 shall incorporate the following amendments:

Pre-bid Conference
Updating link to Click Here to Join the Meeting:

To be held at 10:30 am, H.S.T. on February 5, 2026, via Microsoft Teams Meeting at:

Click Here to Join the Meeting
Meeting ID: 260 744 061 941 04
Passcode: nw9SP6Ft

Or Dial in by phone**:** +1 808-913-3667, Phone conference ID: 288 271 145#

Geotechnical Engineering Reports
The attached are added to the bid documents for additional information.

Record Drawings
The attached are added to the bid documents for additional information.

End of Addendum No. 2

GEOTECHNICAL INVESTIGATION
DHHL WEST OAHU SEWER IMPROVEMENTS
PRINCESS KAHANU ESTATES,
NANAKULI, HAWAII
TMK: PORTIONS OF 8-7-042 AND 043

for

FUKUNAGA & ASSOCIATES, INC.

HIRATA & ASSOCIATES, INC.
W.O. 20-6556
June 4, 2021

Hirata & Associates
Geotechnical Engineering
Hirata & Associates, Inc.
99-1433 Koaha Pl
Aiea, HI 96701
tel 808.486.0787
fax 808.486.0870

June 4, 2021
W.O. 20-6556

Mr. Jon Muraoka
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Muraoka:

Our report, "Geotechnical Investigation, DHHL West Oahu Sewer Improvements, Princess Kahanu Estates, Nanakuli, Hawaii, TMK: Portions of 8-7-042 and 043," dated June 4, 2021, our Work Order 20-6556 is enclosed. This investigation was conducted in general conformance with the scope of services presented in our proposal dated December 27, 2019.

The existing asphaltic concrete pavement encountered in the test borings consisted of approximately 2 to 5 inches of AC over about 3 to 7 inches of base material. The predominate near surface soil below the pavement section consisted of light brown to tan clayey/silty coralline sand and gravel. The clayey/silty coralline sand and gravel was in a variable condition ranging from loose to dense and extended down to depths ranging from about 3 feet to the maximum depth drilled in some of the borings. Underlying the near surface soils in borings B1, B3, B7, B9, B10, B11, B12, and B13 were coral, coral rubblestone, and cemented coralline sand. The coral, coral rubblestone, and cemented coralline sand were generally in dense to hard conditions.

Conventional pipe cushion may be used to support the proposed sewer lines. In accordance with the 2017 Wastewater System Design Standards, CLSM should be used as trench backfill material above the pipe bedding for sewers located within the roadway. However, if acceptable, imported select borrow as well as the onsite clayey/silty coralline sand and gravel may also be used for trench backfill.

We appreciate this opportunity to be of service. Should you have any questions concerning this report, please feel free to call on us.

Very truly yours,

HIRATA & ASSOCIATES, INC.

Jennifer H. Yamaguchi President

JHY:CCT

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GEOTECHNICAL INVESTIGATION
DHHL WEST OAHU SEWER IMPROVEMENTS
PRINCESS KAHANU ESTATES, NANAKULI, HAWAII
TMK: PORTIONS OF 8-7-042 AND 043

INTRODUCTION

This report presents the results of our geotechnical investigation performed for the proposed sewer improvements at the Department of Hawaiian Home Lands (DHHL) Princes Kahanu Estates residential subdivision in Nanakuli, Oahu, Hawaii. Our scope of services for this study included the following:

- A visual reconnaissance of the site and its vicinity to observe existing conditions which may affect the project. The general location of the project site is shown on the enclosed Location Map, Plate A2.1.

- A review of available in-house soils information pertinent to the site and the proposed project.

- Drilling and sampling fourteen exploratory borings to depths ranging from about 13.5 to 19.5 feet. A description of our field investigation is summarized on Plates A1.1 and A1.2. The approximate exploratory boring locations are shown on the enclosed Boring Location Plan, Plates A2.2 through A2.6, and the soils encountered in the borings are described on the Boring Logs, Plates A4.1 through A4.14.

- Laboratory testing of selected soil samples. Testing procedures are presented in the Description of Laboratory Testing, Plates B1.1 and B1.2. Test results are presented on the Unified Soil Classification System Sheet (Plate A3.2), the Boring Logs (Plates A4.1 through A4.14), Consolidation Test report (Plate B2.1), Direct Shear Test reports (Plates B3.1 through B3.4), Sieve Analysis Test reports (Plates B4.1 and B4.2), and CBR Test reports (Plates B5.1 through B5.4).

- Engineering analyses of the field and laboratory data.

- Preparation of this report presenting geotechnical recommendations for the design of sewer pipe support, trench excavation and backfill, manhole structures, and replacement of flexible pavement.

PROJECT CONSIDERATIONS

Information regarding the proposed project was provided by your office.

The project consists of improvements to the existing sewer system in the Princess Kahanu Estates Subdivision in Nanakuli. The proposed improvements include repairs or replacement of approximately 8,090 lineal feet of existing sewer lines and 20 new manholes. The sewer lines will be 8 and 12 inches in diameter with inverts extending to depths ranging from about 5 to 16 feet.

SITE CONDITIONS

The project site includes portions of Princess Kahanu Avenue, Kaleiwohi Street, Waiolu Street, Waiolu Place, Pualeilani Street, Laiku Street, Laiku Place, Muolo Street, and Laanui Street in the Princess Kahanu Estates Subdivision located in Nanakuli, Hawaii. The site is generally bordered by residential lots. The site generally slopes downward in a southerly direction with ground elevations along the sewer line alignments ranging from about +22 on the north end of the site to +10 on the south.

SOIL CONDITIONS

The existing asphaltic concrete pavement encountered in the test borings consisted of approximately 2 to 5 inches of AC over about 3 to 7 inches of base material.

The predominate near surface soil below the pavement section consisted of light brown to tan clayey/silty coralline sand and gravel. The clayey/silty coralline sand and gravel was in variable conditions ranging from loose to dense and extended down to depths ranging from about 3 feet to the maximum depth drilled in some of the borings. Underlying the near surface soils in borings B1, B3, B7, B9, B10, B11, B12, and B13 were coral, coral rubblestone, and cemented

coralline sand. The coral, coral rubblestone, and cemented coralline sand were generally in dense to hard conditions.

Groundwater was encountered in borings B5, B7, B8, B10, B11, B12, B13, and B14, at depths ranging from about 5.7 to 14.2 feet. Neither groundwater nor seepage water was encountered in the remaining borings.

CONCLUSIONS AND RECOMMENDATIONS

Pipe Support

Conventional crushed rock cradles may be used to support the replacement sewer lines. The pipe bedding material should conform to, and be placed in accordance with, specifications in the 2017 Wastewater System Design Standards of the City. Clean basaltic gravel conforming to ASTM D-448, Size No. 67 is recommended. The bedding material should also be placed along the sides of the pipe and up to a minimum 12 inches above the pipe and enveloped in a geotextile filter fabric. In areas where the sewer line is below groundwater, the bedding material should extend to 12 inches above groundwater level. Precaution should be taken to prevent damaging the pipes during compaction of the bedding material.

Trench Excavation and Backfill

Trench Excavation - Trench excavations into the onsite soils can generally be accomplished using conventional excavating equipment. However, excavations into the dense to medium hard coral, coral rubblestone, and cemented coralline sand may require hydraulic equipment. Excavation sidewalls exposing surface soils are expected to stand for temporary conditions at slopes of 1H:1V or flatter. If laying back the trench excavation sidewalls is not feasible, shoring may be required to maintain the stability of the trench excavations. Cuts exposing the medium hard to hard coral, coral rubblestone, and cemented coralline sand should stand at near vertical for temporary conditions. Excavations extending below groundwater will require shoring. It should be the Contractor's responsibility to conform to all OSHA safety standards for excavations.

Trench Backfill - As indicated in the 2017 Wastewater System Design Standards, Control Low Strength Material (CLSM) should be used as trench backfill material for sewers located within the roadways, in order to minimize potential pavement settlement. The CLSM should be capable of being excavated with hand tools and have a 28-day compressive strength between 50 and 150 pounds per square inch. If acceptable to the City, imported select borrow conforming to Section 30 of the

Standard Specifications for Public Works Construction, as well as the onsite clayey/silty coralline sand and gravel may also be used as trench backfill, provided all rock fragments larger than three inches in maximum dimension are removed. The excavated coral and cemented coralline sand will need to be processed, or crushed to a well-graded consistency prior to reuse.

The backfill should be placed in horizontal lifts restricted to 8 inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. In paved roadway areas, the upper 24 inches of trench backfill below pavement sections should be compacted to a minimum 95 percent compaction.

Unless covered by asphalt or concrete at ground surface, the upper 12 inches of trench backfill should consist of low permeability soil. The low permeability soil should be moisture conditioned to about 2 percent above optimum moisture content and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. The intent of this recommendation is to reduce the potential for surface water infiltration into the trench backfill material.

The following values may be used to estimate the potential initial vertical deflection of the flexible pipes.

Backfill Material	Unit Weight (pcf)	Soil Modulus, E', (psi)
Onsite silty/clayey sand and gravel	125 - 135	2000
Imported Select Borrow	125 - 140	2000
CLSM	115- 145	3000

Manhole Structures

Spread footings or mat type foundations may be used for support of the manholes. An allowable bearing value of 2,500 pounds per square foot may be used for

design. To provide for a working base, 6 inches of crushed rock underlain by a geotextile fabric should be placed below the foundations.

The allowable bearing value is for the total of dead and frequently applied live loads, and may be increased by one-third for short duration loading which includes the effect of wind and seismic forces.

For lateral earth pressure considerations, equivalent fluid pressures of 55 and 90 pounds per cubic foot may be used for restrained or at-rest condition for above groundwater and below groundwater, respectively.

Prior to placement of the working base, the bottom of the excavations should be cleaned of loose material and thoroughly tamped. The gravel working base should also be compacted to an unyielding condition.

Backfill around the manhole structures should consist of either imported select borrow, onsite clayey/silty sand and gravel, or CLSM. The backfill should be placed in horizontal lifts restricted to 8 inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. In paved roadway areas, the upper 24 inches of trench backfill below pavement sections should be compacted to a minimum 95 percent compaction as determined by ASTM D 1557.

Replacement Pavement Section

The minimum restored pavement section for open trench construction through existing paved areas should meet current City standard requirements or existing conditions, whichever is thicker. Based on our CBR test results and the City's Engineering & Policy Memo No. CEB-1-06, the following minimum section is recommended. The aggregate base course and subgrade should be compacted to a minimum 95 percent compaction as determined by ASTM D 1557.

2.0”	Asphaltic Concrete
3.0”	Asphalt Treated Base Course
6.0”	Aggregate Base Course (CBR = 85 minimum)
11.0”	Total Thickness

ADDITIONAL SERVICES

We recommend that we perform a general review of the final design plans and specifications. This will allow us to verify that the earthwork recommendations have been properly interpreted and implemented in the design plans and construction specifications.

For continuity, we recommend that we be retained during construction to (1) observe the bottom of trench excavations prior to placement of pipe cushion material, (2) observe trench backfill placement and perform compaction testing, (3) observe manhole foundation excavations prior to placement of gravel working base, (4) review and/or perform laboratory testing on import borrow to determine its acceptability for use in compacted fills, and (5) provide geotechnical consultation as required.

Our services during construction will allow us to verify that our recommendations are properly interpreted and included in construction, and if necessary, to make modifications to those recommendations, thereby reducing construction delays in the event subsurface conditions differ from those anticipated.

LIMITATIONS

The boring logs indicate the approximate subsurface soil conditions encountered only at those times and locations where our borings were made, and may not represent conditions at other times and locations.

This report was prepared specifically for Fukunaga and Associates, Inc. and their sub-consultants for design of the proposed sewer improvements in Nanakuli, Hawaii. The boring logs, laboratory test results, and recommendations presented

in this report are for design purposes only, and are not intended for use in developing cost estimates by the contractor.

During construction, should subsurface conditions differ from those encountered in our borings, we should be advised immediately in order to re-evaluate our recommendations, and to revise or verify them in writing before proceeding with construction.

Our recommendations and conclusions are based upon the site materials observed, the preliminary design information made available, the data obtained from our site exploration, our engineering analyses, and our experience and engineering judgment. The conclusions and recommendations in this report are professional opinions which we have strived to develop in a manner consistent with that level of care, skill, and competence ordinarily exercised by members of the profession in good standing, currently practicing under similar conditions in the same locality. We will be responsible for those recommendations and conclusions, but will not be responsible for the interpretation by others of the information - developed. No warranty is made regarding the services performed, either expressed or implied.

Respectfully submitted,

HIRATA & ASSOCIATES, INC.

Con Truong, Project Engineer



This work was prepared by
me or under my supervision.
Expiration Date of License:
April 30, 2022

APPENDIX A

FIELD INVESTIGATION

DESCRIPTION OF FIELD INVESTIGATION

GENERAL

The site was explored between April 12 and 28, 2021, by performing a visual reconnaissance of the site and drilling 14 test borings to depths ranging from about 13 to 19.5 feet with a Mobile B80 truck-mounted drill rig.

During drilling operations, the soils were continuously logged by our field engineer and classified by visual examination in accordance with the Unified Soil Classification System. The boring logs indicate the depths at which the soils or their characteristics change, although the change could actually be gradual. If the change occurred between sample locations, the depth was interpreted based on field observations. Classifications and sampling intervals are shown on the boring logs. A Boring Log Legend is presented on Plate A3.1, while the Unified Soil Classification System is shown on Plate A3.2. The soils encountered are logged on Plates A4.1 through A4.14.

Borings were located in the field by measuring/taping offsets from existing site features shown on the plans. Surface elevations at boring locations were estimated based on an advance print of topographic survey map prepared by ControlPoint Surveying, Inc, dated March 3, 2021. The accuracy of the boring locations shown on Plates A2.2 through A2.6 and the boring elevations shown on Plates A4.1 through A4.14 are therefore approximate, in accordance with the field methods used.

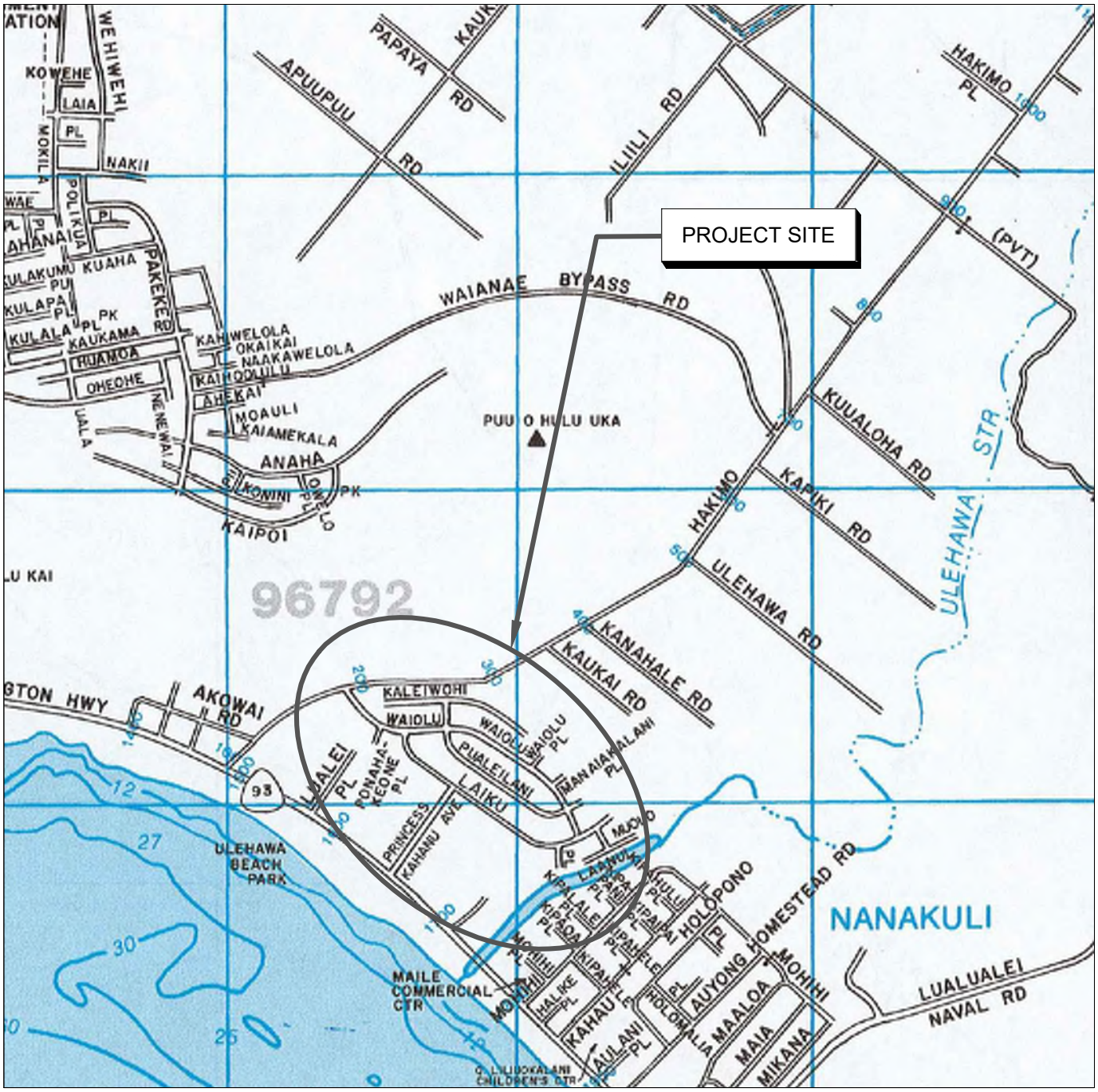
SOIL SAMPLING

Representative and disturbed samples, as well as bulk soil samples, were recovered from the borings for selected laboratory testing and analyses. Representative samples were recovered by driving a 3-inch O.D. split tube sampler a total of 18 inches with a 140-pound hammer dropped from a height of 30 inches. Disturbed samples were obtained by driving a 2-inch O.D. standard

split spoon sampler a total of 18 inches with a 140-pound hammer dropped from a height of 30 inches. The number of blows required to drive the samplers the final 12 inches are recorded at the appropriate depths on the boring logs, unless noted otherwise.

ROCK SAMPLING

Core samples of coral and cemented coralline sand were obtained by drilling with NX and HQ core barrels having inside diameters of 2.1 and 2.5 inches, respectively. Recovery percentages for each core run are shown on the enclosed Boring Logs.



Reference: Bryan's Sectional Maps, 2016 Edition
(Copyright J.R. Clere, used with permission)

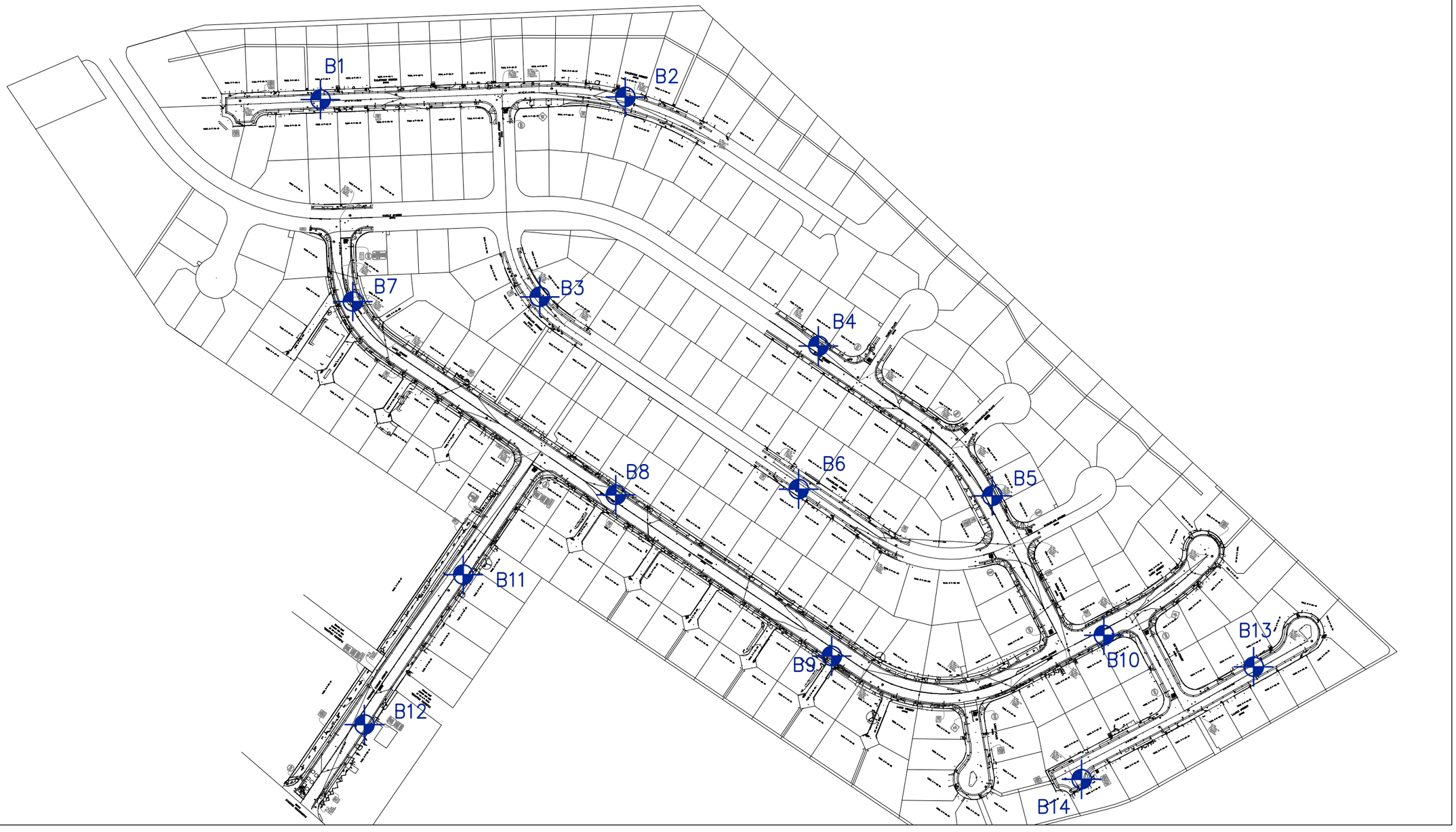
DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

LOCATION MAP

Plate
A2.1



LEGEND:

Approximate location of borings

Reference: Advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.

GRAPHIC SCALE:

0 100 200 400FT.

1" = 200'

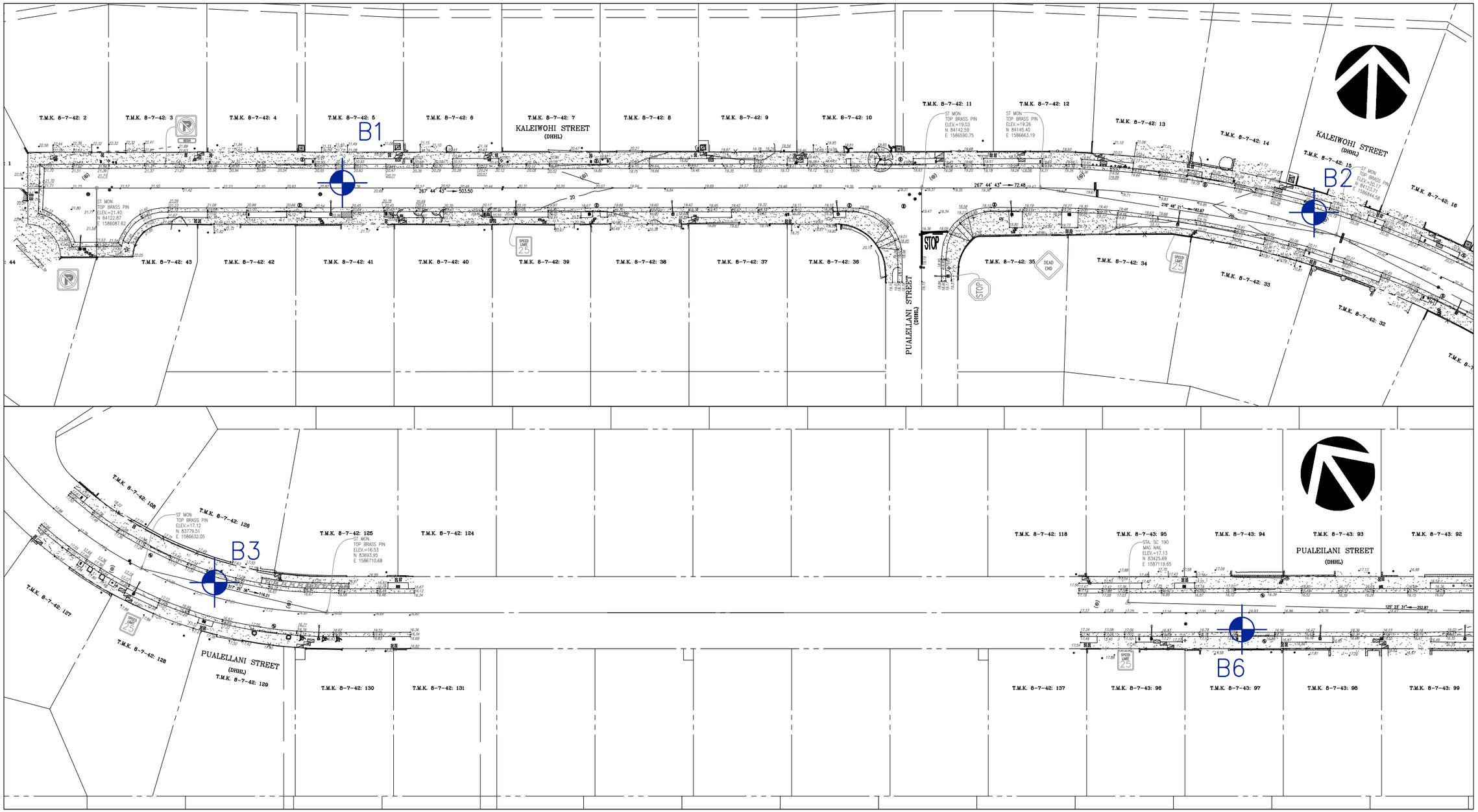
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W.O. 20-6556

BORING LOCATION PLAN

Plate A2.2



LEGEND:

Approximate location of borings

Reference: Advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.

GRAPHIC SCALE:

0 30 60 120FT.

1" = 60'

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

BORING LOCATION PLAN

Plate A2.3



LEGEND:

Approximate location of borings

Reference: Advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.

GRAPHIC SCALE:

0 30 60 120FT.

1" = 60'

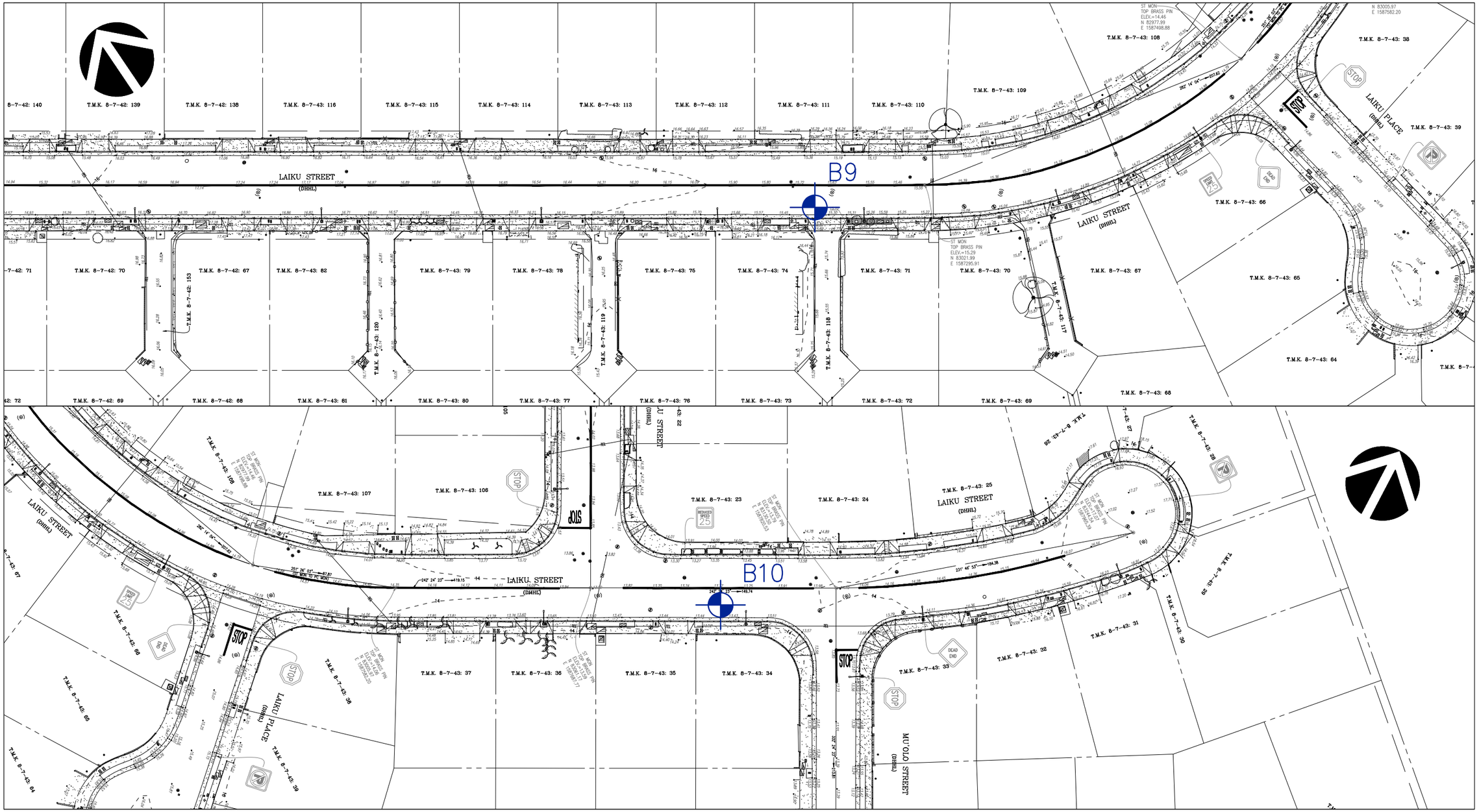
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Geotechnical Engineering

W.O. 20-6556

BORING LOCATION PLAN

Plate A2.4



LEGEND:

Approximate location of borings

Reference: Advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.

GRAPHIC SCALE:

0 30 60 120FT.

1" = 60'

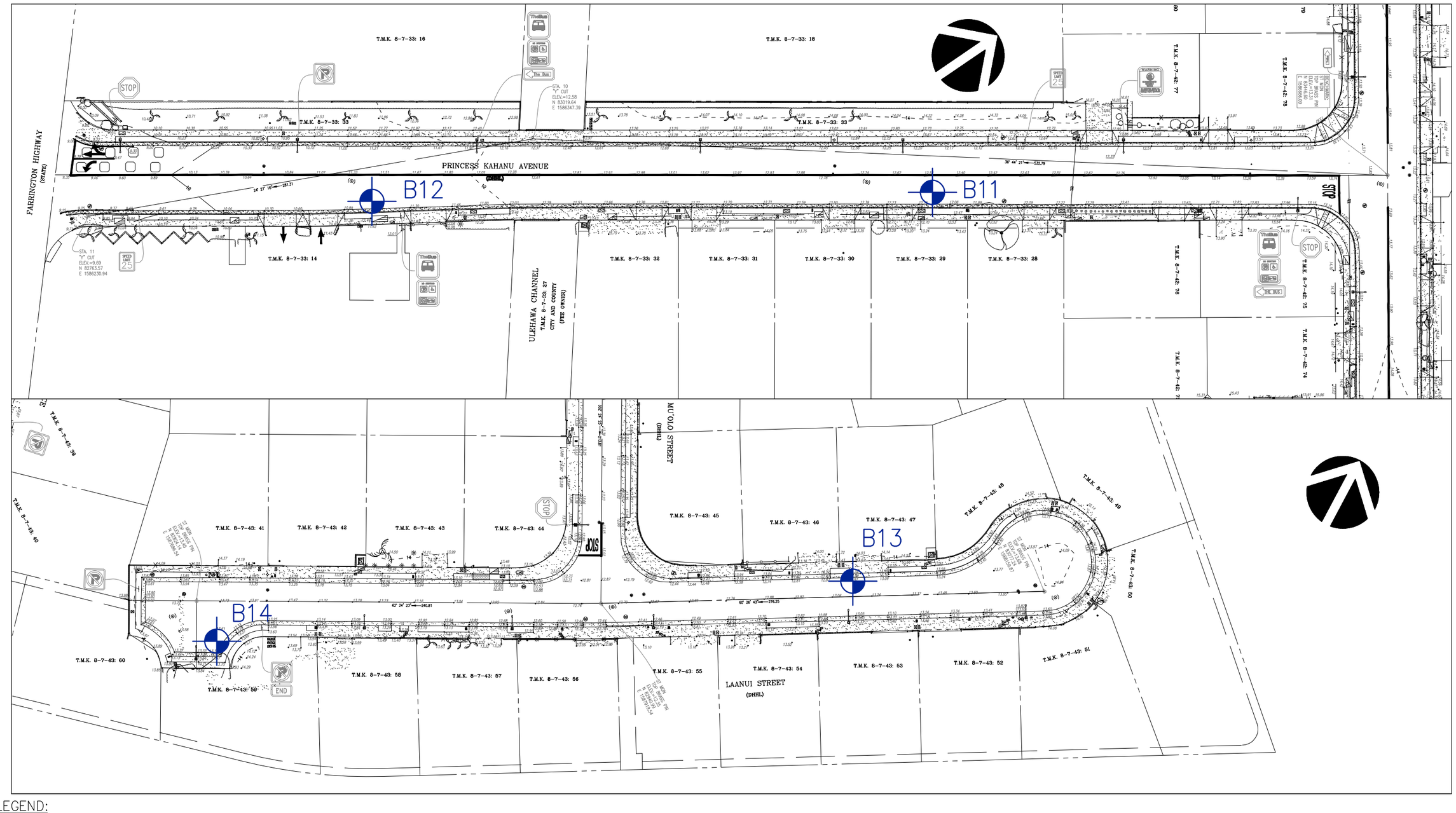
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Geotechnical Engineering

W.O. 20-6556

BORING LOCATION PLAN

Plate A2.5



LEGEND:

Approximate location of borings

Reference: Advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.

GRAPHIC SCALE:

0 30 60 120FT.

1" = 60'

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

BORING LOCATION PLAN

Plate A2.6

MAJOR DIVISIONS			GROUP DIVISIONS		TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)		GW	Well graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)		GM	Silty gravels, gravel-sand-silt mixtures.
				GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)		SM	Silty sands, sand-silt mixtures.
				SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL	Inorganic clays of high plasticity, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50.)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays.
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic silts.
FORMATIONS					FRESH TO MODERATELY WEATHERED BASALT
					VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT
					CORAL

SAMPLE DEFINITION

2" O.D. Standard Split Spoon Sampler	Shelby Tube	RQD: Rock Quality Designation
3" O.D. Split Tube Sampler	Core Sample	Water Table

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

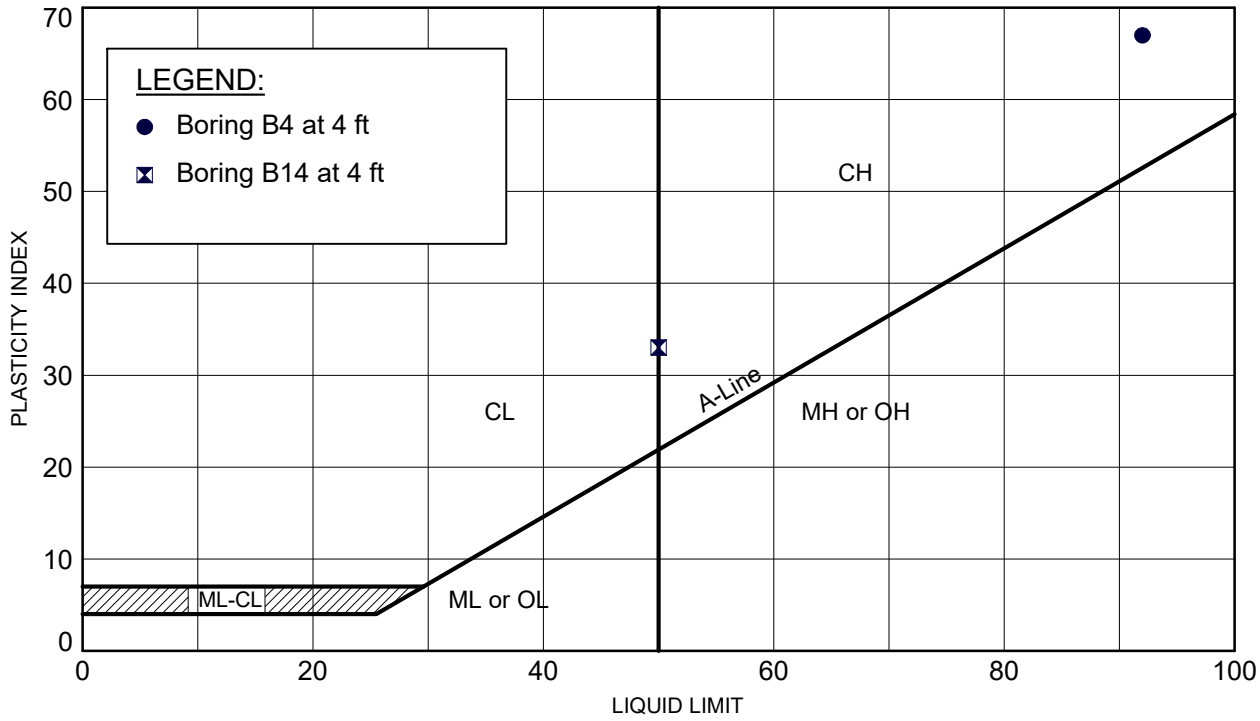
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Geotechnical Engineering

W.O. 20-6556

BORING LOG LEGEND

Plate A3.1

PLASTICITY CHART



GRADATION CHART

COMPONENT DEFINITIONS BY GRADATION	
COMPONENT	SIZE RANGE
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel Coarse Fine Gravel	3 in. to No. 4 (4.76 mm) 3 in. to 3/4 in. 3/4 in. to No. 4 (4.76 mm)
Sand Coarse Sand Medium Sand Fine Sand	No. 4 (4.76 mm) to No. 200 (0.074mm) No. 4 (4.76 mm) to No. 10 (2.0 mm) No. 10 (2.0 mm) to No. 40 (0.42 mm) No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

UNIFIED SOIL CLASSIFICATION SYSTEM

Plate
A3.2

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No. B1

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/26/21
SURFACE ELEV. 20.5 ±* DROP 30 in. END DATE 4/26/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			14	93	13				Clayey Coralline GRAVEL (GC) - Mottled brown and tan, moist, medium dense, with sand. Covered by 3 inches of AC over 3 inches of base material.
			9	88	19	5			Loose to medium dense at 4 feet.
NP = No Penetration			5/6" 10/NP	82	25	10			Silty Coralline Gravel (GM) - Mottled tan, moist, dense, with sand, partially cemented. (Coral Rubblestone)
			60/6"	95	21				
						15			End boring at 13.5 feet.
									Neither groundwater nor seepage water encountered.
									* Elevations based on advance print of topographic survey map prepared by ControlPoint Surveying, Inc., dated 3/2/2021.
						20			
						25			
						30			

Plate A4.1

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B2

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/15/21
SURFACE ELEV. 20 ± DROP 30 in. END DATE 4/15/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			16	94	13				Clayey Coralline GRAVEL (GC) - Brown, moist, medium dense, with sand. Covered by 3.5 inches of AC over 6.5 inches of base material.
			7	103	15				Loose from 3 feet.
			3	95	14	5			Increase in sand content at 5 feet.
			10	92	20	10			
			31	107	13	15			Silty Corallne SAND (SM) - Grayish tan, moist, medium dense, with coral gravel, partially cemented.
									End boring at 15.5 feet. Neither groundwater nor seepage water encountered.
						20			
						25			
						30			

Plate A4.2

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B3

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/26/21
SURFACE ELEV. 17 ± DROP 30 in. END DATE 4/26/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			40	108	14				Clayey Coralline GRAVEL (GC) - Brown, moist, dense, with sand. Covered by 3 inches of AC over 3 inches of base material.
			73	104	16	5			Silty Coralline SAND (SM) - Tan, moist, dense, with coral gravel.
			40/6"	90	19	10			Weathered volcanic tuff fragments from 8.5 to 10.5 feet.
			58	92	13				Coralline SAND (SP) - Tan and gray, dense, partially cemented.
						15			End boring at 14.5 feet. Neither groundwater nor seepage water encountered.
						20			
						25			
						30			

Plate A4.3

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B4

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/15/21
SURFACE ELEV. 17 ± DROP 30 in. END DATE 4/15/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			26	92	18				Clayey Coralline GRAVEL (GC) - Light brown, moist, medium dense, with sand. Covered by 4 inches of AC over 5.5 inches of base material.
			12	71	25	5			
			8	105	6	10			Coralline SAND (SP) - Tan, slightly moist, loose to medium dense, with coral gravel.
			11	49	89				Clayey SILT (MH) - Reddish brown, very moist, medium stiff.
						15			End boring at 14.5 feet. Neither groundwater nor seepage water encountered.
						20			
						25			
						30			

Plate A4.4

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B5

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/26/21
SURFACE ELEV. 15 ± DROP 30 in. END DATE 4/26/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			27/6" 40/3"	109	7				Silty Coralline SAND (SM) - Tan, slightly moist, dense to medium hard, partially cemented, with coral gravel. Covered by 2 inches of AC over 4 inches of base material.
NP = No Penetration			22/6" 10/NP 17	106	7 8				
			14	103	15	5			Clayey Coralline GRAVEL (GC) - Light brown, moist, medium dense, with sand.
			20	109	19	10			Groundwater encountered at 12.9 feet on 4/26/21 at 12:00 pm. Dense to medium hard at 14 feet, cemented sand.
			10/NP						
						15			End boring at 14.0 feet.
						20			
						25			
						30			

Plate A4.5

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B6

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/28/21
SURFACE ELEV. 17 ± DROP 30 in. END DATE 4/28/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			29 39	104 78	8 25				Silty Coralline GRAVEL (GM) - Mottled brown and tan, slightly moist, medium dense, with sand and clay pockets. Covered by 2 inches of AC over 4 inches of base material.
			53	73	48	5			Weathered BASALT (WH) - Mottled brown, moist, dense, highly weathered.
			70/11" 40/3"	99	18 14	10			Silty Coralline SAND (SM) - Mottled tan and gray, moist, dense, partially cemented, with coral gravel, .
						15 20 25 30			End boring at 13.5 feet. Neither groundwater nor seepage water encountered.

Plate A4.6

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No. B7

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/15/21
SURFACE ELEV. 16 ± DROP 30 in. END DATE 4/15/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			38	110	6				Silty GRAVEL (GM) - Grayish brown, slightly moist, medium dense, with sand. Covered by 4 inches of AC over 7 inches of base material.
			11	91	8				Medium dense to loose from 3 feet.
			9	95	6	5			
NP = No Penetration			10/NP						Silty Coralline GRAVEL (GM) - Tan, slightly moist, dense, with sand. (Coral Rubblestone)
			57	92	9	10			
			46	97	20	▼ 15			Groundwater encountered at 14.2 feet on 4/15/21 at 10:25 am.
									End boring at 15.5 feet.
						20			
						25			
						30			

Plate A4.7

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B8

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/27/21
SURFACE ELEV. 14 ± DROP 30 in. END DATE 4/27/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			56	77	34				Silty SAND (SM) - Brown to reddish brown , moist, dense, with coral gravel. Covered by 2 inches of AC over 3 inches of base material.
NP = No Penetration			10/NP						Cobble at 4 feet.
			21	65	38	5			
			10/NP			▼ 10			Silty Coralline SAND (SM) - Gray, moist, dense, partially cemented, with basalt and volcanic tuff fragments. Groundwater encountered at 9.3 feet on 4/27/21 at 11:52 am.
			73/8"	102	23				
						15			End boring at 14.0 feet.
						20			
						25			
						30			

Plate A4.8

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B9

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/27/21
SURFACE ELEV. 15.5 ± DROP 30 in. END DATE 4/27/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			16	86	28				Clayey SILT (MH) - Brown, moist, medium stiff, with coral gravel. Covered by 3 inches of AC over 4.5 inches of base material.
			43	86	21				Silty Coralline SAND (SM) - Tan, moist, dense, with coral gravel.
NP = No Penetration			40/5"	89	20	5			CORAL - Tan, medium hard to hard,
			10/NP			10			
			10/NP						
						15			End boring at 14.0 feet. Neither groundwater nor seepage water encountered.
						20			
						25			
						30			

Plate A4.9

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B10

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/12/21
SURFACE ELEV. 13.5 ± DROP 30 in. END DATE 4/12/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
NP = No Penetration			14/6" 10/NP	93	16				Silty Coralline GRAVEL (GM) - Light brown, moist, medium dense, with sand. Covered by 4 inches of AC over 4 inches of base material.
			35/6" 10/NP	98	6	5			Coralline SAND (SP) - Tan, slightly moist, medium hard to hard,with coral gravel, cemented.
			10/NP			10			
			10/NP			▼			Groundwater encountered at 12 feet on 4/12/21 at 1:20 pm.
						15			End boring at 13.0 feet.
						20			
						25			
						30			

Plate A4.10

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B11

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/12/21
SURFACE ELEV. 12.5 ± DROP 30 in. END DATE 4/12/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			40/6" 50/2"	87	8				Silty Coralline GRAVEL (GM) - Tan, slightly moist, dense, with sand. Covered by 4 inches of AC over 3 inches of base material.
Begin HQ coring at 3 feet.	73 100 100					5 10 15			CORAL - Tan, medium hard to hard, inter-layered with cemented sand.
						20 25 30			End boring at 18.0 feet. Groundwater was measured at 5.7 feet on 4/12/21 at 12:24 pm. However, the depth to groundwater level in the bore hole might have been affected by the water used in the coring operation.

Plate A4.11

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No. B12

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/27/21
SURFACE ELEV. 11 ± DROP 30 in. END DATE 4/27/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
Sample disturbed			21 16 4	102 74	12 10 16	5 10			Silty Coralline GRAVEL (GM) - Light brown to tan, moist, medium dense, with sand. Covered by 5 inches of AC over 6 inches of base material. Loose at 8 feet, clayey. Groundwater encountered at 10 feet on 4/27/21, at 10:00 am.
			17/6" 40/2" 40/2"	97	22 19	15			CORAL - Tan, dense to medium hard.
						20 25 30			End boring at 18.5 feet.

Plate A4.12

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No. B13

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/28/21
SURFACE ELEV. 13 ± DROP 30 in. END DATE 4/28/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			33	88	16				Silty Coralline SAND (SM) - Tan, moist, dense, with coral gravel. Covered by 3.5 inches of AC over 4 inches of base material.
			73/10"	107	14				Increase in coral gravel content from 3 feet.
			35	110	14	5			
			21	101	22	10			With basalt rock fragments at 10 feet. Groundwater encountered at 11.3 feet on 4/28/21, at 9:39 am.
Begin NX coring from 13 feet.	50		26		15	15			CORAL - Tan, medium hard, inter-layered with cemented sand.
						20			End boring at 19.5 feet.
						25			
						30			

Plate A4.13

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No. B14

BORING LOG

PROJECT NAME DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli
WORK ORDER NO. 20-6556 DRIVING WT. 140 lb. START DATE 4/26/21
SURFACE ELEV. 13.5 ± DROP 30 in. END DATE 4/26/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			42	124	9				Clayey Coralline GRAVEL (GC) - Light brown to tan, moist, medium dense to dense, with sand. Covered by 4 inches of AC over 4 inches of base material.
			22	103	21	5			
			52	109	20	▼ 10			Silty Coralline GRAVEL (GM) - Tan and gray, dense, with sand. Groundwater encountered at 9.3 feet on 4/26/21 at 2:00 pm. Medium hard at 11.5 feet.
			10	94	25				Medium dense to loose at 13 feet, clayey. Gray silty clay at 14 feet.
						15			End boring at 14.5 feet.
						20			
						25			
						30			

Plate A4.14

APPENDIX B

LABORATORY TESTING

DESCRIPTION OF LABORATORY TESTING

CLASSIFICATION

Field classification was verified in the laboratory in accordance with the Unified Soil Classification System. Laboratory classification was determined by visual examination, sieve analysis, and Atterberg Limit tests. Atterberg Limit tests were performed in general accordance with ASTM D 4318. Results of Atterberg Limit tests are plotted on Plate A3.2. The final classifications are shown at the appropriate locations on the Boring Logs, Plates A4.1 through A4.14.

MOISTURE-DENSITY

Representative samples were tested for field moisture content and dry unit weight. The dry unit weight was determined in pounds per cubic foot while the moisture content was determined as a percentage of dry weight. Samples were obtained using a 3-inch O.D. split tube sampler. Test results are shown at the appropriate depths on the Boring Logs, Plates A4.1 through A4.14.

CONSOLIDATION

A representative sample was tested for its consolidation characteristics. The test sample was 2.42 inches in diameter and 1 inch high. Porous stones were placed in contact with the top and bottom of the test sample to permit addition and release of pore fluid. Loads were then applied in several increments in a geometric progression, and the resulting deformations recorded at selected time intervals. Test results are plotted on the Consolidation Test Report, Plate B2.1.

SHEAR TESTS

Shear tests were performed in the Direct Shear Machine which is of the strain control type. Each sample was sheared under varying confining loads in order to determine the Coulomb shear strength parameters, cohesion and angle of internal friction. Test results are presented on Plates B3.1 through B3.4.

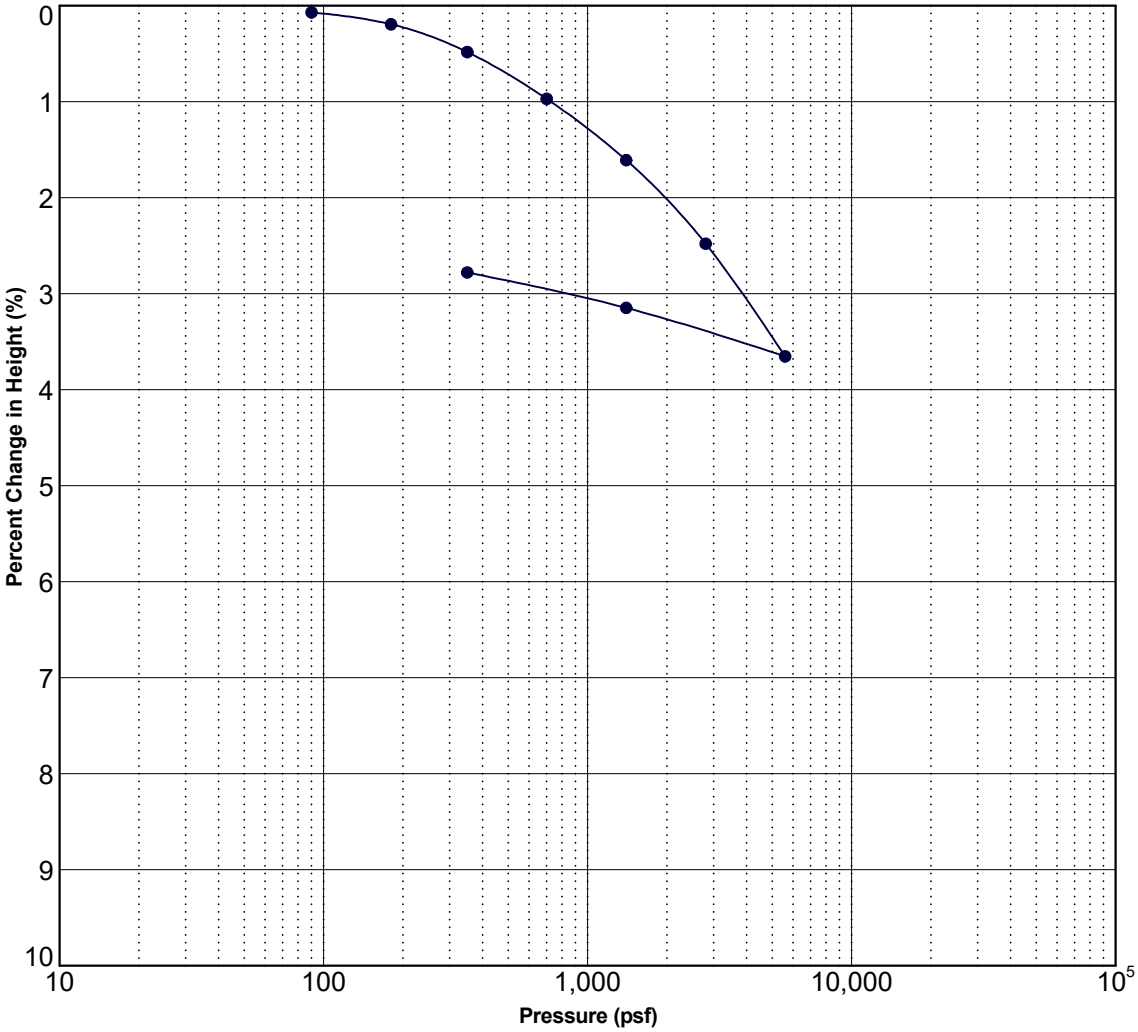
SIEVE ANALYSES

Sieve analyses tests were conducted in general accordance with ASTM D 422. The test is used to determine the grain size distribution. Test results are presented on Plates B4.1 and B4.2.

CALIFORNIA BEARING RATIO TESTS

CBR tests were performed in general accordance with ASTM D 1883 on bulk samples of near surface soil obtained from selected borings. The test is used to evaluate the relative quality of subgrade soils to be used in the design of flexible pavements. Results are shown on Plates B5.1 through B5.4.

Consolidation Test Results



Sample Description

Boring No.: B4 Depth (ft): 13

Soil Description: Reddish brown clayey silt

	Moisture Content (%)	Dry Density (pcf)
Initial	89.3	49.4
Final	83.6	50.8

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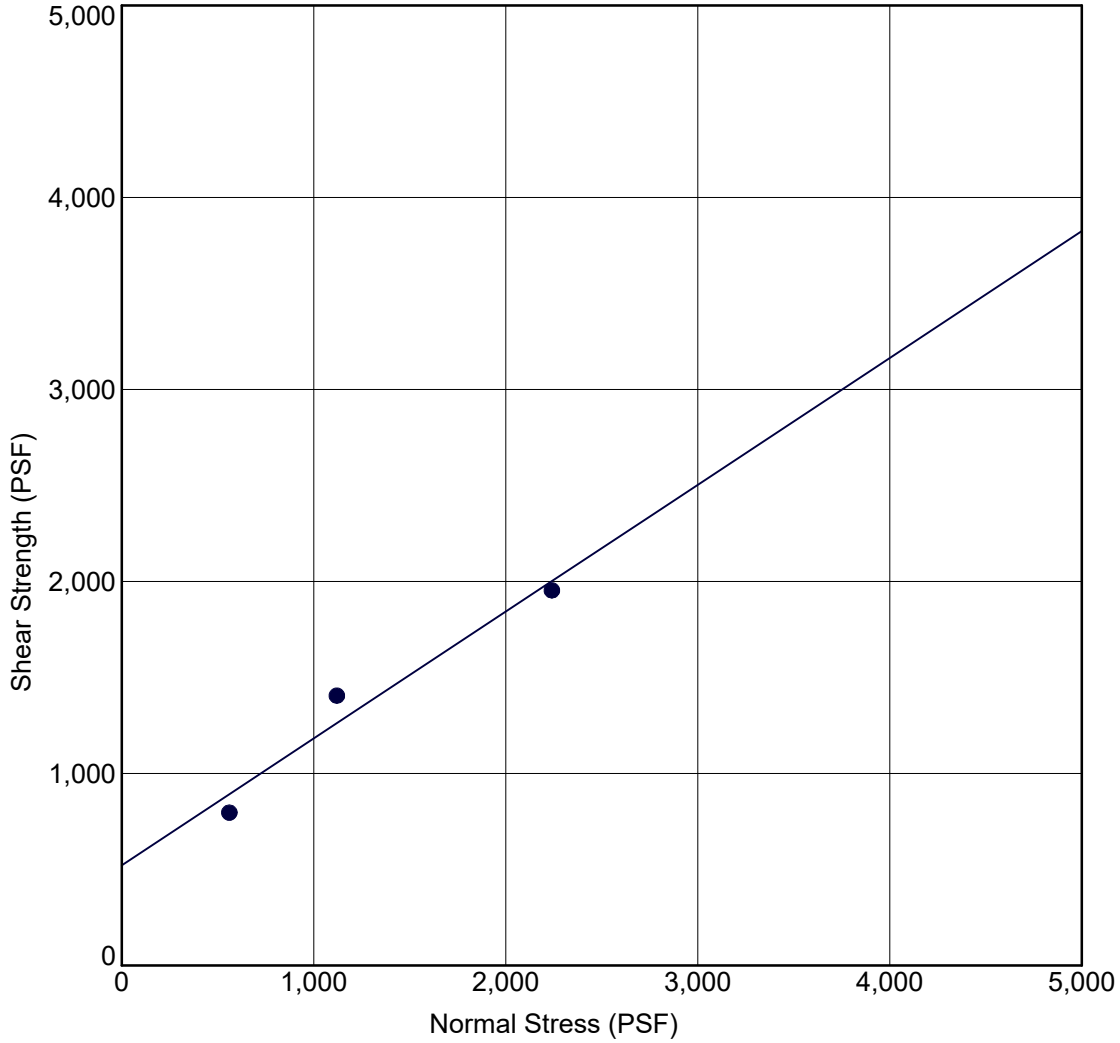
W.O. 20-6556

CONSOLIDATION TEST

ASTM D2435 / D2435M - 11

Plate B2.1

Direct Shear Test Results



Soil Data

Boring No.: B1 Depth (ft): 4

Soil Description: Mottled brown clayey coralline gravel with sand

Test Results

Strength Intercept (c): 522.1 PSF (Peak Strength)

Friction Angle (phi): 33.4 DEG (Peak Strength)

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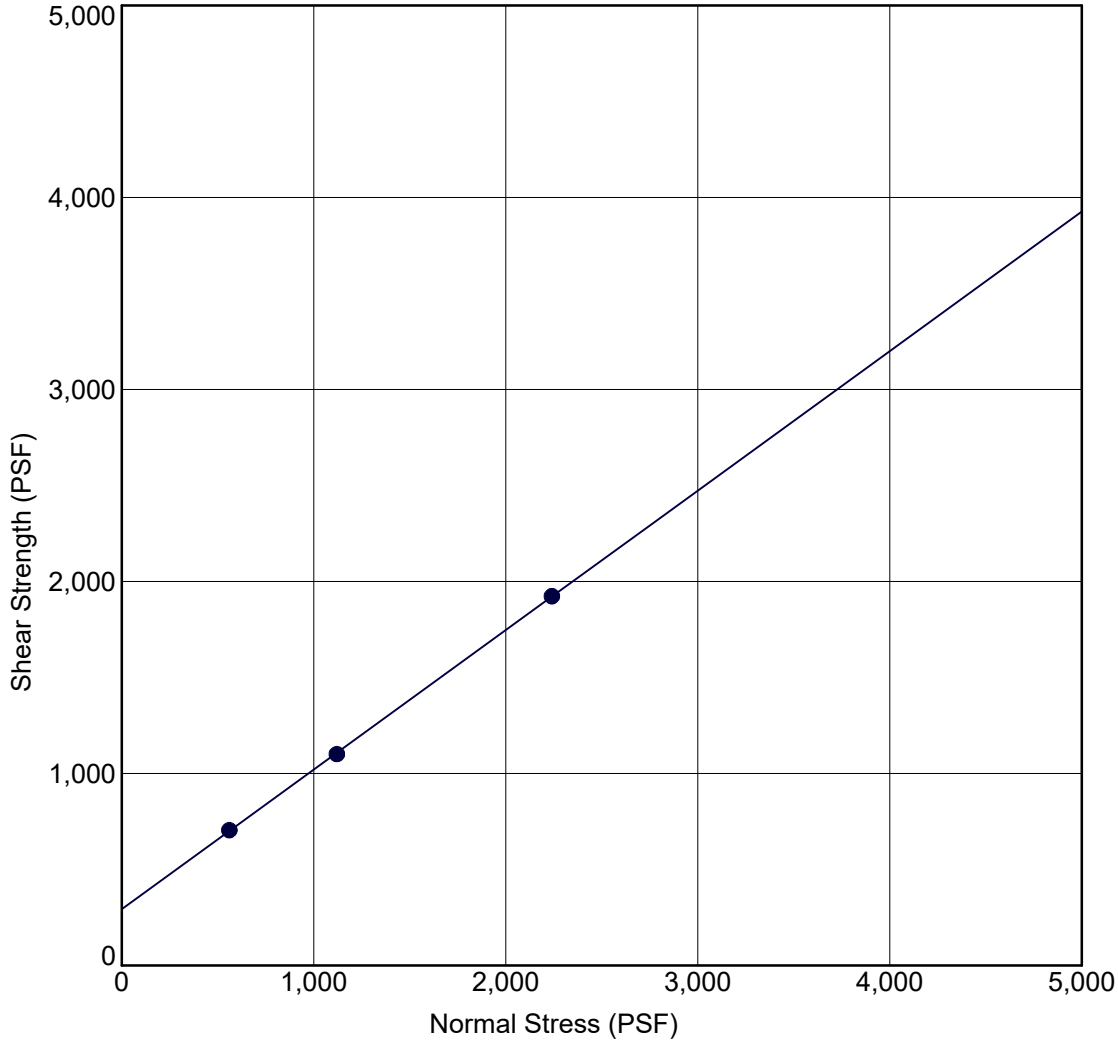
W.O. 20-6556

DIRECT SHEAR TEST

ASTM D3080

Plate B3.1

Direct Shear Test Results



Soil Data

Boring No.: B8 Depth (ft): 4.5
Soil Description: Brown silty sand with gravel

Test Results

Strength Intercept (c): 293.7 PSF (Peak Strength)
Friction Angle (phi): 36.0 DEG (Peak Strength)

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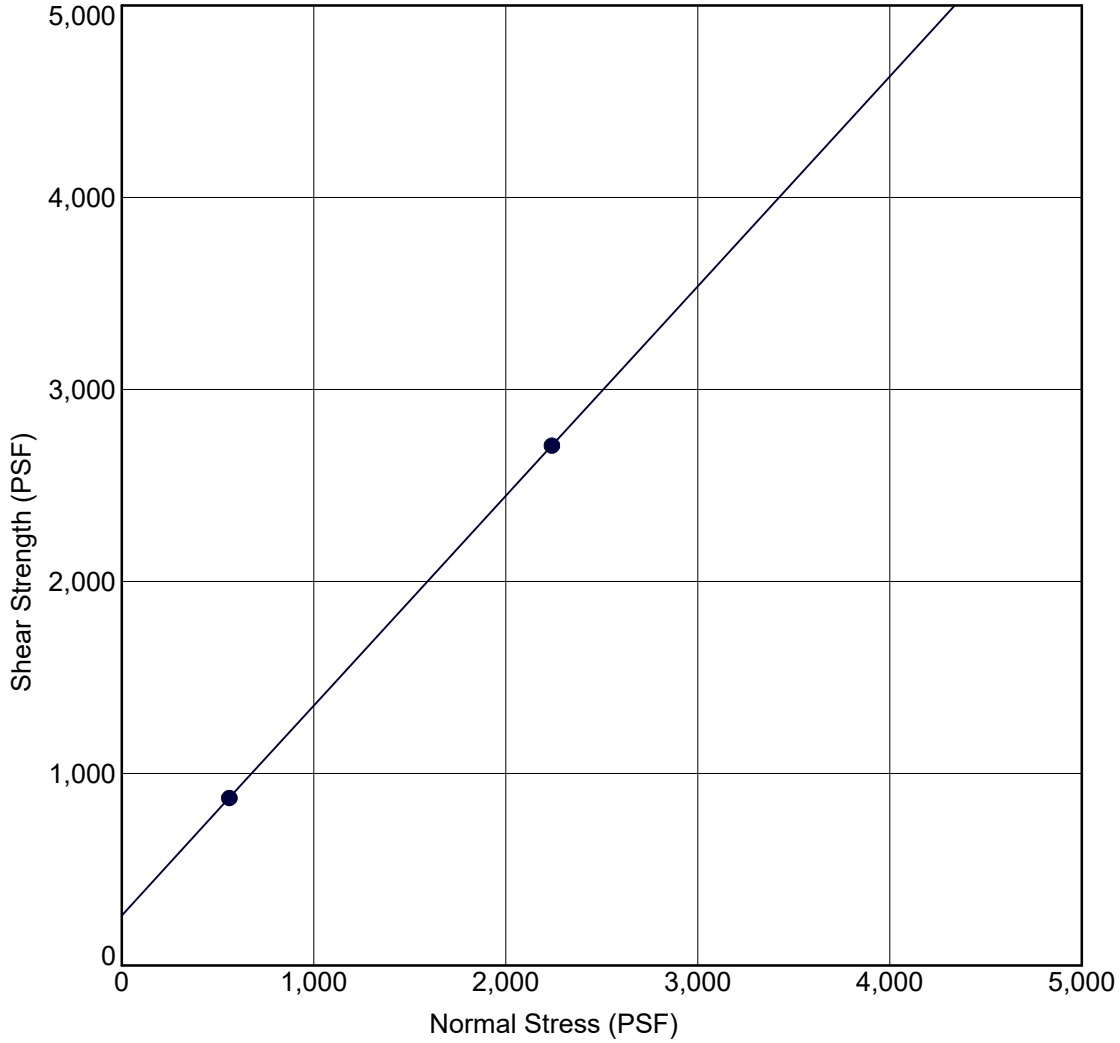
W.O. 20-6556

DIRECT SHEAR TEST

ASTM D3080

Plate
B3.2

Direct Shear Test Results



Soil Data

Boring No.: B12 Depth (ft): 2

Soil Description: Light brown silty coralline gravel with sand

Test Results

Strength Intercept (c): 260.7 PSF (Peak Strength)

Friction Angle (phi): 47.5 DEG (Peak Strength)

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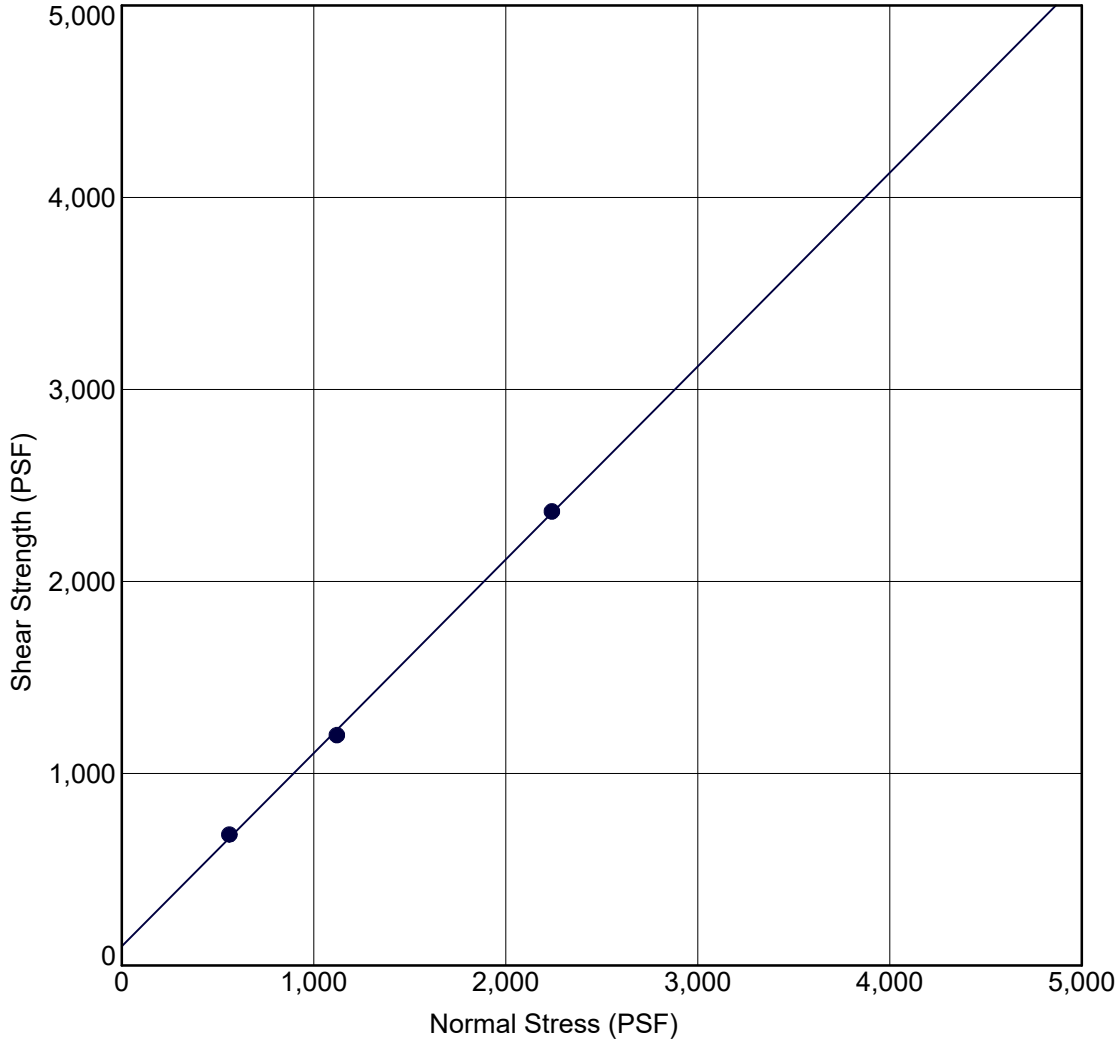
W.O. 20-6556

DIRECT SHEAR TEST

ASTM D3080

Plate B3.3

Direct Shear Test Results



Soil Data

Boring No.: B13 Depth (ft): 5
Soil Description: Tan silty coralline sand with gravel

Test Results

Strength Intercept (c): 99.5 PSF (Peak Strength)
Friction Angle (phi): 45.2 DEG (Peak Strength)

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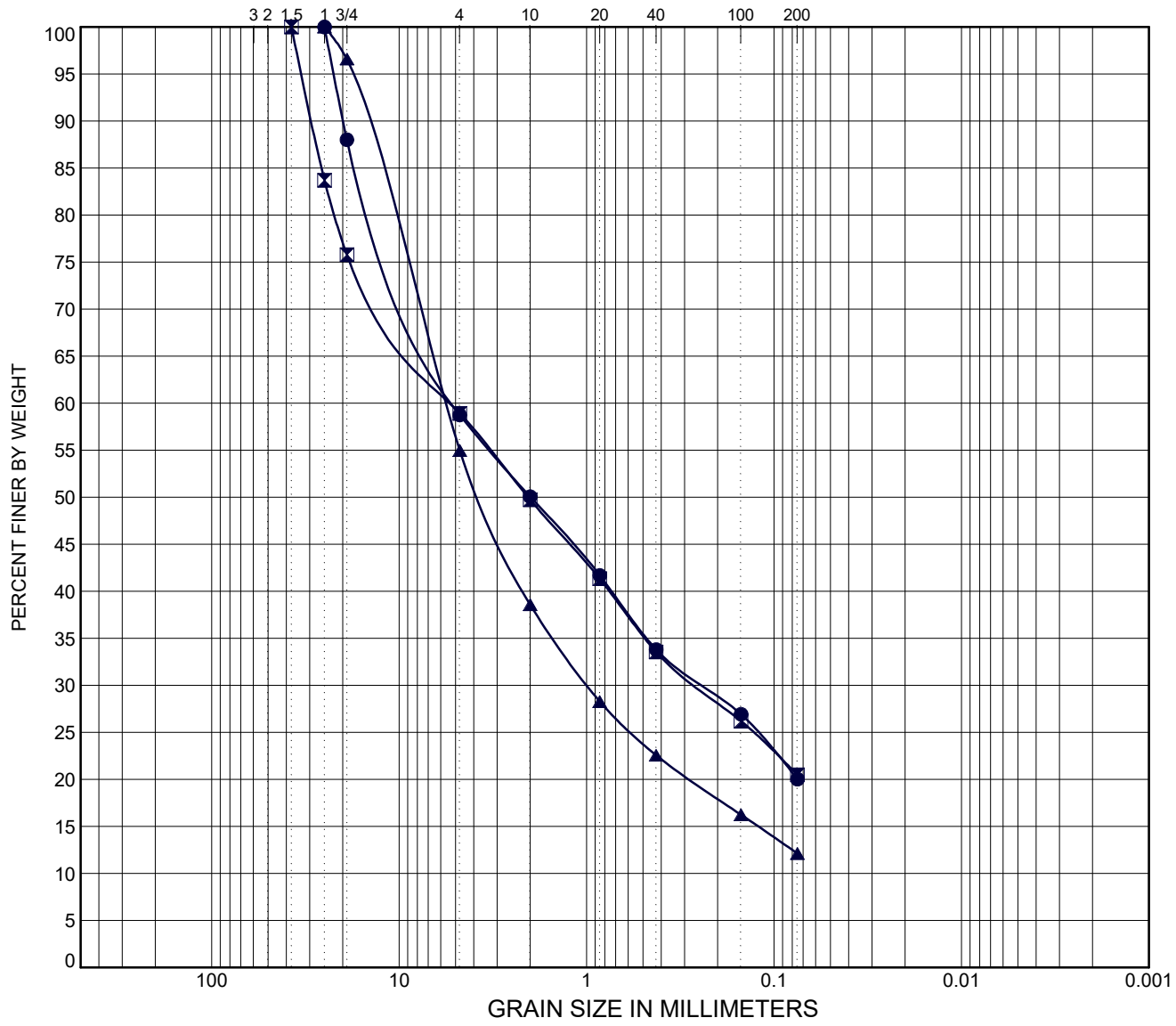
W.O. 20-6556

DIRECT SHEAR TEST

ASTM D3080

Plate
B3.4

U.S. SIEVE OPENING IN INCHES | U.S. SIEVE NUMBERS | HYDROMETER



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Location	Classification	%Gravel	%Sand	%Fines
● Boring B2 at 3 ft	Brown clayey coralline gravel with sand	41.3	38.7	20.0
⊠ Boring B5 at 5 ft	Brown clayey coralline gravel with sand	41.1	38.4	20.5
▲ Boring B7 at 3 ft	Grayish brown silty gravel with sand	45.0	42.9	12.1

Sample Location	D100	D60	D30	D10	Cc	Cu
● Boring B2 at 3 ft	25	5	0.2	*	*	*
⊠ Boring B5 at 5 ft	37.5	5.2	0.3	*	*	*
▲ Boring B7 at 3 ft	25	5.6	1	*	3.27	107.06

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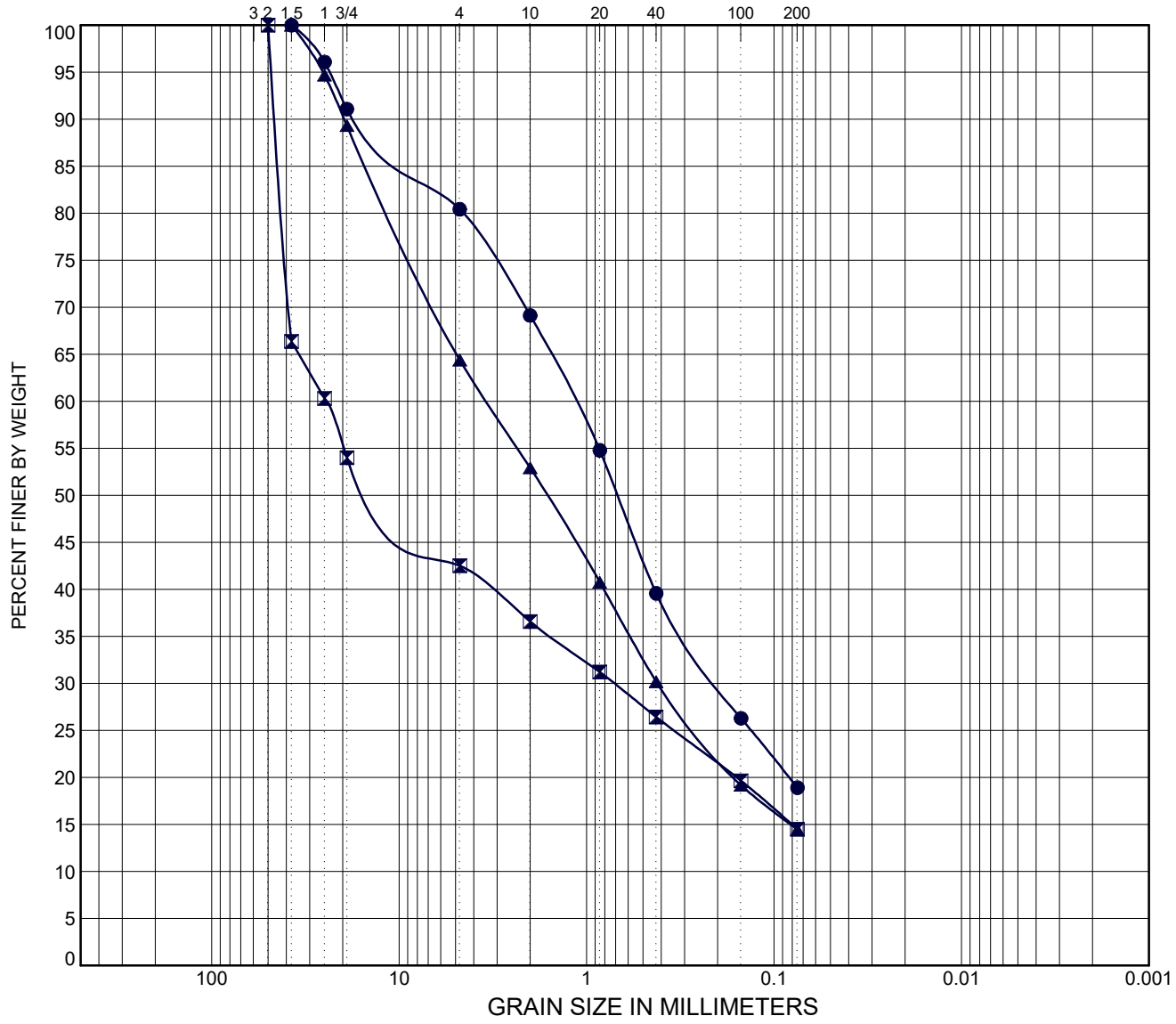
W.O. 20-6556

SIEVE ANALYSIS TEST

ASTM D422

Plate B4.1

U.S. SIEVE OPENING IN INCHES | U.S. SIEVE NUMBERS | HYDROMETER



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Location	Classification	%Gravel	%Sand	%Fines
● Boring B8 at 2 ft	Brown silty sand with gravel	19.6	61.5	18.9
⊠ Boring B12 at 4 ft	Brown silty coralline gravel with sand	57.5	28.0	14.5
▲ Boring B13 at 1 ft	Tan silty coralline sand with gravel	35.6	49.9	14.5

Sample Location	D100	D60	D30	D10	Cc	Cu
● Boring B8 at 2 ft	37.5	1.2	0.2	*	*	*
⊠ Boring B12 at 4 ft	50	24.7	0.7	*	*	*
▲ Boring B13 at 1 ft	37.5	3.4	0.4	*	*	*

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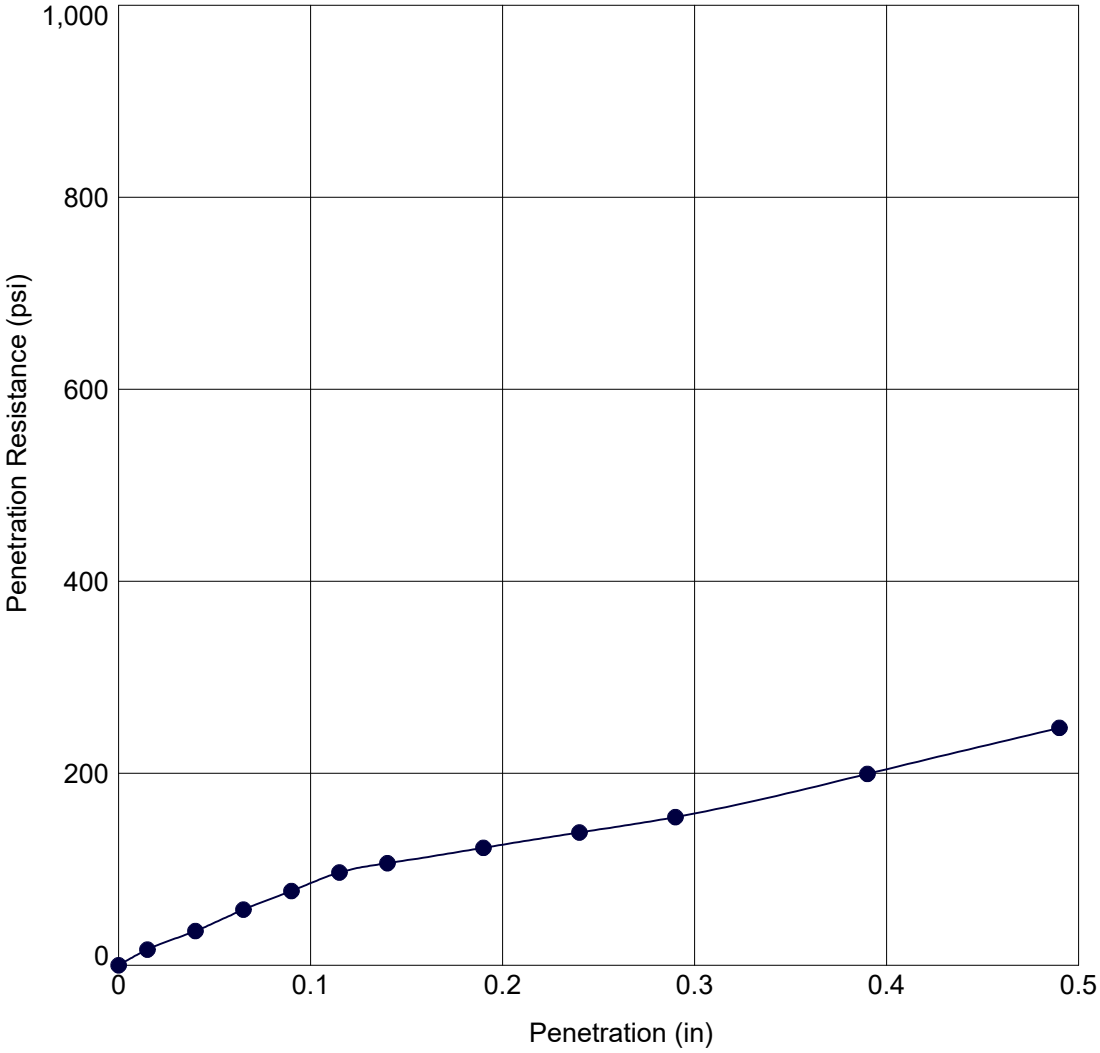
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SIEVE ANALYSIS TEST

ASTM D422

Plate B4.2



Soil Data

Location:	Boring B2 at near surface
Description:	Brown clayey coralline gravel with sand
Sample Dry Density	121.7 pcf
Sample Moisture Content	11.9 %

Test Results

CBR Value:	9.0 %
Expansion:	4.7 %

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

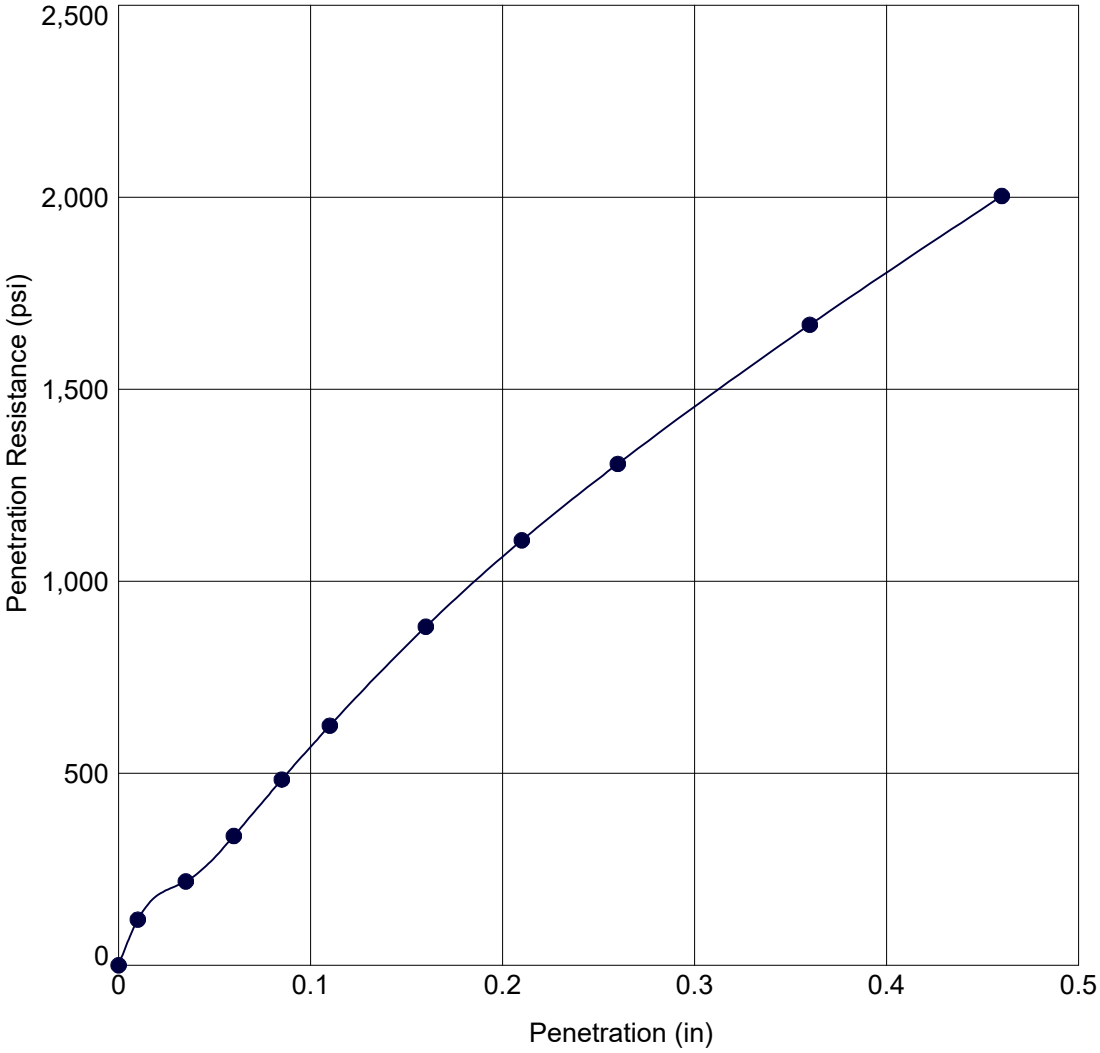
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CBR STRESS PENETRATION TEST

ASTM D1883

Plate B5.1



Soil Data

Location:	Boring B8 at near surface
Description:	Brown silty sand with gravel
Sample Dry Density	126.8 pcf
Sample Moisture Content	11.1 %

Test Results

CBR Value:	56.0 %
Expansion:	0.0 %

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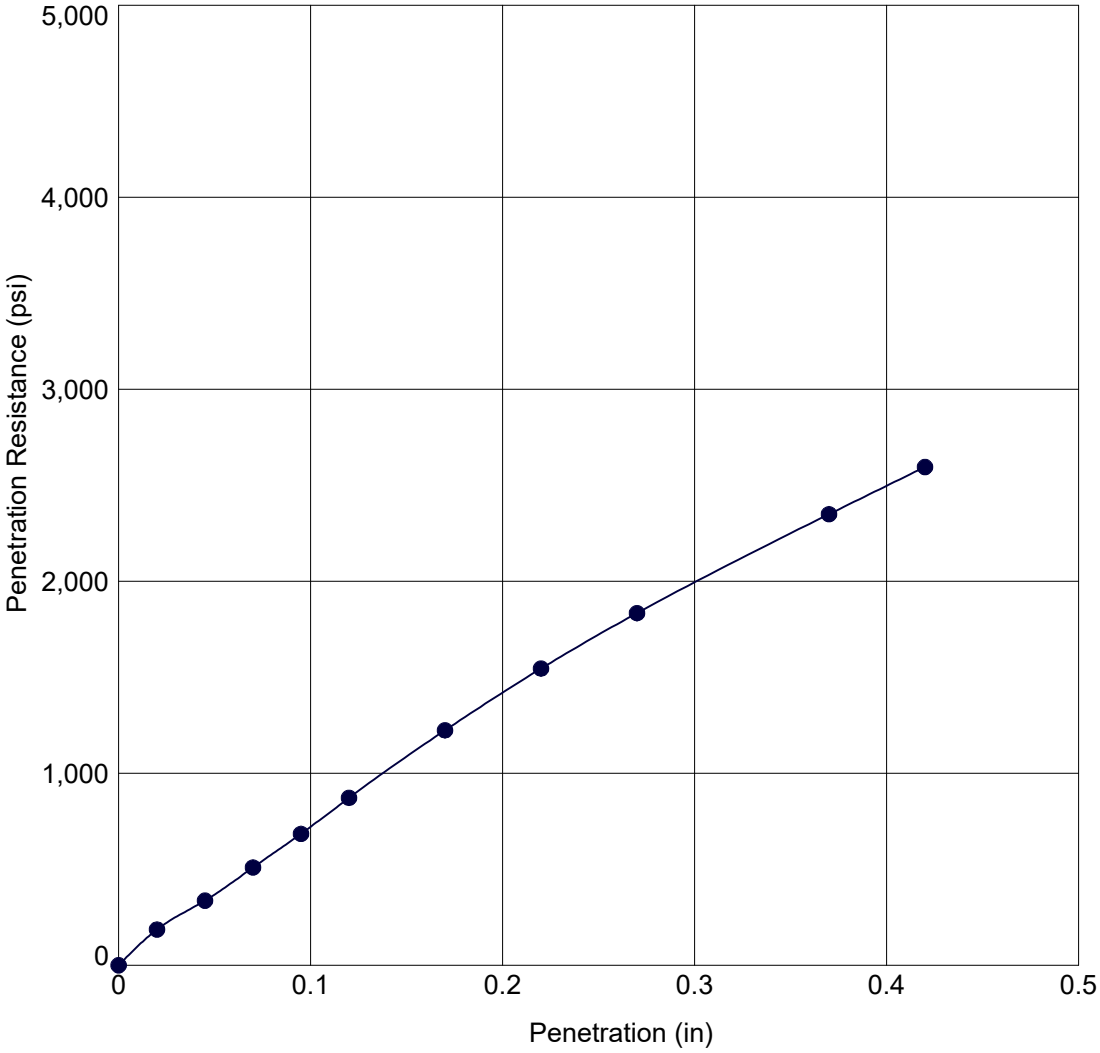
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CBR STRESS PENETRATION TEST

ASTM D1883

Plate B5.2



Soil Data

Location:	Boring B10 at near surface
Description:	Light brown silty coralline gravel with sand
Sample Dry Density	122.0 pcf
Sample Moisture Content	11.2 %

Test Results

CBR Value:	72.5 %
Expansion:	0.0 %

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

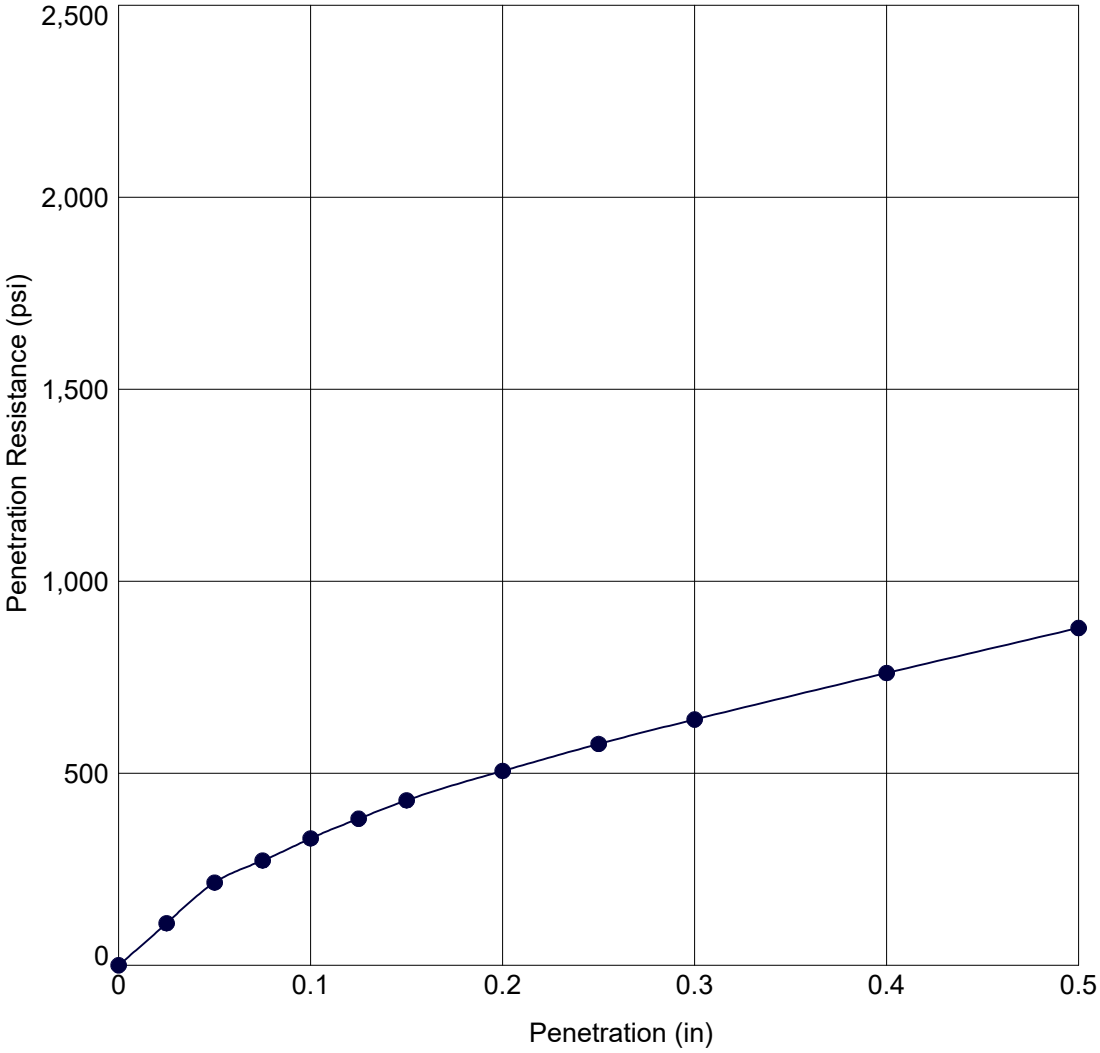
HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

CBR STRESS PENETRATION TEST

ASTM D1883

Plate B5.3



Soil Data

Location:	Boring B12 at near surface
Description:	Light brown silty coralline gravel with sand
Sample Dry Density	124.4 pcf
Sample Moisture Content	11.5 %

Test Results

CBR Value:	33.0 %
Expansion:	0.1 %

DHHL West Oahu Sewer Improvements, Princess Kahanu Estates Subdivision, Nanakuli

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 20-6556

CBR STRESS PENETRATION TEST

ASTM D1883

Plate B5.4

Hirata & Associates
Geotechnical Engineering
Hirata & Associates, Inc.
99-1433 Koaha Pl
Aiea, HI 96701
tel 808.486.0787
fax 808.486.0870

February 15, 2023
W.O. 20-6556

Mr. Wei Chen
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Re: Addendum 1 to Geotechnical Investigation Report
DHHL West Oahu Sewer Improvements
Princess Kahanu Estates, Nanakuli, Hawaii
TMK: Portions of 8-7-042 and 043

If shoring is required, the excavations should be adequately shored to reduce the potential for damage to the surrounding structures, utilities, and roads caused by earth movement toward the excavation. It may be prudent that the ground and structures adjacent to the excavations be continuously monitored by the contractor for signs of ground movements and distress, such as cracks and dips/settlement. A preconstruction survey by the contractor of existing conditions of adjacent structures and buildings is also recommended. All visible defects, cracks, anomalies, and issues that could be affected by the trench excavation activities should be documented and photographed.

In the event that the trench excavations extend below groundwater and dewatering is needed, the dewatering method selected should be designed to have minimal impact on the groundwater level surrounding the excavation. Drawdown of the groundwater table outside of the trench excavations should be kept to less than one foot to reduce the amount of potential ground settlements, movements, and/or distress to existing on-grade supported structures, slabs, pavements, and underground utilities

We appreciate this opportunity to be of service. Should you have any questions concerning this addendum, please feel free to call on us.

Respectfully submitted,

HIRATA & ASSOCIATES, INC.

Con C. Truong, Project Engineer



This work was prepared by me
or under my supervision.
Expiration Date of License:
April 30, 2024

GEOLABS, INC.
Geotechnical Engineering and Drilling Services

September 25, 2023
W.O. 8681-00

Mr. Wei Chen
Fukunaga and Associates Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, HI 96814

GEOTECHNICAL ENGINEERING EXPLORATION
DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

Dear **Mr. Chen:**

In accordance with the scope of services outlined in our fee proposal dated May 5, 2023, we performed a geotechnical engineering exploration in support of the DHHL West Oahu Sewer Improvements project located in the Waianae area on the Island of Oahu, Hawaii, as shown on the Project Location Map, Plate 1. This report summarizes the findings and recommendations for the project. The findings and recommendations presented herein are intended to support the corrosivity evaluation of the project and are subject to the limitations noted at the end of this report.

PROJECT CONSIDERATIONS

The project site is located within the DHHL West Oahu subdivision. It is proposed to improve the sewer system. Details of the improvement project were not available at the time this report was prepared. We understand that it requires laboratory corrosivity testing, including for pH, resistivity, chloride, and sulfate concentrations.

FIELD EXPLORATION

We explored the subsurface conditions at the project site by drilling and sampling two borings, designated as Boring No. 1 and 2, extending to the maximum depth explored of about 8 feet below the existing ground surface. The approximate boring location is shown on the Site Plan, Plate 2. The boring was drilled using a truck-mounted drill rig equipped with continuous flight augers.

Our geologist classified the materials encountered in the boring by visual and textural examination in the field in general accordance with ASTM D2488, Standard Practice for Description and Identification of Soils, and monitored the drilling operations on a near-continuous (full-time) basis. These classifications were further reviewed visually and by testing in the laboratory. Soils were classified in general accordance with ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil

Classification System), as shown on the Soil Log Legend, Plate 3.1. Deviations made to the soil classification in accordance with ASTM D2487 are described on the Soil Classification Log Key, Plate 3.2. Rock samples were described in general accordance with the Rock Description System, as shown on the Rock Log Legend, Plate 3.3. Graphic representations of the materials encountered are presented on the Log of Boring, Plates 3.4 and 3.5.

Relatively "undisturbed" soil samples were obtained in general accordance with ASTM D3550, Ring-Lined Barrel Sampling of Soils, by driving a 3-inch OD Modified California sampler with a 140-pound hammer falling 30 inches. In addition, some samples were obtained from the drilled boring in general accordance with ASTM D1586, Penetration Test and Split-Barrel Sampling of Soils, by driving a 2-inch OD standard penetration sampler using the same hammer and drop. The blow counts needed to drive the sampler the second and third 6 inches of an 18-inch drive are shown as the "Penetration Resistance" on the Log of Boring at the appropriate sample depths. The penetration resistance shown on the Log of Boring indicates the number of blows required for the specific sampler type used. The blow counts may need to be factored in to obtain the Standard Penetration Test (SPT) blow counts.

LABORATORY TESTS

The following laboratory testing was preformed in support of the soil classification and characteristics.

Moisture Content (ASTM D2216) and Unit Weight (ASTM D2937) determinations were performed on selected samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Log of Boring at the appropriate sample depths.

Four sieve analysis tests (ASTM C 136 & ASTM D 1140) were performed on selected soil samples to evaluate the gradation characteristics of the soils and to aid in soil classification. Graphic presentation of the grain size distribution is provided on Plate 4.1.

Four sets of Corrosivity tests, including pH (ASTM G51), Minimum Resistivity (ASTM G57), Chloride Content (EPA 300.0), and Sulfate Content (EPA 300.0), were performed by our office and CERCO Analytical, Inc., on selected soil samples obtained from our field exploration. The test results are summarized on Plate 4.2.

CORROSION POTENTIAL

Resistivity is generally recognized as one of the most significant soil characteristics regarding the corrosivity of the soil to buried metallic objects. In general, the lower the resistivity, the greater the potential for corrosion of the buried metallic structure. Conversely, the higher the resistivity, the less likely the soil will contribute to the corrosion of metallic objects. Results of the laboratory testing indicate that the on-site soils have resistivity values ranging from approximately 5,500 to 11,000 ohm-cm with pH values of between 8.3 to 10

within the upper 10 feet of soils. Therefore, the on-site near-surface soils may be considered to be mild to moderately corrosive (Corrosion Rating of 4 to 5) to buried metallic structures.

Chloride content and sulfate content testing were performed by CERCO Analytical, Inc. to evaluate the corrosivity of the on-site soils encountered. Based on the chloride and sulfate content tests performed on the on-site soils, the test values are less than 40 parts per million (ppm) for chloride and sulfate contents, considering no detection.

It should be noted that the laboratory resistivity testing was conducted under fully saturated soil samples and the testing results present the most extreme design condition. Therefore, we recommend properly designing near-surface metallic substructures (such as piping) for protection against the potential for corrosion. It may be appropriate to consult with a professional corrosion engineer to review the test results and provide detailed recommendations for corrosion protection.

LIMITATIONS

The analyses and findings submitted herein are based, in part, upon information obtained from our field borings. Variations of subsoil conditions beyond the field boring may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, it will be necessary to re-evaluate the recommendations provided herein.

The field boring location indicated in this report was located using the Topographic Plan transmitted by Fukunaga and Associates, Inc. on May 16, 2023. The elevation of the boring was estimated by using the same drawing referenced above. The location and elevation of the field boring should be considered accurate only to the degree implied by the methods used.

The stratification breaks shown on the graphic representations of the boring depict the approximate boundaries between soil types and, as such, may denote a gradual transition. We did not encounter groundwater in the drilled borings at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

This report has been prepared for the exclusive use of Fukunaga and Associates, Inc. for specific application to the *DHHL West Oahu Sewer Improvements* project in accordance with generally accepted geotechnical engineering principles and practices. No warranty is expressed or implied.

This report has been prepared solely for the purpose of assisting the design engineers for the proposed project. Therefore, this report may not contain sufficient data or the proper information to serve as the basis for construction cost estimates or for bidding purposes. A contractor wishing to bid on this project should retain a competent geotechnical engineer to assist in the interpretation of this report and/or in the performance of additional site-specific exploration for bid estimating purposes.

The owner/client should be aware that unanticipated soil conditions are commonly encountered. Unforeseen soil conditions, such as perched groundwater, soft deposits, hard layers, or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

This geotechnical engineering exploration conducted at the project site was not intended to investigate the potential presence of hazardous materials and/or archeological features existing at the site. It should be noted that the equipment, techniques, and personnel used to conduct a geo-environmental exploration differ substantially from those applied in geotechnical engineering.

CLOSURE

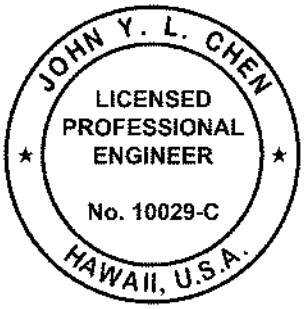
We appreciate the opportunity to provide our services to you on this project. If you have questions or need additional information, please contact our office.

Respectfully submitted,

GEOLABS, INC.

By _____
John Y.L. Chen, P.E.
Vice President

JC:TO:jc



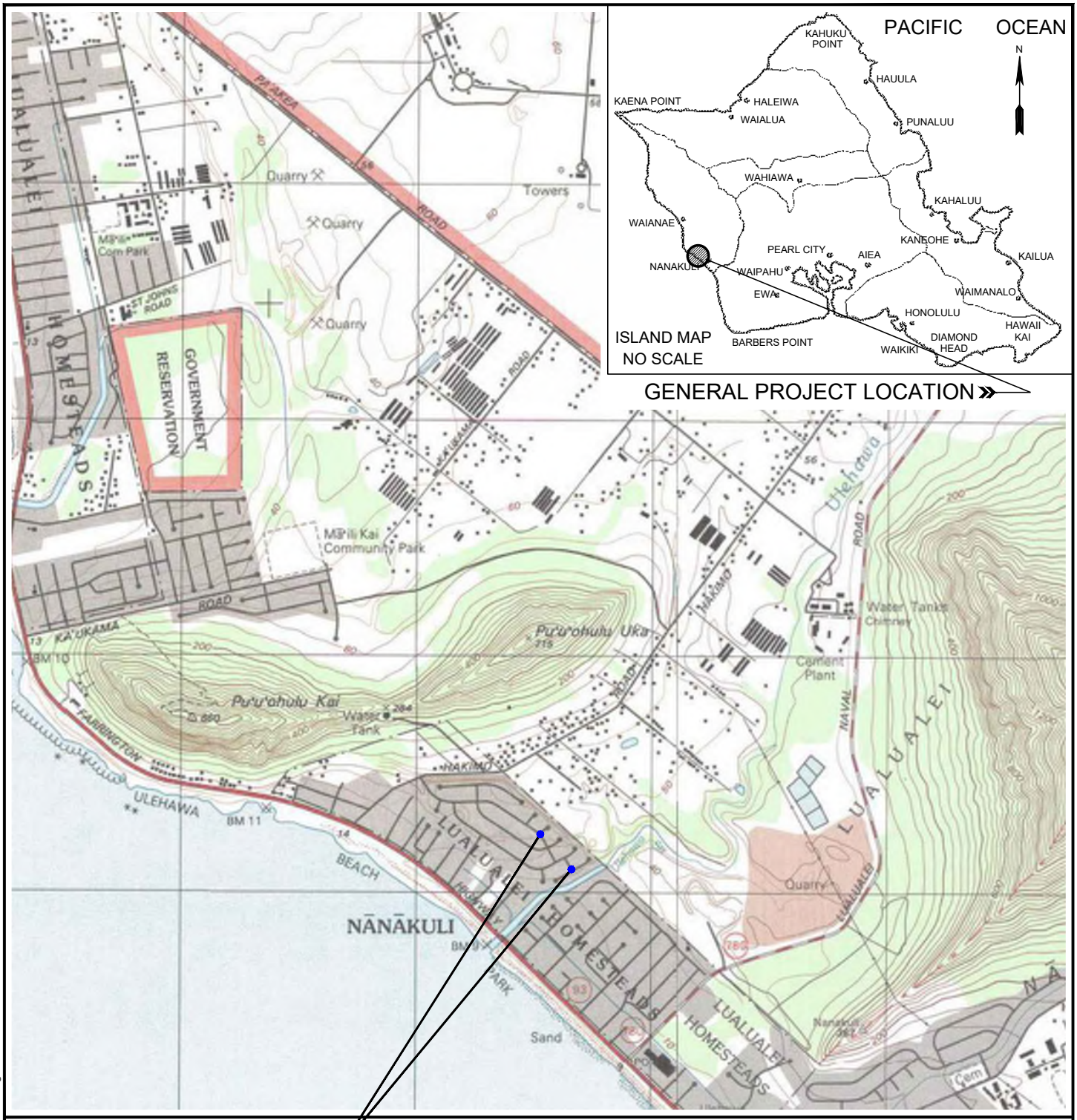
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

_____ 4-30-24
SIGNATURE EXPIRATION DATE
OF THE LICENSE

Attachments: **PLATES**
Project Location Map, Plate 1
Site Plan, Plate 2
Soil Log Legend and Soil Classification Log Key, Plates 3.1 and 3.2
Rock Log Legend, Plate 3.3
Log of Boring, Plates 3.4 and 3.5
Laboratory Test Data, Plates 4.1 and 4.2

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PLATES



PROJECT LOCATION MAP

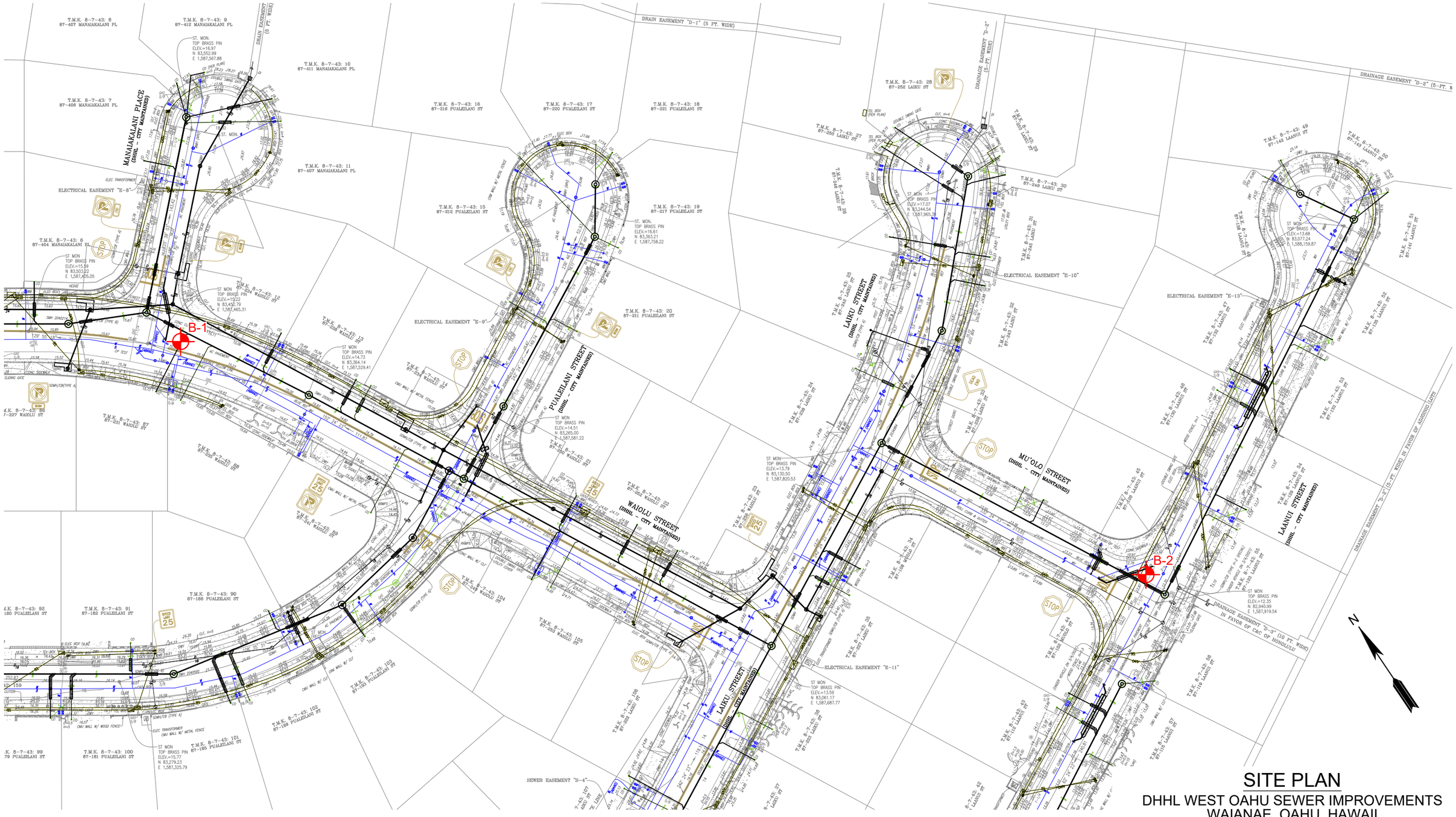
DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

REFERENCE: MAP CREATED WITH TOPO!® ©2010 NATIONAL GEOGRAPHIC; ©2007 TELE ATLAS, REL. 1/2007.

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Geotechnical Engineering

DATE	DRAWN BY	PLATE
SEPTEMBER 2023	HYC	1
SCALE	W.O.	
1" = 2,000'	8681-00	

CAD User: HENRY File Last Updated: September 15, 2023 1:59:44pm Plot Date: September 15, 2023 - 1:59:51pm
File: B:\Drafting\Working\8681-00_DHHL_West_Oahu_Sewer_Improvements\8681-00PLM.dwg\1
Plotter: DWG To PDF-GEO.pc3 Plotstyle: GEO-No-Dithering-Blue-Boring.ctb



SITE PLAN

DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

LEGEND:

APPROXIMATE BORING LOCATION

REFERENCE: TOPOGRAPHIC SURVEY MAP TRANSMITTED BY FUKUNAGA AND ASSOCIATES, INC. ON MAY 16, 2023.

0 20 40 60 120 180 FT.

GRAPHIC SCALE

GEOLABS, INC.
Geotechnical Engineering

DATE	DRAWN BY	PLATE
SEPTEMBER 2023	HYC	2
SCALE	W.O.	
1" = 60'	8681-00	

CAD User: HENRY File Last Updated: September 15, 2023 12:37:13pm Plot Date: September 15, 2023 - 12:37:34pm
File: B:\Drafting\Drafting\Working\8681-00_DHHL_West_Oahu_Sewer_Improvements\8681-00SitePlan.dwg\2
Plotter: DWG To PDF-GEO.pc3 Plotstyle: FAINC_Half Size.ctb

GEOLABS, INC.

Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		LESS THAN 5% FINES	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		MORE THAN 12% FINES	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	SANDS	CLEAN SANDS	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		LESS THAN 5% FINES	SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
		MORE THAN 12% FINES	SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE	MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

- (2-INCH) O.D. STANDARD PENETRATION TEST
- (3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE
- SHELBY TUBE SAMPLE
- GRAB SAMPLE
- CORE SAMPLE
- WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING
- WATER LEVEL OBSERVED IN BORING AFTER DRILLING
- WATER LEVEL OBSERVED IN BORING OVERNIGHT

LL	LIQUID LIMIT (NP=NON-PLASTIC)
PI	PLASTICITY INDEX (NP=NON-PLASTIC)
TV	TORVANE SHEAR (tsf)
UC	UNCONFINED COMPRESSION OR UNIAXIAL COMPRESSIVE STRENGTH
TXUU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate

3.1

GEOLABS, INC.

Geotechnical Engineering

Soil Classification Log Key

(with deviations from ASTM D2488)

GEOLABS, INC. CLASSIFICATION*

GRANULAR SOIL (- #200 <50%)

- **PRIMARY** constituents are composed of the largest percent of the soil mass. Primary constituents are capitalized and bold (i.e., **GRAVEL, SAND**)
- **SECONDARY** constituents are composed of a percentage less than the primary constituent. If the soil mass consists of 12 percent or more fines content, a cohesive constituent is used (**SILTY** or **CLAYEY**); otherwise, a granular constituent is used (**GRAVELLY** or **SANDY**) provided that the secondary constituent consists of 20 percent or more of the soil mass. Secondary constituents are capitalized and bold (i.e., **SANDY** GRAVEL, **CLAYEY** SAND) and precede the primary constituent.
- **accessory descriptions** compose of the following:
  with some: >12%
  with a little: 5 - 12%
  with traces of: <5%
  accessory descriptions are lower cased and follow the Primary and Secondary Constituents
  (i.e., SILTY GRAVEL **with a little sand**)

COHESIVE SOIL (- #200 ≥ 50%)

- **PRIMARY** constituents are based on plasticity. Primary constituents are capitalized and bold (i.e., **CLAY, SILT**)
- **SECONDARY** constituents are composed of a percentage less than the primary constituent, but more than 20 percent of the soil mass. Secondary constituents are capitalized and bold (i.e., **SANDY** CLAY, **SILTY** CLAY, **CLAYEY** SILT) and precede the primary constituent.
- **accessory descriptions** compose of the following:
  with some: >12%
  with a little: 5 - 12%
  with traces of: <5%
  accessory descriptions are lower cased and follow the Primary and Secondary Constituents
  (i.e., SILTY CLAY **with some sand**)

EXAMPLE: Soil Containing 60% Gravel, 25% Sand, 15% Fines. Described as: **SILTY GRAVEL** with some sand

RELATIVE DENSITY / CONSISTENCY

Granular Soils			Cohesive Soils			
N-Value (Blows/Foot)		Relative Density	N-Value (Blows/Foot)		PP Readings (tsf)	Consistency
SPT	MCS		SPT	MCS		
0 - 4	0 - 7	Very Loose	0 - 2	0 - 4		Very Soft
4 - 10	7 - 18	Loose	2 - 4	4 - 7	< 0.5	Soft
10 - 30	18 - 55	Medium Dense	4 - 8	7 - 15	0.5 - 1.0	Medium Stiff
30 - 50	55 - 91	Dense	8 - 15	15 - 27	1.0 - 2.0	Stiff
> 50	> 91	Very Dense	15 - 30	27 - 55	2.0 - 4.0	Very Stiff
			> 30	> 55	> 4.0	Hard

MOISTURE CONTENT DEFINITIONS

Dry: Absence of moisture, dry to the touch

Moist: Damp but no visible water

Wet: Visible free water

ABBREVIATIONS

WOH: Weight of Hammer

WOR: Weight of Drill Rods

SPT: Standard Penetration Test Split-Spoon Sampler

MCS: Modified California Sampler

PP: Pocket Penetrometer

GRAIN SIZE DEFINITION

Description	Sieve Number and / or Size
Boulders	> 12 inches (305-mm)
Cobbles	3 to 12 inches (75-mm to 305-mm)
Gravel	3-inch to #4 (75-mm to 4.75-mm)
Coarse Gravel	3-inch to 3/4-inch (75-mm to 19-mm)
Fine Gravel	3/4-inch to #4 (19-mm to 4.75-mm)
Sand	#4 to #200 (4.75-mm to 0.075-mm)
Coarse Sand	#4 to #10 (4.75-mm to 2-mm)
Medium Sand	#10 to #40 (2-mm to 0.425-mm)
Fine Sand	#40 to #200 (0.425-mm to 0.075-mm)

Soil descriptions are based on ASTM D2488-09a, Visual-Manual Procedure, with the above modifications by Geolabs, Inc. to the Unified Soil Classification System (USCS).

Plate

3.2

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Rock Log Legend

ROCK DESCRIPTIONS

	**BASALT**		**CONGLOMERATE**
	**BOULDERS**		**LIMESTONE**
	**BRECCIA**		**SANDSTONE**
	**CLINKER**		**SILTSTONE**
	**COBBLES**		**TUFF**
	**CORAL**		**VOID/CAVITY**

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock:

Massive: Greater than 24 inches apart

Slightly Fractured: 12 to 24 inches apart

Moderately Fractured: 6 to 12 inches apart

Closely Fractured: 3 to 6 inches apart

Severely Fractured: Less than 3 inches apart

DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered: Rock shows no sign of discoloration or loss of strength.

Slightly Weathered: Slight discoloration inwards from open fractures.

Moderately Weathered: Discoloration throughout and noticeably weakened though not able to break by hand.

Highly Weathered: Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.

Extremely Weathered: Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS

The following terms describe the resistance of a rock to indentation or scratching:

Very Hard: Specimen breaks with difficulty after several "pinging" hammer blows.
Example: Dense, fine grain volcanic rock

Hard: Specimen breaks with some difficulty after several hammer blows.
Example: Vesicular, vugular, coarse-grained rock

Medium Hard: Specimen can be broked by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce.
Example: Porous rock such as clinker, cinder, and coral reef

Soft: Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot.
Example: Weathered rock, chalk-like coral reef

Very Soft: Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure.
Example: Saprolite

Plate

3.3

GEOLABS, INC.

Geotechnical Engineering

DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

Log of Boring

B-1

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS

Approximate Ground Surface Elevation (feet): 15.4 *

Description

Other Tests	Moisture Content (%)	Dry Density (pcf)	Depth (feet)	Sample	USCS	Description
			0			4-inch **ASPHALTIC CONCRETE**
					GP	Gray **SANDY GRAVEL (BASALTIC)**, moist (fill)
					ML	Reddish brown **SANDY SILT** with some gravel, moist (fill)
Sieve - #200 = 40.2%	12			G	SM	Tan **SILTY SAND (CORALLINE)** with a little gravel (coralline), moist (fill)
				G	SM	Tan **SILTY SAND** with some gravel, loose to medium dense, moist (coralline detritus)
Sieve - #200 = 30.2%	13	108	5			
	14					
						Boring terminated at 8 feet
						* Elevations estimated from Topographic Survey Map transmitted by Fukunaga and Associates, Inc. on May 16, 2023.
			10			
			15			

Date Started:	August 11, 2023	Water Level: ▼	Not Encountered	Plate
Date Completed:	August 11, 2023			
Logged By:	B. Aiu	Drill Rig:	CME-55D *(Energy Transfer Ratio = 77.2%)*	3.4
Total Depth:	8 feet	Drilling Method:	4" Solid-Stem Auger	
Work Order:	8681-00	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 8681-00.GPJ GEOLABS.GDT 9/15/23

GEOLABS, INC.

Geotechnical Engineering

DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

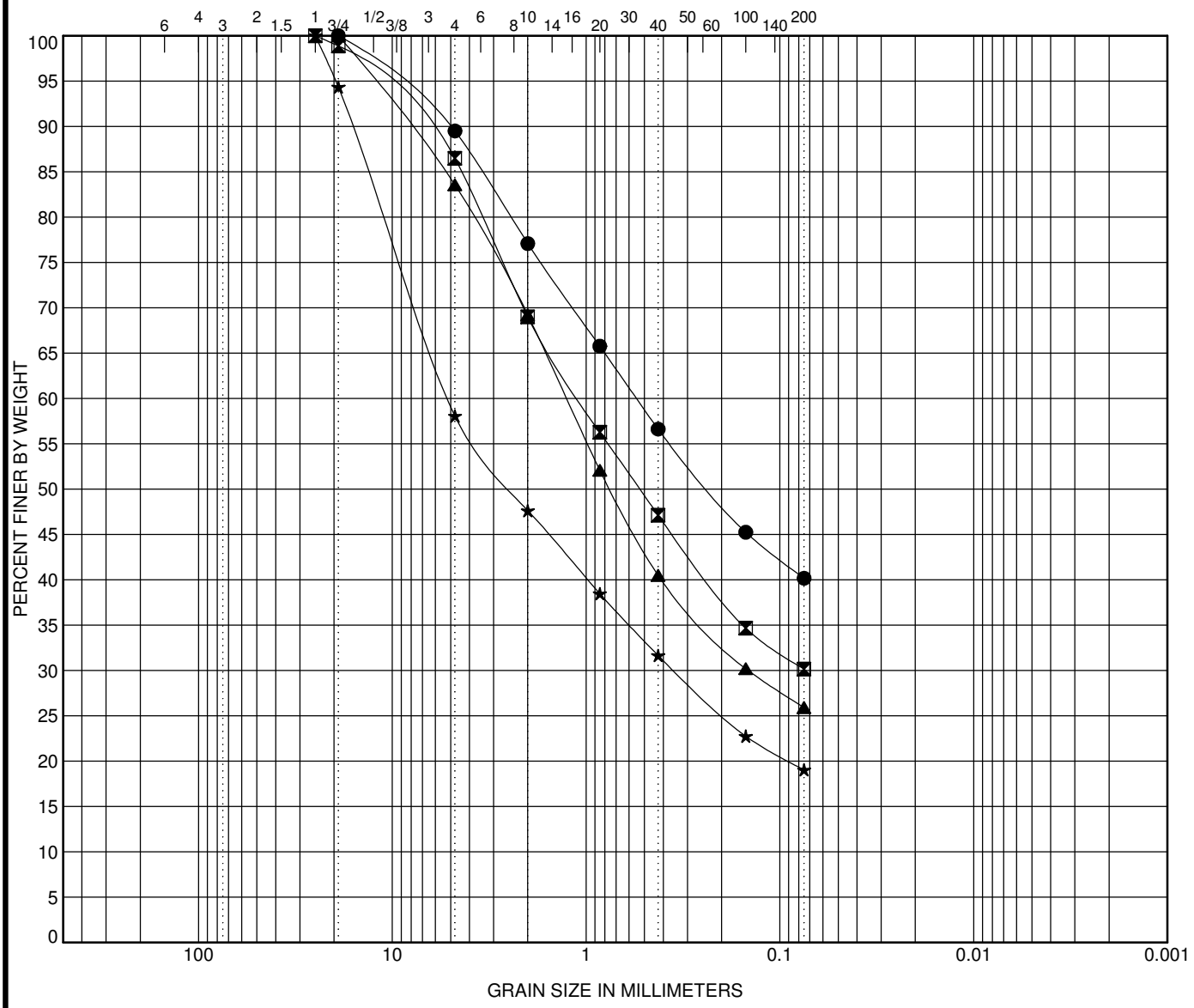
Log of Boring

B-2

Laboratory			Field								
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											Approximate Ground Surface Elevation (feet): 12.8 *
											4-inch **ASPHALTIC CONCRETE**
										GP	Gray **SANDY GRAVEL (BASALTIC)**, moist (fill)
										ML	Reddish brown **SANDY SILT** with some gravel, moist (fill)
Sieve - #200 = 25.9%	8							G		SM	Tan **SILTY SAND (CORALLINE)** with some gravel (coralline), moist (weathered sandstone)
								G			
Sieve - #200 = 19.0%	16	106			29		5			GM	Tan **SILTY GRAVEL (CORALLINE)** with some sand, medium dense, moist (weathered sandstone)
	24				16						
											Boring terminated at 8 feet
							10				
							15				

Date Started:	August 11, 2023	Water Level: ▼	Not Encountered	Plate
Date Completed:	August 11, 2023			
Logged By:	B. Aiu	Drill Rig:	CME-55D *(Energy Transfer Ratio = 77.2%)*	
Total Depth:	8 feet	Drilling Method:	4" Solid-Stem Auger	3.5
Work Order:	8681-00	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 8681-00.GPJ GEOLABS.GDT 9/15/23



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	B-1	1.0-2.0	Tan silty sand (SM) with a little gravel					
⊠	B-1	5.0-6.5	Tan silty sand (SM) with some gravel					
▲	B-2	1.0-2.0	Tan silty sand (SM) with some gravel					
★	B-2	5.0-6.5	Tan silty gravel (GM) with some sand					

	Sample	Depth (ft)	D100 (mm)	D60 (mm)	D30 (mm)	D10 (mm)	%Gravel	%Sand	%Fine
●	B-1	1.0-2.0	19	0.549			10.5	49.3	40.2
⊠	B-1	5.0-6.5	25	1.093			13.5	56.3	30.2
▲	B-2	1.0-2.0	19	1.263	0.146		16.5	57.6	25.9
★	B-2	5.0-6.5	25	5.116	0.35		41.9	39.0	19.0

GEOLABS, INC.
GEOTECHNICAL ENGINEERING

W.O. 8681-00

GRAIN SIZE DISTRIBUTION -

DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

Plate
4.1

G_GRAIN_SIZE_MOD_8681-00.GPJ GEOLABS.GDT 9/15/23

Location	Depth (feet)	pH Value	Minimum Resistivity (ohm-cm)	Chloride Content (mg/kg)	Sulfate Content (mg/kg)
B-1	1.0 - 2.0	8.31*	6400*	ND	15
B-1	5.0 - 6.5	8.91*	5800*	ND	38
B-2	1.0 - 2.0	9.2*	11000*	ND	ND
B-2	5.0 - 6.5	10.03*	5500*	ND	16

TEST METHODS (by Eurofins TestAmerica Laboratories, Inc.)

pH Value	Method 9045C
Minimum Resistivity	SM 2510B
Chloride Content	EPA 300.0
Sulfate Content	EPA 300.0

TEST METHODS (by Geolabs, Inc.)*

pH Value	ASTM G51
Minimum Resistivity	ASTM G57
Chloride Content	N/A
Sulfate Content	N/A

ND: Not Detected Within Reporting Limits

GEOLABS, INC.
GEOTECHNICAL ENGINEERING

W.O. 8681-00

SUMMARY OF CORROSIVITY TESTS

DHHL WEST OAHU SEWER IMPROVEMENTS
WAIANAE, OAHU, HAWAII

Plate
4.2

WN

CONSTRUCTION PLANS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

TAX MAP KEY 8-7-07:4, 8-7-33:14 & 19

PREPARED BY

VTN - pacific

DEVELOPER

KEYSTONE INVESTMENTS, INC.

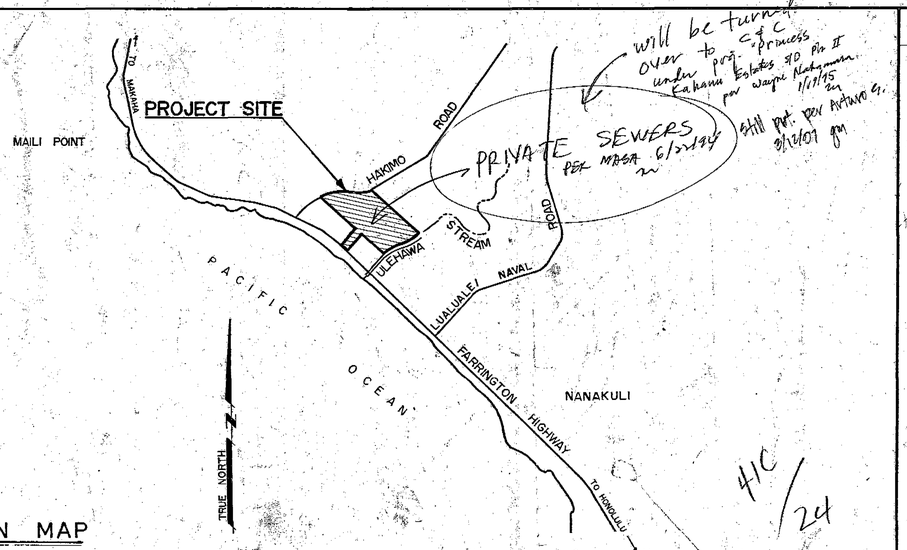
INSPECTOR'S COPY

Wye Book No.
Fld. Engr.
Inspector Antonio Distajo Jr.
Date Final Inspection 7-2-75

CONTRACTOR: M.F. Williams Inc.

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LOCATION MAP

SCALE: 1"=2,000'

APPROVED

Daniel S. Miyasato — 5/21/74
REGISTERED CIVIL ENGINEER, CERTIFICATE NO. 3443-E — DATE

George S. Miyashiro — 5-29-74
DIRECTOR, DEPARTMENT OF LAND UTILIZATION — DATE

Edwards Bista — 5/24/74
MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY. (EXCLUDING SEWAGE TREATMENT FACILITY) — DATE

Yap Hayashida — 5/22/74
DIRECTOR AND CHIEF ENGINEER, DEPARTMENT OF PUBLIC WORKS — DATE

George L. Villegas — 5/24/74
DIRECTOR, DEPARTMENT OF TRANSPORTATION SERVICES — DATE

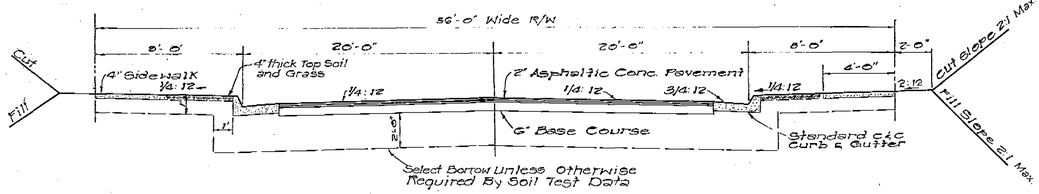
[signature] — 5/17/74
CHIEF, ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION, DEPARTMENT OF HEALTH — DATE

[signature] — 5/21/74
CHIEF, HIGHWAYS DIVISION, DEPARTMENT OF TRANSPORTATION — DATE

WN R28C19, R28C20, R29C20

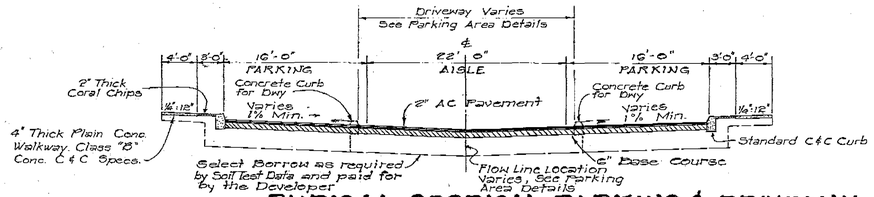
4/C 24

NANAKULI P/D HOUSING.



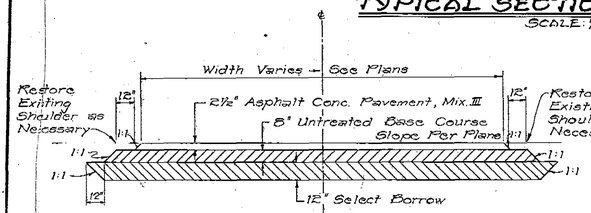
TYPICAL ROADWAY SECTION FOR 56' R/W

Not to Scale



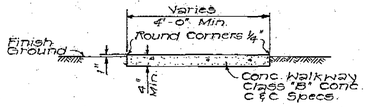
TYPICAL SECTION - PARKING & DRIVEWAY

SCALE: 1/8"=1'-0"



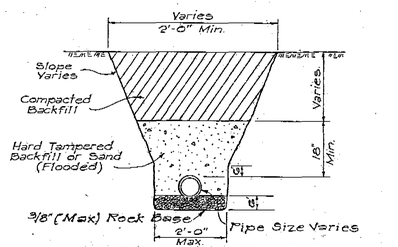
TYPICAL SECTION - ROAD "A", WITHIN STATE HIGHWAY R/W

Scale: 1/4" = 1'-0"



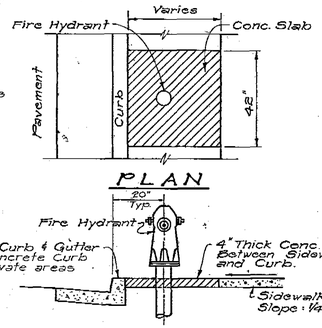
TYPICAL SECTION - CONC. WALKWAY

Scale: 1/2" = 1'-0"



TYPICAL SEWER TRENCH SECTION (PRIVATE SYSTEMS)

Scale 1/2"=1'-0"

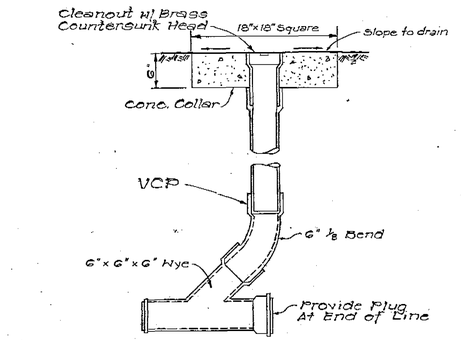


PLAN

SECTION

DETAIL - F.H. CONC. PAD

Scale: 1" = 1'-0"



DETAIL OF CLEANOUT

NOT TO SCALE

STATE HIGHWAY NOTES:

1. The Contractor shall obtain a construction permit from the State Highway District Engineer's Office, 727 Kakoi St. prior to the commencement of work within the State Highway Right-of-Way.
2. Construction and restoration of all existing highway facilities within the State Right-of-Way shall be done in accordance with all applicable sections of the Standard Specifications For Road And Bridge Construction, Dated 1969, and the Specification For Installation of Miscellaneous Improvements Within Federal Aid Highways, Dated April 1, 1974 of the State Highways Division.
3. All lanes shall be opened to traffic during the morning peak hours from 6:00 a.m. to 9:00 a.m. and during the afternoon peak hours from 3:00 p.m. to 6:00 p.m. and during off-work hours. Only one lane of Farrington Highway shall be closed at any time.
4. The Contractor shall provide, install and maintain all necessary signs, lights, flares, barricades, markers, cones and other protective facilities and shall take all necessary precautions for the protection and for the convenience and safety of Public traffic. All such protective facilities and precautions to be taken shall conform with the "Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" adopted by the Highway Safety Coordinator, and the U.S. Federal Highway Administration "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic Controls for Highway Construction and Maintenance Operations", dated 1971.
5. The minimum pavement structure shall consist of 2½ inches asphalt concrete, 8 inches base course and 12 inches select borrow.
6. Pavement striping shall be done by Contractor.

WATER NOTES:

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the Honolulu Board of Water Supply's WATER SYSTEM STANDARDS dated July 1969, and all subsequent amendments and additions.
2. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system such as lines, grade, fittings, etc., shall be the responsibility of the engineer who prepared the plans. Drainage and other features of the improvements shall not be the responsibility of Board of Water Supply.
3. Meter boxes shall be Type "III", for Type "D" and "E" service laterals, type "X" meter boxes shall be installed for type "C" and smaller service laterals, unless otherwise specified. The frames and covers for the meter boxes will be furnished by the B.W.S. at the Board's Kalihi Corporation Yard at no cost to the project. The contractor shall pick up, haul to the job site and install the frames and covers in place complete at his expense.
4. Prior to excavating for new drain, sewer & other utility lines, the contractor shall verify in the field the location of existing water mains and appurtenances. Where the installation of new drain, sewer or other utility lines are to cross over or under existing water mains; the Contractor shall expose the existing water mains prior to trenching. Excavation around water mains shall be done by hand.
5. The contractor shall notify the Board of Water Supply in writing one week prior to commencing work on the main.
6. Water easements in favor of BWS shall be full width of roadway. Easements for water facilities such as meters, fire hydrants, etc, shall be 10 feet wide and 5 feet beyond unless otherwise noted on plans.
7. Laterals from mains to the meters shall be copper tubing of the sizes shown on the plans.
8. In the event that water mains other than cast iron is to be used, the plans shall be resubmitted for approval.
9. Test pressure shall be 150 psi.

PRIVATE WATER SYSTEM NOTES:

1. Individual gate valves (shut off valves) shall be provided for each living unit in the subdivision. (N1C)
2. Laterals to living units from meters shall be PVC. Pipe Schedule 40 (Schedule 80 at Roadway Crossing), or copper tubing, of the size shown on the plans. Installation of the PVC. Pipe shall conform to the manufacture's instructions and specifications. Copper tubing installation shall conform to the Water System Standards, of the Board of Water Supply, City and County of Honolulu.
3. All work shall be done in accordance with the requirements of the Building Department Codes and Regulations of the City and County of Honolulu.
4. Minimum cover for water laterals is 18".
5. Contractor to coordinate water lateral connection points to building water with Mechanical Plans (N1C).

(CITY SEWER)
SEWER NOTES: - See sht. 3

(PRIVATE)
SEWER NOTES: - See sht. 3

CONSTRUCTION NOTES:

1. All construction work shall be done in accordance with the applicable portions of the Standard Specifications, for Public Works, Construction, November 1968, and Standard Details, Feb. 1973, of the Dept. of Public Works, C&C of Honolulu.
2. The project bench mark shall be the BM "a" located on the existing bridge sidewalk at Channel U-2 (See sheet 5. B.M. elev. = 12.00)
3. Bench mark elevations shall be established on all street monument pins and submitted to the Division of Engineering.
4. Street lights shall be installed in accordance with Ordinance No. 1638, as amended by Ordinance Nos. 1770, 2875, 3035 and 3357.
5. Utilities shall be installed pursuant to the provisions of Ordinance Nos. 2875 & 3357. (Underground Utilities)
6. Street Name Signs shall be installed in accordance with the Stds. of the Dept. of Trans. Services. The exact location shall be determined by the Director. In lieu of the Standard embossed signs, reflectorized street name signs and sign brackets identical to that presently used by the Dept. of Trans. Services may be used.
7. The Contractor shall remove all silt and debris resulting from his work and deposited in drainage facilities, roadways and other areas. The costs incurred for any necessary remedial action by the Chief Engineer shall be payable by the Contractor.
8. The Contractor, at his own expense, shall keep the project area and surrounding area free from dust nuisance. The work shall be in conformance with the air pollution control standards and regulations of the State Department of Health.

DANIEL S. MIYASAKI
REGISTERED PROFESSIONAL ENGINEER
NO. 3463
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Daniel S. Miyasaki

REVISION	DATE	DESCRIPTION	APPROVED

VTN - PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

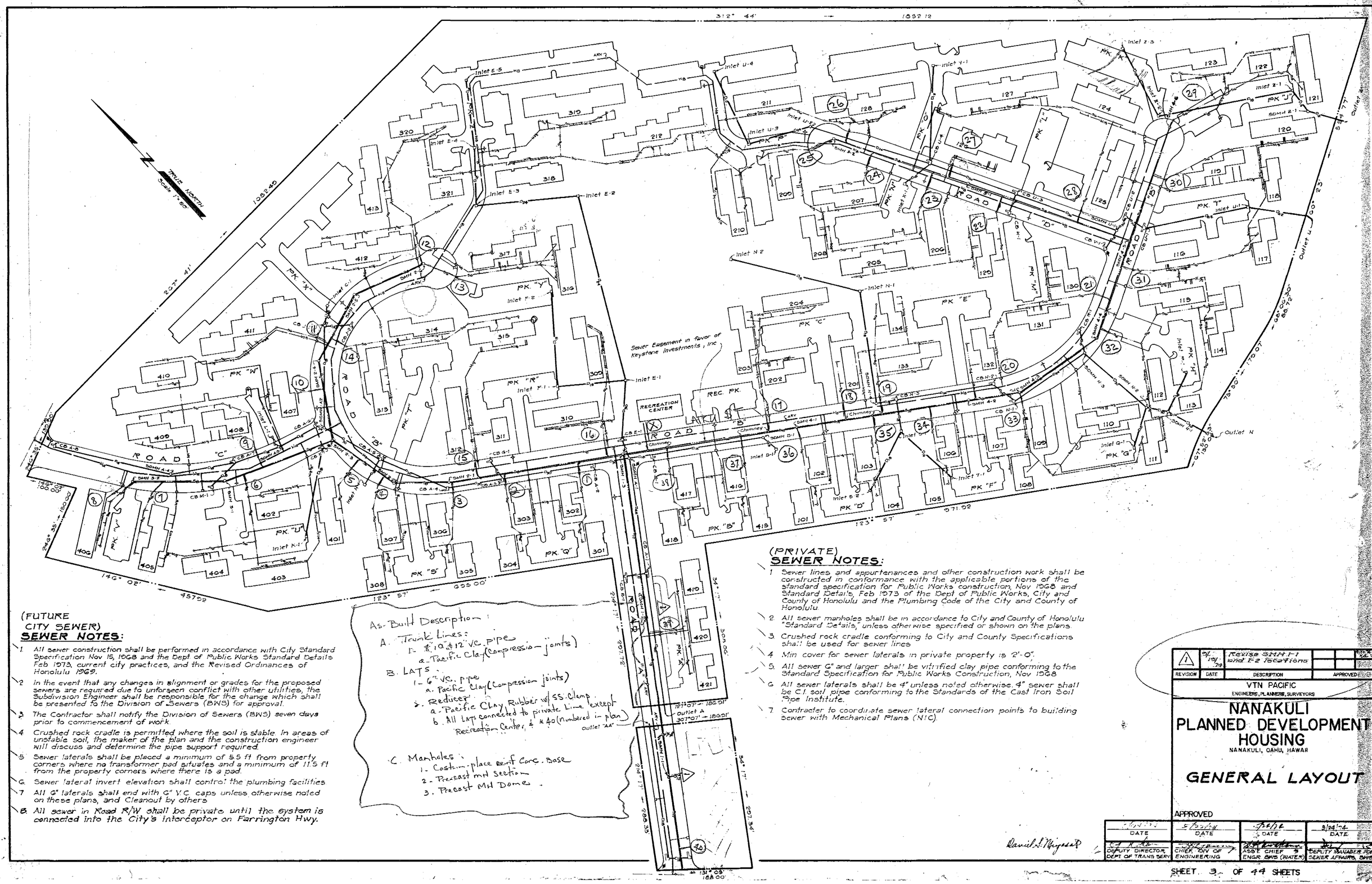
NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

GENERAL NOTES AND MISCELLANEOUS DETAILS

APPROVED:

5/14/74	5/22/74	7/1/74	
DATE	DATE	DATE	
DEPUTY DIRECTOR DEPT. OF TRANS. SERV.	CHIEF DIV. OF ENGINEERING	ASST. CHIEF ENGR. BWS (WATER)	



(FUTURE CITY SEWER)
SEWER NOTES:

1. All sewer construction shall be performed in accordance with City Standard Specification Nov 15, 1968 and the Dept of Public Works Standard Details Feb 1973, current city practices, and the Revised Ordinances of Honolulu 1969.
2. In the event that any changes in alignment or grades for the proposed sewers are required due to unforseen conflict with other utilities, the Subdivision Engineer shall be responsible for the change which shall be presented to the Division of Sewers (BWS) for approval.
3. The Contractor shall notify the Division of Sewers (BWS) seven days prior to commencement of work.
4. Crushed rock cradle is permitted where the soil is stable. In areas of unstable soil, the maker of the plan and the construction engineer will discuss and determine the pipe support required.
5. Sewer laterals shall be placed a minimum of 5.5 ft from property corners where no transformer pad situates and a minimum of 11.5 ft from the property corners where there is a pad.
6. Sewer lateral invert elevation shall control the plumbing facilities.
7. All 6" laterals shall end with 6" V.C. caps unless otherwise noted on these plans, and Cleanout by others.
8. All sewer in Road R/W shall be private until the system is connected into the City's interceptor on Farrington Hwy.

As-Built Description:

A. Trunk Lines:
   1. 8", 10" & 12" VC. pipe
      a. Pacific Clay (Compression joints)

B. LATS:
   1. 6" VC. pipe
      a. Pacific Clay (Compression joints)
   2. Reducer
      a. Pacific Clay Rubber w/ SS. Clamp except
      b. All Laps connected to private Line & Recreation Center, & # 40 (numbered in plan)

C. Manholes:
   1. Cast-in-place Reinf Conc. Base
   2. Precast MH Section
   3. Precast MH Domes

(PRIVATE)
SEWER NOTES:

1. Sewer lines and appurtenances and other construction work shall be constructed in conformance with the applicable portions of the standard specification for Public Works construction, Nov 1968 and Standard Details, Feb 1973 of the Dept of Public Works, City and County of Honolulu and the Plumbing Code of the City and County of Honolulu.
2. All sewer manholes shall be in accordance to City and County of Honolulu "Standard Details," unless otherwise specified or shown on the plans.
3. Crushed rock cradle conforming to City and County Specifications shall be used for sewer lines.
4. Min cover for sewer laterals in private property is 2'-0".
5. All sewer 6" and larger shall be vitrified clay pipe conforming to the Standard Specification for Public Works Construction, Nov 1968.
6. All sewer laterals shall be 4" unless noted otherwise. 4" sewer shall be C.I. soil pipe conforming to the Standards of the Cast Iron Soil Pipe Institute.
7. Contractor to coordinate sewer lateral connection points to building sewer with Mechanical Plans (MC).

REVISION	DATE	DESCRIPTION	APPROVED
1	9/10/74	Revise SMH 1-1 and 1-2 locations	

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING
NANAKULI, OAHU, HAWAII

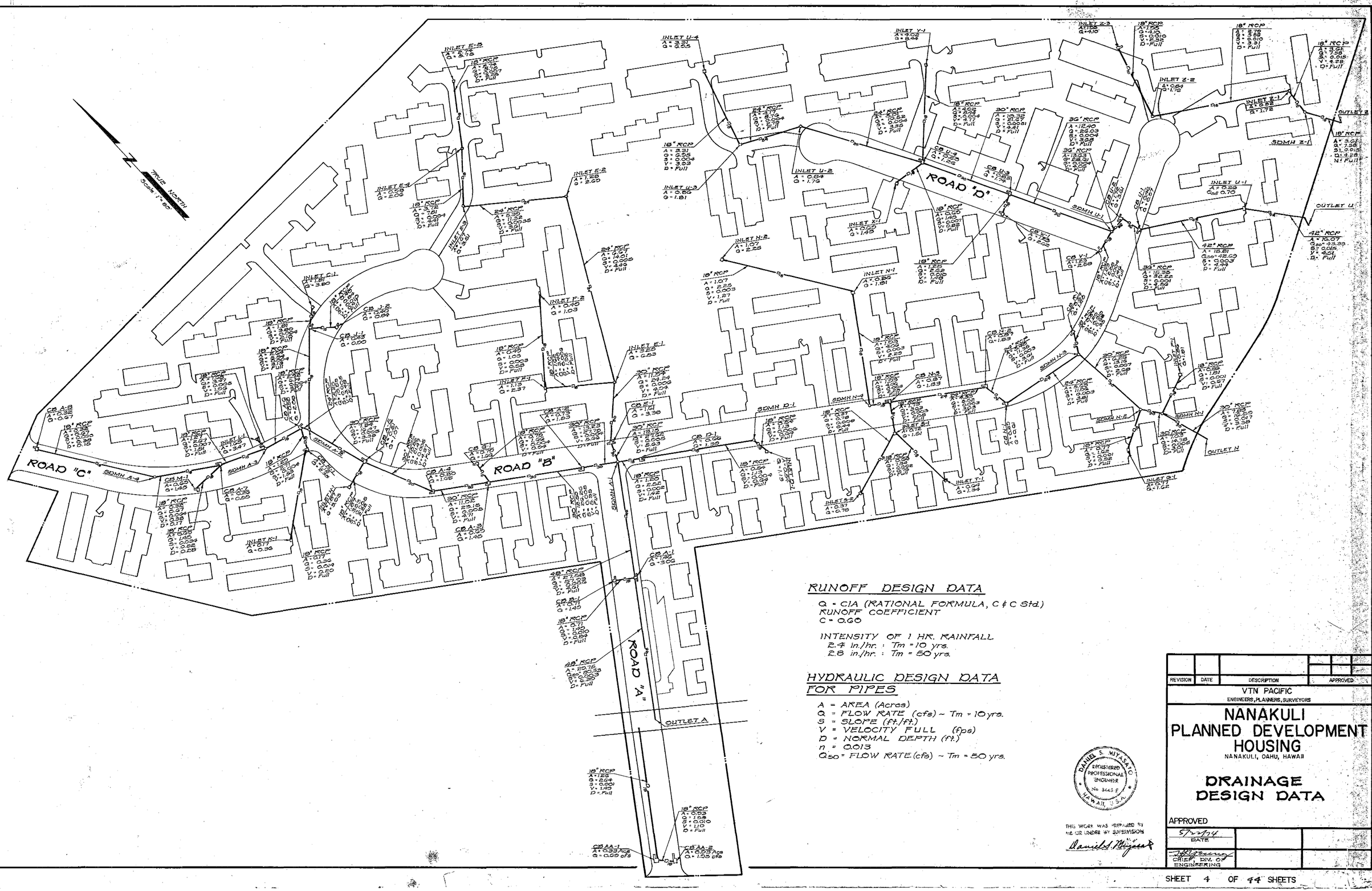
GENERAL LAYOUT

APPROVED

DATE	DATE	DATE	DATE
DEPUTY DIRECTOR, DEPT OF TRANS SERV	CHIEF, DIV OF ENGINEERING	ASST. CHIEF ENGR. BWS (WATER)	DEPUTY MANAGER FOR SEWER AFFAIRS, BWS

Daniel S. Miyasaki

SHEET 3 OF 44 SHEETS



RUNOFF DESIGN DATA

Q = CIA (RATIONAL FORMULA, C & C Std.)
RUNOFF COEFFICIENT
C = 0.60

INTENSITY OF 1 HR. RAINFALL
2.4 in./hr. : Tm = 10 yrs.
2.8 in./hr. : Tm = 50 yrs.

HYDRAULIC DESIGN DATA FOR PIPES

A = AREA (Acres)
Q = FLOW RATE (cfs) ~ Tm = 10 yrs.
S = SLOPE (ft./ft.)
V = VELOCITY FULL (fps)
D = NORMAL DEPTH (ft.)
n = 0.013
Q_{50} = FLOW RATE (cfs) ~ Tm = 50 yrs.

DANIEL S. MIYASATO
REGISTERED PROFESSIONAL ENGINEER
No. 3443-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Daniel S. Miyasato

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

DRAINAGE DESIGN DATA

APPROVED

5/22/74
DATE

CHIEF, DIV. OF ENGINEERING

STATE DEPT. OF TRANSPORTATION
I.D. NO. 0-72-109

155-30

PLAN ~ ROAD "A"

35 L.F. OF ROADWAY SHALL BE CONSTRUCTED UNDER SEPARATE CONTRACT, SEE BRIDGE PLANS. ALL UTILITIES EXCEPT WATER AND ELECTRICAL DUCTS SHALL BE CONSTRUCTED UNDER THIS CONTRACT AND COORDINATED WITH THE BRIDGE PLANS. WATER LINE STA. 2+90 TO 3+35

OUTLET AA
2+96 ± Rd. "A"
Inv. = 9.90
For Detail, See this Sheet

2+60
CONNECT TO EXISTING 8" WATER SEE NOTE BELOW

2+72.20
1-8" ⅛ TV Bend

2+68
Begin Conc. Jacket

2+64
1-¾" Air Relief Valve, WP=150#
1- Air Valve Box

3+35
CONNECT TO EXISTING 8" WATER SEE NOTE BELOW

3+23.5
1-8" ⅛ TV Bend

3+20
End Conc. Jacket
℄ DRIVEWAY
3+67 Rd. "A"

3+85
1-¾" Air Relief Valve, WP=150#
1- Air Valve Box

4+82
1-Type "B" Service Lateral for Irrigation
40' 1 18" RCP Cl. IV @ 0.50%

4+69
1-Type "B" Service Lateral

4+99
1 - F.H.
1 - 6"x8" Tee
1 - 8"G.V. (36"o/a)
1 - Valve Box
1 - Conc. Blk.
12 L.F. 8" C.I. Pipe

7+90
1 - F.H.
1 - 6"x8" Tee
1 - 6" G.V. (150")
1 - Valve Box
1 - Conc. Blk.
12 - L.F. 6" C.I. Pipe

Special SDMH A-1
8+12.68 Rd. "A"
10+89 Rd. "B"
Inv. = 8.60 (18")
Inv. = 8.50 (30")
Inv. = 6.61 (48")
For Detail See Sht. 29

10+11.92 RD. "B"
1 - 8"x8" Tee
3 - 6" G.V. (150#)
3 - Valve Boxes
1 - Conc. Blk.

10+00
1-Type "D" Service Lateral

8+29.68 RD. A =
10+21.92 RD. B
Install C℄C St. Mon.

CB E-1
10+30 Rd. "B"
Inv. = 8.00

10+82
1-Type "B" Service Lateral
1-Service Clamp

CB AA-1 Type "B"
0+90 Rd. "A"
Inv. = 9.87

1+44
1-Type "B" Service Lateral for Irrigation

INSTALL:
1- Type R-1 "Stop Sign"
1- Street Name Sign
Paint Cross Walk
Paint "Stop" bar and ℄ Striping as shown

Install Temp. Plug

0+00
Install C℄C Mon.

Connect to Existing 8" Water Line

0+24 ⅝°
0+60
Type "B" 1-8" Vee Bend
1- Conc. Blk.
For Irrigation

OUTLET "A"
3+06 ± Rd. "A"
Inv. = 3.12

CB AA-2 Type "A" Inv. = 3.12
0+22 Rd. "A"
Inv. = 8.29
For Detail, See This Sht.

Bench Mark "A" on East Bridge Sidewalk
Elev. = 12.89

Temp. For Testing

1- 8" Temp. C.O. w/ M.J. Cap

Construct A.C. Curb & A.C. Sidewalk to match Existing

Existing Chain link fence to match into Bridge railing

TRUE NORTH
Scale: 1" = 40'

Existing 8" C.I. Water Line

Existing Pipe

Existing Ground

Road Grade

18" RCP

Exist. Channel Inv.

48" RCP

Future Bridge Abutment

TEMP. OUTLET TO CHANNEL
No Scale

Existing Chain Link Fence to Remain

Existing Cone. Bridge to remain See Bridge Plans.

Existing 18' Wide Drainage Channel

Remove & Salvage
1- Temp. C.O. w/ M.J. Cap

NOTE FOR WATER CONN.
2+60 & 3+35 Road "A"
CONNECTION SHALL BE COMPLETED AFTER THE BRIDGE PLAN WATER LINE HAS BEEN COMPLETED

Install
1 - 8" Sleeve, 15" Long
1 - 8" Temp. C.O. w/ M.J. Cap
8 L.F. 8" C.I. Pipe

Sewer Easement in favor of Keystone Investments Inc.

CB B-1 Type "B"
3+90 Rd. "A"
Inv. = 8.00

CB A-1 Type "B"
3+90 Rd. "A"
Inv. = 7.60 (18")
Inv. = 5.86 (48")

SMH 1-2 ⅝% 5.00'
3+44.00 Rd. "A"
Rd. = 89.00
Inv. = 6.28 (12")
Inv. = 6.28 (12")

SMH 1-1 ⅝% 5.00'
0+39 Rd. "A"
Rd. = 89.00
Inv. = 6.33 (12")
Inv. = 6.33 (12")

Shallow Drop SMH 1-3 ⅝% 5.00'
8+24.71 Rd. "A"
10+26.89 Rd. "B"
8+29.71 SL-1
0+00 SL-2
0+02 SL-3
Inv. = 4.90 (8")
Inv. = 4.70 (10")
Inv. = 0.74 (12")

6" LAT.
4+70 Rd. "A"
@ 0.20
Inv. = 9.58

6" LAT. W/ Reducer
0+15 Rd. "A"
Inv. = 8.22

Y. Sta.	4+70
T. L.	23
Lot Sta.	4+71
C =	9" RISE
Lot No.	53

Road "B"
See Sht. 6

Construct Smooth Riding Transition

Existing Pavt.

Replace & Replace 1'-0" Min. of Existing Pavement

Slope

Existing A.C. Curb & Sidewalk

SECTION AA
No Scale

LEFT CURB RETURN
Δ = 90°20'
½ = 45° 10'
K = 28.00
T = 28.16
C = 35.71
L = 44.15

½ = 22° 35'
Ch = 10.96

RIGHT CURB RETURN
Δ = 89° 10'
½ = 44° 50'
K = 28.00
T = 27.84
C = 39.48
L = 43.82

½ = 22° 25'
Ch = 10.89

LEFT CURB RETURN
Δ = 88° 08'
½ = 44° 04'
R = 28.00
T = 31.54
C = 41.88
L = 43.31

RIGHT CURB RETURN
Δ = 53° 12'
½ = 26° 36'
R = 28.00
T = 19.26
C = 27.18
L = 29.02

PLAN
For Plan, See Sht. 18; For Profile, See Sht. 26

NOTE:
All Driveways shall be Standard Drop Driveway. For Driveway Widths, see Parking Area Detail plans.

PROFILE ~ ROAD "A"
Scales: Horiz. 1" = 40'
Vert. 1" = 4'

Existing Ground @ ℄ Road

Top of Curb Grade +1.1%

+0.6%

-0.4%

Construct Smooth Riding Connection See Plan

Approximate location of existing conduit to be verified in the field by the contractor

HGL

Curb Grade
0+49 0.85
INT. BCR 9.58
INT. BCR 9.64

Exist. Survey Mon. (brass pin set in conc.)

Rock Cradle

HARD CORAL

CORAL

Existing Ground @ ℄ Road

| | | |

175-2

PLAN ~ ROAD "B"

PROFILE ~ ROAD "B"

Scales: Horiz 1" = 40'
Vert 1" = 4'

MATCH LINE 7+00 — SEE SHT. 7

MATCH LINE 12+00 — SEE SHT. 7

TRUE NORTH Scale: 1"=40'

℄ CURVE DATA

Δ = 174° 29' 00"
½Δ = 87° 14' 30"
R = 203.00
T = 4218.43
C = 405.53
L = 618.20

0+15 DNV. Sta.
1-FH
1-8"x6" Tee
1-6" Galv.(150#)
1-Valve Box
2-Conc. Blk.
33 LF 6" CI. Pipe

(-) 0+24.47
Install C & C St. Mon.

WATERLINE
For Main, See Sht. 8
For Profile, See Sht. 28

1-Type "E" Service Lat.
1-8" Double Hub Fitting For Irrigation

0+00 EQ. STA.

0+00
1-¾" Air Relief Valve NP 150#
1-Air Valve Box

P.C. 0+44.63
Install C & C St. Mon.

P.T. 6+62.79
Install C & C St. Mon.

0+10 ⅝%-10'
1-8" ½ Bend
1-Conc. Blk.

0+17.67

0+11
1-Type "D" Service Lateral

0+71 ⅝%-4'
1-8" ½ Bend
1-Conc. Blk.

CURB RETURN
Δ = 243° 34' 36"
½Δ = 121° 47' 18"
R = 32.00
L = 136.04
℄ to CR = 21' 27.6"
CH = 13.50

1+08
1-Type "S" Service Lat.
1-8" Double Hub Fitting

1+46 ⅝%-3'
1-8" ½ Bend
1-Conc. Blk.

SMH #2-5 ⅝%-15.00'
1-1.50 Rd. "B"
0-Inlet
Inv. = 10.52

INLET C-1 1%-30'
1+86.91
Inv. = 12.89
Type "S-3"

BOTH CURB RET.
Δ = 31° 47' 18"
½Δ = 15° 53' 39"
R = 48.00
T = 13.67
C = 26.23
L = 26.63
½Δ = 15° 53' 39"
CH = 13.27

2+00
1-Type "D" Service Lat. For Irrigation

℄ DRIVEWAY
1+86.01 Rd. "B"
Az. = 198° 30'

CB-J1 Type "A"
2+12 Rd. "B"
Inv. = 12.74

5+80
1-FH.
1-8"x6" Tee
1-6" G.V.(150#)
1-Valve Box
2-Conc. Blks.
29 LF 6" C.I. Pipe

℄ DRIVEWAY
5+65.55 Rd. "B"
Az. = 249° 16'

5+90
1-Type "D" Service Lat. For Irrigation

5+32 ⅝-1'
1-8" ½ Bend
1-Conc. Blk.

4+06
1-8"x8" Tee
1-12"x8" G.V.(150#)
3-Valve Boxes
1-Conc. Blk.
1-12"x8" Reducer C28
1-12" Nipple 24" Long

3+88 ⅝-3'
1-8" ½ Bend
1-Conc. Blk.

3+60
1-FH.
1-8"x6" Tee
1-6" G.V.(150#)
1-Valve Box
2-Conc. Blks.
31 LF 6" C.I. Pipe

4+75 ⅝-1'
1-8" ½ Bend
1-Conc. Blk.

1+59
1-FH.
1-8"x6" Tee
1-6" G.V.(150#)
1-Valve Box
2-Conc. Blks.
28 LF 6" C.I. Pipe

1+35
1-Type "D" Service Lat.

CB-J2 Type "A"
1+90 Rd. "B"
Inv. = 13.27

2+19 ⅝-5'
1-8" ½ Bend
1-Conc. Blk.

3+13 ⅝-5'
1-8" ½ Bend
1-Conc. Blk.

SMH #2-3 ⅝-14.99
1-1.50 Rd. "B"
0-Inlet
Inv. = 10.52

MATCH LINE 7+00

SMH #2-4 ⅝-14.99
2+80 Rd. "B"
0+22.99 SE-2
Inv. = 8.75

SMH #2-2 ⅝-15.00'
6+78.82 Rd. "B"
3+50.02 SE-2
Inv. = 6.35

CB-A4 Type "B"
6+70 Rd. "B"
Inv. = 9.57

Sewer Easement in favor of Keystone Investments, Inc.

℄ DRIVEWAY
6+02.92 Rd. "B"
Az. = 51° 00'

5+77
1-Type "D" Service Lat.

5+70 Rd. "B"
4+61.00 SL-2
Inv. = 7.97

DL-H
For Profile See Sht. 26

5+36.86
Install C & C St. Mon.

CB-A5 Type "B"
5+25 Rd. "B"
Inv. = 11.39 (18")
Inv. = 10.30 (30")

INLET-H1 ⅝-40.0'
5+25 Rd. "B"
Inv. = 11.89
Type "Y-2"

0+49.37

4+80.06

CB-K1 Type "A"
0+48 Rd. "C"
Inv. = 12.15

ROAD "C" See Sht. 8

4+11 Rd. "B"
0+00 Rd. "C"
Install C & C St. Mon.

SHALLOW SDMH-A2
4+01 Rd. "B"
0+21 Rd. "C"
Inv. = 11.99 (18")
Inv. = 11.44 (24")
Inv. = 10.59 (30")

DL-K
For Main, See Sht. 8 & 13
For Profile, See Sht. 26

2+27.76
Install C & C St. Mon.

2+35
1-Type "A" Service Lat.
1-8" Double Hub Fitting

CB-A6 Type "B"
0+35 Rd. "C"
Inv. = 12.02 (18")
Inv. = 11.52 (24")

0+00 EQ. STA.

Curb Grade

31'±18" RCP Cl. IV @ 0.004

53'± 18" RCP Cl. IV @ 0.004

200'± 18" RCP Cl. III @ 0.004

159'± 30" RCP Cl. III @ 0.005

49'± 30" RCP Cl. III @ 0.005

188'± 36" RCP Cl. III @ 0.005

350.00'± 42" RCP @ 0.0025

43'± 18" RCP Cl. IV @ 0.004

INLET C-1
Inv. = 12.89

CB-J1
Inv. = 12.74

CB-J2
Inv. = 13.27

CB-A6
Inv. = 12.02

CB-A5
Inv. = 11.39

CB-A4
Inv. = 9.57

CB-K1
Inv. = 12.15

CB-A3
Inv. = 10.51

CB-A2
Inv. = 8.08

CB-G1
Inv. = 7.68

CB-A1
Inv. = 7.80

CB-D1
Inv. = 8.89

CB-E1
Inv. = 8.00

SMH #2-5
Inv. = 10.52

SMH #2-4
Inv. = 8.75

SMH #2-3
Inv. = 10.02

SMH #2-2
Inv. = 6.35

SMH #2-1
Inv. = 7.06

SMH #2-6
Inv. = 11.5

SMH #2-7
Inv. = 10.64

SMH #2-8
Inv. = 10.27

SMH #2-9
Inv. = 10.56

SDMH-A2
Inv. = 10.59

SDMH-A1
Inv. = 7.80

SDMH-B1
Inv. = 7.23

SDMH-B2
Inv. = 7.14

SDMH-B3
Inv. = 7.06

SDMH-B4
Inv. = 6.98

SDMH-B5
Inv. = 6.90

SDMH-B6
Inv. = 6.82

SDMH-B7
Inv. = 6.74

SDMH-B8
Inv. = 6.66

SDMH-B9
Inv. = 6.58

SDMH-B10
Inv. = 6.50

SDMH-B11
Inv. = 6.42

SDMH-B12
Inv. = 6.34

SDMH-B13
Inv. = 6.26

SDMH-B14
Inv. = 6.18

SDMH-B15
Inv. = 6.10

SDMH-B16
Inv. = 6.02

SDMH-B17
Inv. = 5.94

SDMH-B18
Inv. = 5.86

SDMH-B19
Inv. = 5.78

SDMH-B20
Inv. = 5.70

SDMH-B21
Inv. = 5.62

SDMH-B22
Inv. = 5.54

SDMH-B23
Inv. = 5.46

SDMH-B24
Inv. = 5.38

SDMH-B25
Inv. = 5.30

SDMH-B26
Inv. = 5.22

SDMH-B27
Inv. = 5.14

SDMH-B28
Inv. = 5.06

SDMH-B29
Inv. = 4.98

SDMH-B30
Inv. = 4.90

SDMH-B31
Inv. = 4.82

SDMH-B32
Inv. = 4.74

SDMH-B33
Inv. = 4.66

SDMH-B34
Inv. = 4.58

SDMH-B35
Inv. = 4.50

SDMH-B36
Inv. = 4.42

SDMH-B37
Inv. = 4.34

SDMH-B38
Inv. = 4.26

SDMH-B39
Inv. = 4.18

SDMH-B40
Inv. = 4.10

SDMH-B41
Inv. = 4.02

SDMH-B42
Inv. = 3.94

SDMH-B43
Inv. = 3.86

SDMH-B44
Inv. = 3.78

SDMH-B45
Inv. = 3.70

SDMH-B46
Inv. = 3.62

SDMH-B47
Inv. = 3.54

SDMH-B48
Inv. = 3.46

SDMH-B49
Inv. = 3.38

SDMH-B50
Inv. = 3.30

SDMH-B51
Inv. = 3.22

SDMH-B52
Inv. = 3.14

SDMH-B53
Inv. = 3.06

SDMH-B54
Inv. = 2.98

SDMH-B55
Inv. = 2.90

SDMH-B56
Inv. = 2.82

SDMH-B57
Inv. = 2.74

SDMH-B58
Inv. = 2.66

SDMH-B59
Inv. = 2.58

SDMH-B60
Inv. = 2.50

SDMH-B61
Inv. = 2.42

SDMH-B62
Inv. = 2.34

SDMH-B63
Inv. = 2.26

SDMH-B64
Inv. = 2.18

SDMH-B65
Inv. = 2.10

SDMH-B66
Inv. = 2.02

SDMH-B67
Inv. = 1.94

SDMH-B68
Inv. = 1.86

SDMH-B69
Inv. = 1.78

SDMH-B70
Inv. = 1.70

SDMH-B71
Inv. = 1.62

SDMH-B72
Inv. = 1.54

SDMH-B73
Inv. = 1.46

SDMH-B74
Inv. = 1.38

SDMH-B75
Inv. = 1.30

SDMH-B76
Inv. = 1.22

SDMH-B77
Inv. = 1.14

SDMH-B78
Inv. = 1.06

SDMH-B79
Inv. = 0.98

SDMH-B80
Inv. = 0.90

SDMH-B81
Inv. = 0.82

SDMH-B82
Inv. = 0.74

SDMH-B83
Inv. = 0.66

SDMH-B84
Inv. = 0.58

SDMH-B85
Inv. = 0.50

SDMH-B86
Inv. = 0.42

SDMH-B87
Inv. = 0.34

SDMH-B88
Inv. = 0.26

SDMH-B89
Inv. = 0.18

SDMH-B90
Inv. = 0.10

SDMH-B91
Inv. = 0.02

SDMH-B92
Inv. = -0.06

SDMH-B93
Inv. = -0.14

SDMH-B94
Inv. = -0.22

SDMH-B95
Inv. = -0.30

SDMH-B96
Inv. = -0.38

SDMH-B97
Inv. = -0.46

SDMH-B98
Inv. = -0.54

SDMH-B99
Inv. = -0.62

SDMH-B100
Inv. = -0.70

SDMH-B101
Inv. = -0.78

PLAN ~ ROAD "B"

PROFILE ~ ROAD "B"

155-31

TRUE NORTH
Scale 1"=40

℄ CURVE DATA

Δ = 61° 34' 46"
½Δ = 30° 47' 23"
R = 280.00
T = 166.85
C = 289.66
L = 300.33

BOTH CURB RETURNS

Δ = 31° 47' 18"
½Δ = 15° 53' 39"
R = 48.00
T = 13.67
C = 26.29
L = 26.63 ✓

½Δ = 15° 53' 39"
Ch = 13.27

CURB RETURN

Δ = 243° 34' 36"
½Δ = 121° 47' 18"
R = 32.00
L = 136.04

Δa = 24° 21' 27.0"
Ch = 13.50

MATCH LINE 12+00 — SEE SHT 6
MATCH LINE 21+00 — SEE SHT 8

℄ DRIVEWAY
12+38 Rd "B"

12+15
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
12 L.F. G"C.I. Pipe

CHIMNEY
12+04
Inv ℄ 8"xG
Wye = 5.70

CHIMNEY
13+20
Inv ℄ 8"xG
Wye = 2.00

13+25
1-Type "E" Service Lateral
1-8" Double Hub Fitting

13+60
1-¾" Air Relief Valve, MWP=150
1-Air Valve Box

14+31
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

15+18
1-Type "E" Service Lateral
1-8" Double Hub Fitting

SDMH N-4 ⅝=17'
15+44 Rd. "B"
Inv. = 10.30

DL-"N"
For Plan, See Sht 17
For Profile, See Sht 26

CB N-2 Type "B"
17+80 Rd. "B"
Inv. = 8.00

CB N-3 Type "B"
15+85 Rd. "B"
Inv. = 10.18 (18")
Inv. = 8.68 (24" ℄ 18")

16+10
1-8"G.V.(150#)
1-Valve Box

℄ DRIVEWAY
17+19 Rd. "B"

17+05
1-Type "E" Service Lateral
1-8" Double Hub Fitting

18+22
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
12 L.F. G"C.I. Pipe

20+68
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

0+48
Install St. Name Sign

22+15
1-8"⅛ T.V. Bend
1-Conc. Blk.

22+55
1-8"⅛ Bd Bend
1-Conc. Blk.

22+64
1-Type "D" Service Lat. For Irrig.

22+68
1-8"⅛ Bd Bend
1-Conc. Blk.

22+74
1-8"⅛ T.V. Bend
1-Conc. Blk.

22+27
1-8"⅛ Bd Bend
1-Conc. Blk.

23+19
1-Type "D" Service Lat.

24+10
1-Type "D" Service Lat.

24+12
1-8"⅛ Bend
1-Conc. Blk.

24+17.83 Rd. "B"
Install C℄C St. Mon.

ROAD "D"
See Sht 3

CB V-1 Type "A"
0+30 Rd. "D"
Inv. = 8.57

SHALLOW SDMH U-1
22+18 Rd. "B"
0+20 Rd. "D"
Inv. = 8.79 (18")
Inv. = 7.70 (36")

CB U-2 Type "E"
22+49.83 Rd "B"
Inv = 7.66
See Sht 29

CB R-1 Type "A"
20+98 Rd. "B"
Inv. 10.38

PC. 17+81.70
Install C℄C Mon.

PT. 23+32.39
Install C℄C Mon.

MATCH LINE 21+00

℄ DRIVEWAY
20+47.05 Rd. "B"
Az = 333° 39' 44"

20+68
1-Type "E" Service Lat.
1-8" Double Hub Fitting

19+83
1-Type "E" Service Lat.
For Irrigation

19+44
1-Type "E" Service Lat.
1-8" Double Hub Fitting

SMH 4-4 ⅝=14.80
20+10.00 Rd "B"
0+68.76 SL-4
Inv = 6.62 (8")

SHALLOW SDMH N-3 ⅝=14'
19+74 Rd. "B"
Inv. = 9.21 (18")
Inv. = 7.91 (30")
Inv. = 6.21 (36")

CB N-1 Type "A"
18+12 Rd. "B"
Inv. = 7.03

SMH 4-3 ⅝=8.70
18+27 Road "B"
8+01.82 SL-4
Inv = 3.97 (8")
Inv = 3.80 (8")
Inv = 3.63 (10")

18+27 Rd "B"
Inv = 5.76

18+91.02 Rd. "B"
Az = 11° 35' 54"

℄ DRIVEWAY
18+91.02 Rd. "B"
Az = 11° 35' 54"

CB U-1 Type "E"
22+35 Rd. "B"
Inv. = 7.62 (36")
Inv. = 6.62 (42")
See Sht. 29

SMH 4-5 ⅝=8.00
22+06.83 Rd "B"
0+00.00 Rd "D"
0+68.00 SL-4
0+00 SL-5
Inv = 5.60

22+01.83 Rd "B"
0+00 Rd "D"
Install C℄C St. Mon.

℄ DRIVEWAY
22+65 Rd "B"

21+84
1-Type "E" Service Lateral
1-8" Double Hub Fitting

21+01.83

DL "J"
For Plan, See Sht 17
For Profile, See Sht 26

22+88
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

23+28
1-Type "E" Service Lateral
1-8" Double Hub Fitting

SMH 4-6 ⅝=6.00
22+43 Rd "B"
14+26.77 SL-4
Inv = 4.71 (6")
Inv = 4.24 (18")

G"LAT.
5'-0"
Inv = 4.80

Corner Cut-De-Sac
14.22

INLET D-1 ⅝=42'
13+50 Rd. "B"
Inv. = 9.09
Type "Y-2"

Sewer Easement in favor of Keystone Investment, Inc.

SDMH D-1 (⅝=17')
13+08 Rd. "B"
Inv. = 9.79

12+10
1-Type "D" Service Lat.

G"LAT.
13.20 Rd "B"
5'-0"
Inv = 10.33

G"LAT.
13+70 Rd "B"
5'-0"
Inv = 12.00

Deep Drop SMH 4-5 ⅝=8.00
13+75.00 Rd. "B"
8+48.11 SL-4
Inv = 11.75 (6")
Inv = 2.00 (10")

14+26
1-Type "D" Service Lateral

℄ DRIVEWAY
14+54 Rd. "B"

G"LAT.
15+52 Rd "B"
5'-0"
Inv = 7.53

CHIMNEY
15+52
Inv ℄ 8"xG
Wye = 6.20

G"LAT.
15+92 Rd "B"
5'-0"
Inv = 5.17

G"LAT.
153.28 Rd "B"
5'-0"
Inv = 7.01

CHIMNEY
15+58
Inv ℄ 8"xG
Wye = 5.78

CHIMNEY
15+78
Inv ℄ 8"xG
Wye = 8.80

DL-"F"
For Plan, See Sht 17
For Profile, See Sht 26

INLET S-1 ⅝=4.5
15+86 Rd. "B"
Inv. = 8.87
Type "Y-2"

G"LAT.
16+44 Rd "B"
5'-0"
Inv = 6.39

16+10
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

16+56
1-Type "D" Service Lat.

SMH 4-2 ⅝=8.00
17+25.80 Rd "B"
6+08.11 SL-4
Inv = 3.28

G"LAT.
17+42 Rd "B"
5'-0"
Inv = 5.17

SDMH N-4 ⅝=17'
15+44 Rd. "B"
Inv. = 10.30

DL-"N"
For Plan, See Sht 17
For Profile, See Sht 26

CB N-2 Type "B"
17+80 Rd. "B"
Inv. = 8.00

CB N-3 Type "B"
15+85 Rd. "B"
Inv. = 8.68 (24" ℄ 18")

16+10
1-8"G.V.(150#)
1-Valve Box

℄ DRIVEWAY
17+19 Rd. "B"

17+05
1-Type "E" Service Lateral
1-8" Double Hub Fitting

18+22
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
12 L.F. G"C.I. Pipe

20+68
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

0+48
Install St. Name Sign

22+15
1-8"⅛ T.V. Bend
1-Conc. Blk.

22+55
1-8"⅛ Bd Bend
1-Conc. Blk.

22+64
1-Type "D" Service Lat. For Irrig.

22+68
1-8"⅛ Bd Bend
1-Conc. Blk.

22+74
1-8"⅛ T.V. Bend
1-Conc. Blk.

22+27
1-8"⅛ Bd Bend
1-Conc. Blk.

23+19
1-Type "D" Service Lat.

24+10
1-Type "D" Service Lat.

24+12
1-8"⅛ Bend
1-Conc. Blk.

24+17.83 Rd. "B"
Install C℄C St. Mon.

ROAD "D"
See Sht 3

CB V-1 Type "A"
0+30 Rd. "D"
Inv. = 8.57

SHALLOW SDMH U-1
22+18 Rd. "B"
0+20 Rd. "D"
Inv. = 8.79 (18")
Inv. = 7.70 (36")

CB U-2 Type "E"
22+49.83 Rd "B"
Inv = 7.66
See Sht 29

CB R-1 Type "A"
20+98 Rd. "B"
Inv. 10.38

PC. 17+81.70
Install C℄C Mon.

PT. 23+32.39
Install C℄C Mon.

MATCH LINE 21+00

℄ DRIVEWAY
20+47.05 Rd. "B"
Az = 333° 39' 44"

20+68
1-Type "E" Service Lat.
1-8" Double Hub Fitting

19+83
1-Type "E" Service Lat.
For Irrigation

19+44
1-Type "E" Service Lat.
1-8" Double Hub Fitting

SMH 4-4 ⅝=14.80
20+10.00 Rd "B"
0+68.76 SL-4
Inv = 6.62 (8")

SHALLOW SDMH N-3 ⅝=14'
19+74 Rd. "B"
Inv. = 9.21 (18")
Inv. = 7.91 (30")
Inv. = 6.21 (36")

CB N-1 Type "A"
18+12 Rd. "B"
Inv. = 7.03

SMH 4-3 ⅝=8.70
18+27 Road "B"
8+01.82 SL-4
Inv = 3.97 (8")
Inv = 3.80 (8")
Inv = 3.63 (10")

18+27 Rd "B"
Inv = 5.76

18+91.02 Rd. "B"
Az = 11° 35' 54"

℄ DRIVEWAY
18+91.02 Rd. "B"
Az = 11° 35' 54"

CB U-1 Type "E"
22+35 Rd. "B"
Inv. = 7.62 (36")
Inv. = 6.62 (42")
See Sht. 29

SMH 4-5 ⅝=8.00
22+06.83 Rd "B"
0+00.00 Rd "D"
0+68.00 SL-4
0+00 SL-5
Inv = 5.60

22+01.83 Rd "B"
0+00 Rd "D"
Install C℄C St. Mon.

℄ DRIVEWAY
22+65 Rd "B"

21+84
1-Type "E" Service Lateral
1-8" Double Hub Fitting

21+01.83

DL "J"
For Plan, See Sht 17
For Profile, See Sht 26

22+88
1-F.H.
1-8xG Tee
1-G"G.V.(150#)
1-Valve Box
2-Conc. Block
32 L.F. G"C.I. Pipe

23+28
1-Type "E" Service Lateral
1-8" Double Hub Fitting

SMH 4-6 ⅝=6.00
22+43 Rd "B"
14+26.77 SL-4
Inv = 4.71 (6")
Inv = 4.24 (18")

G"LAT.
5'-0"
Inv = 4.80

Corner Cut-De-Sac
14.22

INLET D-1
Inv. = 9.79

SDMH D-1
Inv. = 9.79

CHIMNEY
12+04
Inv ℄ 8"xG
Wye = 5.70

CHIMNEY
13+20
Inv ℄ 8"xG
Wye = 2.00

CHIMNEY
14+79
Inv ℄ 8"xG
Wye = 8.80

CHIMNEY
15+58
Inv ℄ 8"xG
Wye = 6.20

CHIMNEY
15+78
Inv ℄ 8"xG
Wye = 5.78

SDMH N-4
Inv. = 10.30

SDMH N-3
Inv. = 10.18

SDMH N-2
Inv. = 8.00

SDMH 4-2
Inv. = 3.28

SDMH 4-3
Inv. = 3.97
3.80
3.63

SDMH 4-4
Inv. = 6.62

SDMH 4-5
Inv. = 5.60

SDMH 4-6
Inv. = 4.71
4.24

CB-N1
Inv. = 7.03

CB-N2
Inv. = 8.00

CB-N3
Inv. = 10.38

CB-U1
Inv. = 7.62 (36")
Inv. = 6.62 (42")

CB-U2
Inv. = 7.66

EXISTING GROUND @ ± ROAD

CORAL

ROCK CRADDLE

24" RCP Cl. III @ 0.003

24" RCP Cl. III @ 0.0044

24" RCP Cl. III @ 0.0049

24" RCP Cl. III @ 0.0057

24" RCP Cl. III @ 0.0067

10" VCP @ 0.0034

10" VCP @ 0.0052

10" VCP @ 0.0049

10" VCP @ 0.0057

10" VCP @ 0.0067

10" VCP @ 0.0044

10" VCP @ 0.0084

10" VCP @ 0.0001

10" VCP @ 0.0001

10" VCP @ 0.0001

175-3

PLAN ~ ROAD "C"

TRUE NORTH
Scale 1"=40'

CB K-1 Type "A" 0+48 Rd "C" Inv = 12.19

SMH 2-S 5'ø=20.0E (Rd "B") Cu 19.6K Rd "C" El 25.0 Rd "B" El 21.0 SE 25.3 SW 25.3 Inv = 17.06

1+17 1-8"x8" Tee, 1-8" G.V., 1-Valve Box, 1-Conc. Blk.

0+80 1-Type "S" Service Lateral

2+17 1-F.H. 1-12"x6" Tee, 1-6" G.V. (150') 1-Valve Box, 2-Conc. Blk., 27 L.F. 6" C.I. Pipe

2+80.71 Install C.I.C. St. Mon.

CB M-1 Type "A" 2+72 Rd "C" Inv = 15.22 *1 Deflector Inlet

T.E.P. Plain Concrete Jacket

SMH 3-S 5'ø Shallow Drop 2+45.53 Rd "C" El 22.23 SE 22.3 SW 22.3 Inv = 13.15 Inv = 13.78

6" LAT 2+03 Rt. 0.0 Cu

2+95 1-Type "S" Service Lateral for Irrigation

3+56 ⅝-0" 1-12" Y ø Bend 1-Conc. Blk.

3+91 1-Type "D" Service Lateral

6" LAT 3+85 Rd "C" 32.6 Rt. Inv = 29.30

3+88 ⅝-0" Hel 1/32 Bend 1-Conc. Blk.

Sewer Easement in Favor of Keystone Investment, Inc.

SMH 3-S 5'ø=19.98 3+30 Rd "C" 3 Ht. 8 Ft. 0.2% Inv E 28.73 (24") Inv S 28.06 (8")

6" LAT 4+32 Rd "C" 34.0 Rt. Inv = 25.50

4+44 1-Type "C" Service Lateral

4+49 1-F.H. 1-12"x6" Tee, 1-6" G.V. (150') 1-Valve Box, 2-Conc. Blks., 27 L.F. 6" C.I. Pipe

G+04 ⅝-12" 1-12 1/2" Bend 1-Conc. Blk. Pipe

Existing Edge of Pavement

Approximate location of Existing Valves

G+25.93 Install C.I.C. St. Mon.

Existing F.H.

CONN. TO EXISTING 20" C.C. PIPE (Cl. 150) 1-20"x12" Tapping Sleeve, 12" Tapping Valve, (150') 1-Valve Box, 1-12" Sleeve 14' long, 1-Conc. Blk., 8 L.F. 12" CI. Pipe

Temp. For Testing 1-Temp. C.O. 4" M.J. Cap

0+00 Rd "C" 4+11 Rd "B"

0+09 1-12 1/2" T.V. Bend 1-Conc. Blk.

0+20 1-12 1/2" B.V. Bend 1-Conc. Blk.

SHALLOW SDMH A-2 0+21 Rd "C" Inv = 11.24 (18") Inv = 11.44 (21") Inv = 10.94 (30")

CB A-6 Type "B" 0+35 Rd "C" Inv = 12.02 -(18") Inv = 11.52 -(24")

CB A-7 Type "S" 2+15 Rd "C" Inv = 12.04 (18") Inv = 13.04 (18") *1 Deflector Inlet

SDMH A-3 ⅞-15" 1+23 Rd "C" Inv = 12.37

INLET L-1 ⅞-36" 1+28.62 Rd "C" Inv = 12.50 Type "S" 3"

6" LAT 1+51 Rt. 30.0 Cu

SHALLOW SDMH A-9 ⅞-12" 3+98 Rd "C" Inv = 21.90

& DRIVEWAY 4+25.00 Rd "C" At = 56°05'00"

3+16 1-Type "D" Service Lateral

& DRIVEWAY 2+49.00 Rd "E" At = 33°57'00"

CB A-8 Type "S" 5+75 Rd "C" Inv = 15.89 *1 Deflector Inlet

G+12 Pipe "C" Service Lateral for Irrigation

New ℄ for sight distance

SMOOTH CURVE

Radial Tangent Water Line

Tangent Water Line

Pt. 4+52.50 Install C.I.C. St. Mon.

35 L.F. OF HAKIMO RD. AND REPAVED BY CONTRACT) (NOT IN

APPROXIMATELY TO BE REALIGNED IN

EXISTING 20" WATER Approximate location

20' Wide Pvmt.

Property Line

Rt. Bck 19.43

1 1 Bck 50.33

End 50.50

Existing Edge of Pavement

Approximate location of existing 20" water to be verified in the field by the contractor

Top of Curb Grade

Finish Road

Plan Concrete Jacket

℄ CURVE DATA

Δ	= 41° 02' 02"
½	= 20° 31' 01"
R	= 480.00
T	= 179.63
C	= 336.46
L	= 343.76

BOTH CURB RETURNS

Δ	= 75° 58' 30"
½	= 37° 59' 15"
R	= 28.00
T	= 23.07
C	= 35.61
L	= 38.59
¼	= 19° 44' 37.5"
Ch	= 9.60

RIGHT CURB RET.

Δ	= 100° 30' 00"
½	= 50° 15' 30"
R	= 28.00
T	= 33.70
C	= 43.07
L	= 49.14
¼	= 25° 08' 15"
Ch	= 12.19

LEFT CURB RET.

Δ	= 75° 27' 00"
½	= 37° 43' 30"
R	= 28.00
T	= 23.27
C	= 35.75
L	= 36.88
¼	= 19° 51' 45"
Ch	= 9.66

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

PLAN AND PROFILE ROAD "C"

APPROVED

8/24/74	8/24/74	8/24/74	8/24/74
DATE	DATE	DATE	DATE
DEP. DIRECTOR DEPT. OF TRANS. SERV.	CHIEF DIVISION OF ENGINEERING	ASST. CHIEF ENGR. BWS (WATER)	DEPUTY MANAGER FOR SEWER AFFAIRS, BWS

SHEET 8 OF 44 SHEETS

155-32

TRUE NORTH
Scale: 1" = 40'

℄ CURVE DATA

Δ = 20° 12' 08"
Δ/2 = 10° 06' 04"
R = 250.00
T = 44.54
C = 87.69
L = 88.15

LEFT CURB RETURN

Δ = 37° 42' 00"
Δ/2 = 18° 51' 00"
R = 48.00
T = 16.30
Ch = 31.02
L = 31.58
Δ/2 = 18° 51' 00"
Ch = 15.72

RIGHT CURB RETURN

Δ = 27° 55' 00"
Δ/2 = 13° 57' 30"
R = 48.00
T = 11.93
Ch = 23.16
L = 23.30
Δ/2 = 13° 57' 30"
Ch = 11.66

CURB RETURN

Δ = 242° 57' 00"
Δ/2 = 121° 28' 30"
R = 32.00
L = 135.60
Δ/10 = 24° 17' 42"
Ch = 13.47

BOTH CURB RETURNS

Δ = 00° 00'
Δ/2 = 45° 00'
R = 28.00'
T = 28.00'
C = 39.60'
L = 43.98'
Δ/4 = 22° 30'
Ch = 10.83

PLAN ~ ROAD "D"

PROFILE ~ ROAD "D"

Scales: Horiz. 1" = 20'
Vert. 1" = 4'

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

PLAN AND PROFILE ROAD "D"

APPROVED

5/24/74 DATE	5/23/74 DATE	5/24/74 DATE	5/24/74 DATE
DEP. DIRECTOR DEPT. OF TRANS. SERV.	CHIEF DIVISION OF ENGINEERING	ASST. CHIEF ENGR. BWS (WATER)	DEPUTY MANAGER FOR SEWER AFFAIRS, BWS

SHEET 9 OF 44 SHEETS

True North
Scale: 1"=40'

FARRINGTON HIGHWAY

To Honolulu

To Waianae

ROAD "A"

PARKING "A"

3+67 ROAD "A"

5+72 ROAD "A"

214°17' — 622.10

Install 4' high Chain Link Fence

308°17' 47.00

124°17' 47.00

214°17' — 205.00

Existing Grade

Finish Grade

FF-158.2 421

FF-158.2 420

FF-160.2 419

Install 6' high Chain Link Fence

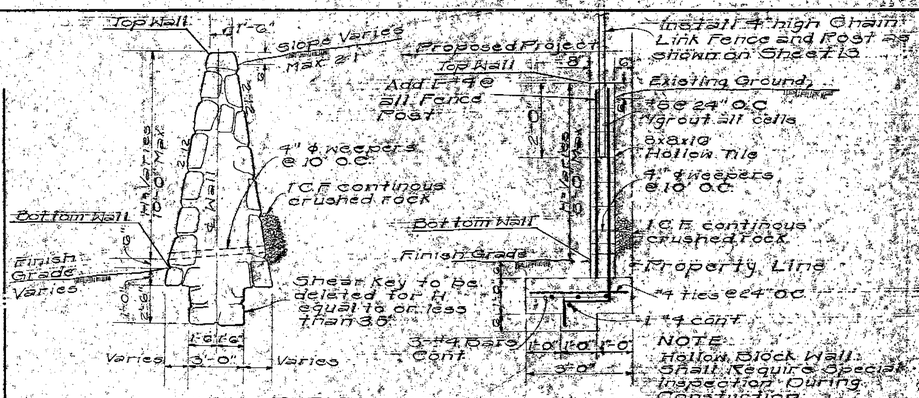
52°17' — 645.95

Install 4' high Chain Link Fence

MATCH LINE SEE SHEET 19

123° 57' 635.00

123° 57' 571.02



TYPICAL SECTIONS

CRM RETAINING WALL
Scale: 1/4"=1'-0"

HOLLOW TILE RETAINING WALL
Scale: 1/4"=1'-0"

NOTES:
1- For Parking Lot Details, see Parking Area Details, Sheets 20 thru 28 inclusive.
2- Exact location of walkways shall be determine in the field by the Architect.
3- Chain Link Fence shall be coordinated with the Architectural Plans.

DANIEL S. IWASA
REGISTERED PROFESSIONAL ENGINEER
No. 5443-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Daniel S. Iwasa
5/2/74
DATE

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NANAKULI, OAHU, HAWAII

SITE PLAN

APPROVED

DATE	DATE	DATE
5/2/74		
CHIEF DIVISION OF ENGINEERING		

SEE SHEET 12 MATCH LINE

ROAD "A"

ROAD "B"

ROAD "C"

ROAD "D"

ROAD "E"

ROAD "F"

PARKING "G"

PARKING "H"

PARKING "J"

PARKING "K"

Install 4' wide x 4' high Chain Link Walk Gate at Drainage Easement

Install 4' high Chain Link Fence at Drainage Easement

Install 4' high Chain Link Fence

True North
Scale: 1"=40'

KULEANA CHANNEL

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NANAKULI, OAHU, HAWAII

SITE PLAN

APPROVED

5/31/74 DATE	DATE	DATE
CHIEF DIVISION OF ENGINEERING		

DANIEL S. MIYASATO
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Daniel S. Miyasato

SEE SHEET 13 MATCH LINE

PARKING "B"
PARKING "D"
PARKING "C"
RECREATION PARKING
PARKING "F"
PARKING "A"
PARKING "E"
PARKING "M"
PARKING "N"
PARKING "O"
PARKING "G"
PARKING "L"
ROAD "B"
ROAD "C"
ROAD "D"
ROAD "E"
ROAD "F"
ROAD "G"
ROAD "H"
ROAD "J"
ROAD "K"
ROAD "L"
ROAD "M"
ROAD "N"
ROAD "O"
ROAD "P"
Chain Link Fence
True North
Scale: 1" = 40'

MATCH LINE SEE SHEET 11

REVISION	DATE	DESCRIPTION	APPROVED

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NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

SITE PLAN

APPROVED

5/23/74
DATE

CHIEF DIVISION OF ENGINEERING

DATE

DATE

DANIEL S. MYASAKI
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Daniel Myasaki

SEE SHEET 14 MATCH LINE

SEE SHEET 12 MATCH LINE

SEE SHEET 10 MATCH LINE

ROAD "C"

ROAD "B"

ROAD "A"

HAKIMO ROAD

Install 4' high Chain Link Fence

End Wall

Retaining Wall with 4' high Chain Link Fence For Details See Sheet 10

Retaining Wall, For Details See Sht. 10

PARKING "S"

PARKING "T"

PARKING "R"

PARKING "Q"

PARKING "2"

RECREATION CENTER FF=18'

True North
Scale: 1"=40'

DANIEL S. MIYASATO
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Daniel Miyasato

REVISION	DATE	DESCRIPTION	APPROVED

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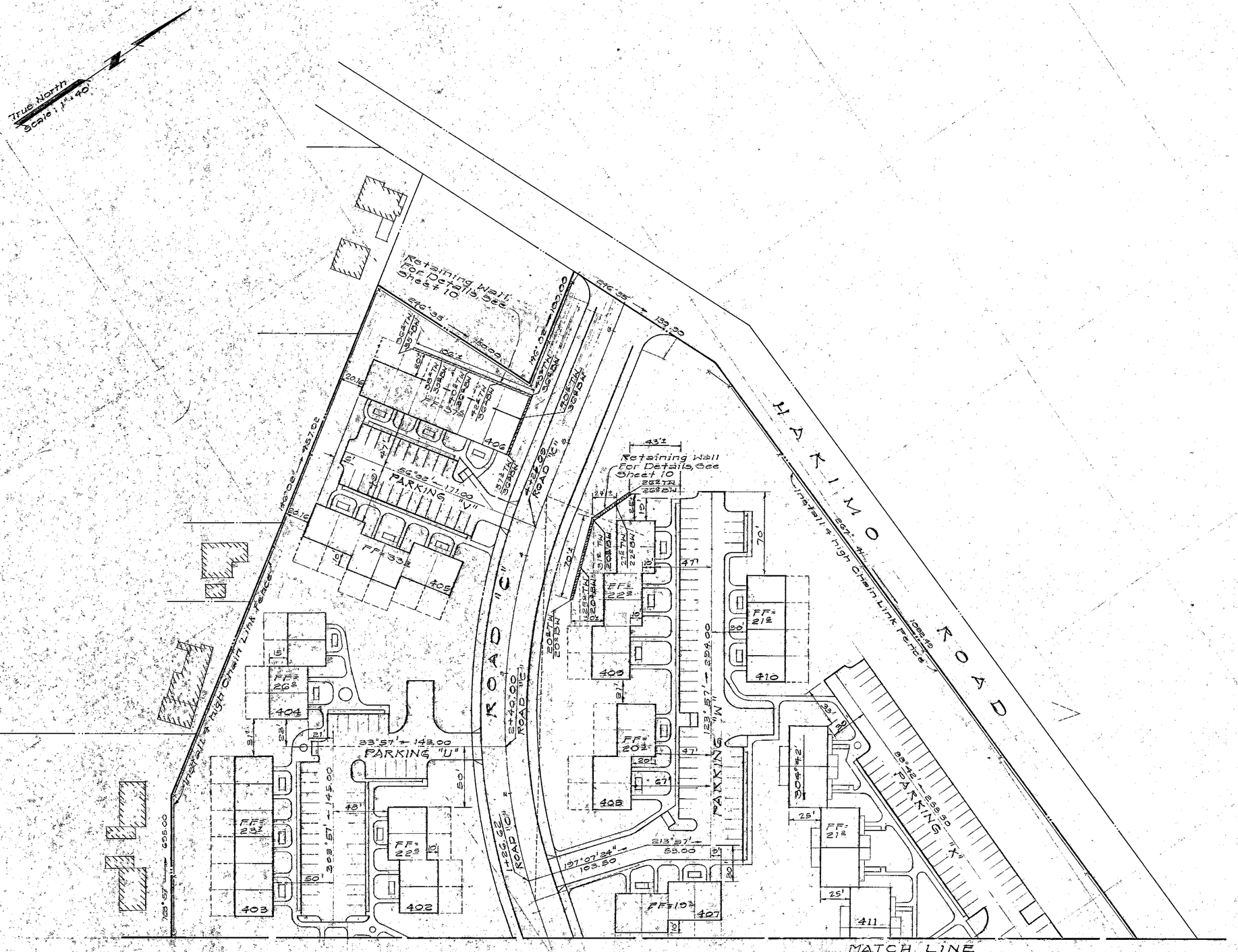
NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

SITE PLAN

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DATE	DATE	DATE
CHIEF DIVISION OF ENGINEERING		



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NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

SITE PLAN

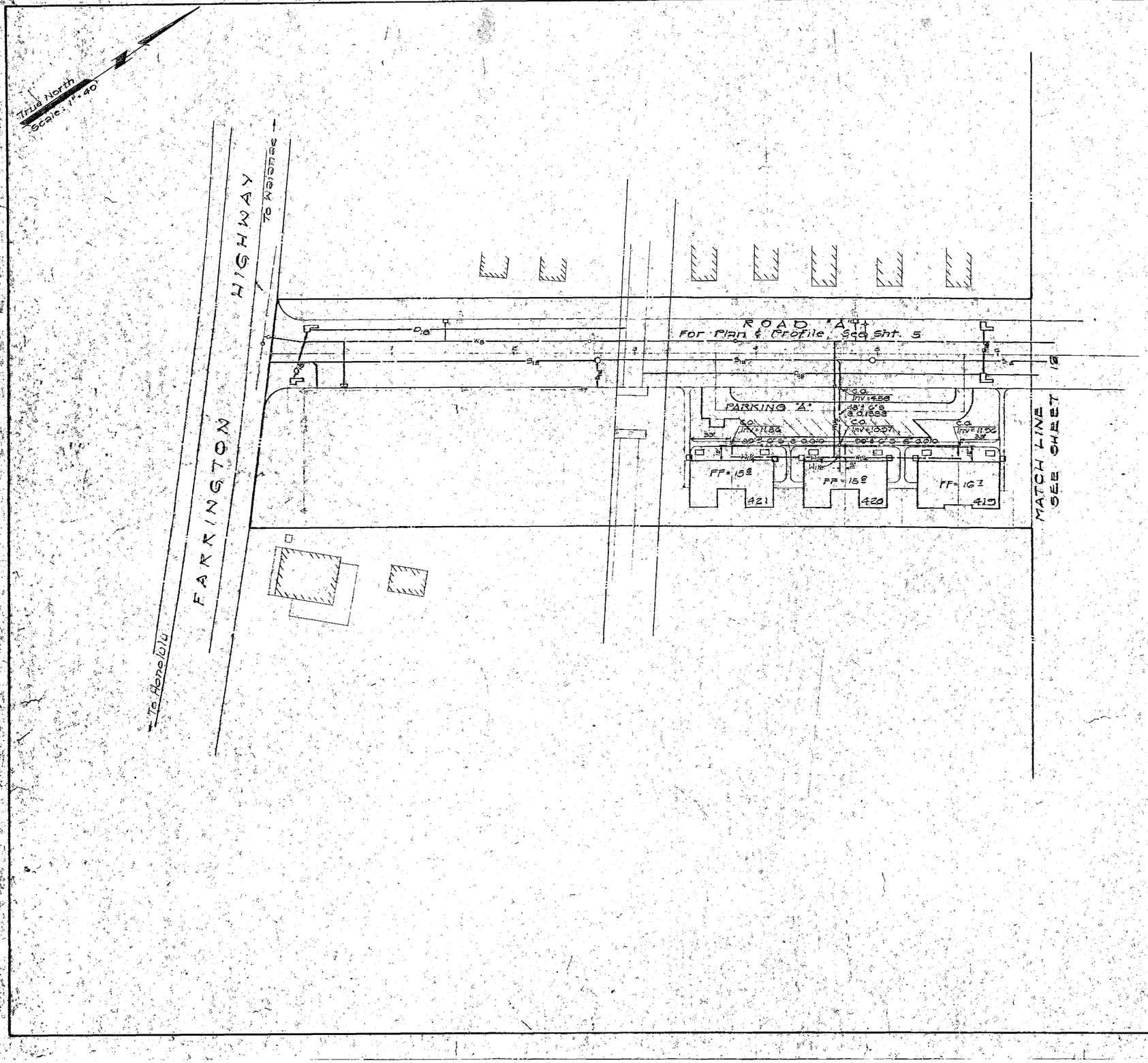
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DATE	DATE	DATE
CHIEF DIVISION ENGINEERING		

DANIEL S. MIYASATO
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HAWAII, U.S.A.

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Daniel S. Miyasato



LEGEND

- D — Drain Line
- S — Sewer Line
- W — Water Line
- CO — Cleanout
- 3/4" — Hose Bibb with 3/4" line
- Hose Bibb — Hose Bibb at Building or Fence
- FF=15.2 — Finish Floor Elevation

NOTE:
Water and Sewer laterals connections within 5' or less from the buildings to be cordinated with the Mechanical Plans (Under separate contract)

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

UTILITY PLAN

DANIEL S. MIYASATO
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Daniel S. Miyasato

APPROVED:

5/1/74	5/6/74	
DATE	DATE	DATE
CHIEF DIVISION OF ENGINEERING	ASST. CHIEF ENGR. PWS (WATER)	

SEE SHEET 17 MATCH LINE

ELEVATION

SECTION "H-H"

DETAIL - OUTLETS "N", "U" & "Z"

No. SCALE

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NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

UTILITY PLAN

APPROVED:

DANIEL S. MIYASATO
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CHIEF DIVISION OF ENGINEERING

DEPUTY CHIEF OF ENGR. BWS (WATER)

SEE SHEET 18 — MATCH LINE

PARKING "B" — PARKING "C" — PARKING "D" — PARKING "E" — PARKING "F" — PARKING "G" — PARKING "H" — PARKING "I" — PARKING "J"

REC. CTR. PARKING

ROAD "D" (FROM ROAD "C" TO ROAD "G")

True North
Scale: 1" = 40'

MATCH LINE — SEE SHEET 16

REVISION	DATE	DESCRIPTION	APPROVED

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NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

UTILITY PLAN

DANIEL S. NYASATO — REGISTERED PROFESSIONAL ENGINEER — No. 3443-E — HAWAII, U.S.A.

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DATE	DATE	DATE
5-2-74	5-2-74	
CHIEF DIVISION OF ENGINEERING	ASSIST. CHIEF ENGR. SWS (WATER)	

SHEET 17 OF 74 SHEETS

SEE SHEET 19 MATCH LINE

Pl. "X" For Profile, See Sht 26

TRUE NORTH
Scale: 1" = 40'

PARKING "S"

PARKING "T"

PARKING "R"

PARKING "Q"

PARKING "U"

PARKING "V"

PARKING "W"

ROAD "B" For Plan & Profile See Sht 25

ROAD "A" For Plan & Profile See Sht 25

SEE SHEET 5

RECREATION CENTER FF=19.2

INLET H-1 Type V-2 See Sht 29 Inv.=11.55

INLET F-1 Type V-2 See Sht 29 Inv.=10.52

INLET F-2 Type V-2 See Sht 29 Inv.=11.09

INLET E-1 Type V-2 See Sht 29 Inv.=9.00 (18") Inv.=8.10 (24") Inv.=8.00 (30")

INLET E-2 Type V-2 See Sht 29 Inv.=11.06

INLET C-1 Type V-2 See Sht 27 Inv.=12.33

INLET E-4 Type V-2 See Sht 29 Inv.=12.00

INLET E-5 Type V-2 See Sht 29 Inv.=13.00

SEWERLINE G See Sht. 27 For Profile

SEWERLINE 16 See Sht. 27 For Profile

SEWERLINE 18 See Sht 28 For Profile

SEWERLINE N-2 See Sht. For Profile

Pl. "S" For Profile See Sht 26

Pl. "T" For Profile See Sht 26

Pl. "U" For Profile See Sht 26

Pl. "W" For Profile See Sht 26

2+32 Dwy Sta 1"-1" Service Lateral 1-1" Double Hub Fitting

2+55 Dwy Sta. 1"-1" Service Lateral 1-1" Double Hub Fitting

3+02.77 Dwy Sta 1-1" Ya Bend 1-Conc. Block

3+20.77 Dwy Sta (Rt) 1-1" Ya Bend 1-Conc. Block

4+00 Dwy Sta 1"-1" Service Lateral 1-1" Double Hub Fitting 2-1" Gate Valve 1-2" G.V. (150) 1-3" G.V. (150) 2-Valve Box 10'-4" C.I.P. 2-Cond Blocks

4+95 1"-1" Air Relief Valve (NP=150 psi) 1-Air Valve Box

7+00 Dwy Sta. (Rt) 0+00 W.L. Sta. 1-1" Ya Bend 1-Conc. Blk.

0+23 W.L. Sta. 1-1" Ya Bend 1-Conc. Blk.

20' Wide Water Easement in Favor of BWS

VOORHEIS, TRINDLE NELSON

DANIEL S. MIYASATO REGISTERED PROFESSIONAL ENGINEER No. 4418 HAWAII, U.S.A.

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Daniel S. Miyasato

NO.	DATE	DESCRIPTION	APPROVED

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ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

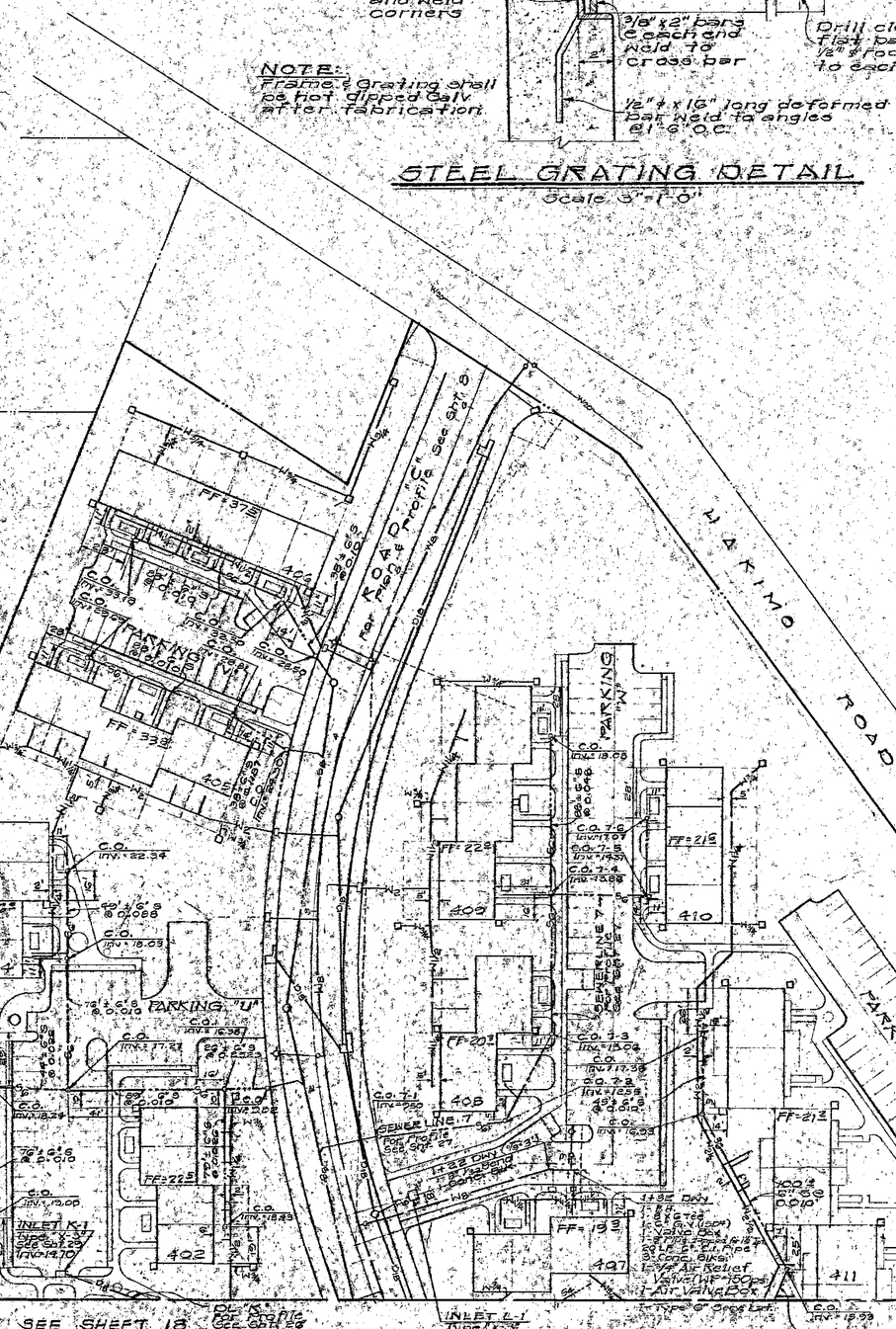
UTILITY PLAN

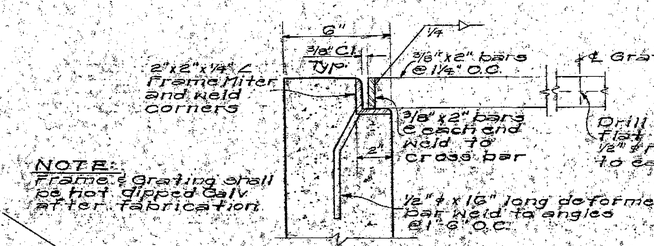
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DATE	DATE	DATE
CHIEF DIVISION OF ENGINEERING	ASST. CHIEF ENGR. BWS (WATER)	

MATCH LINE SEE SHEET 17

True North
Scale: 1"=40'

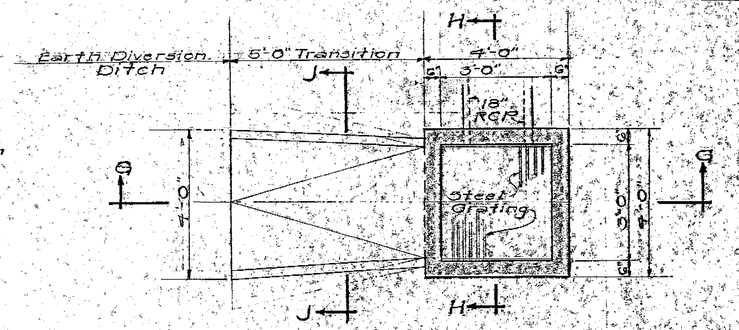




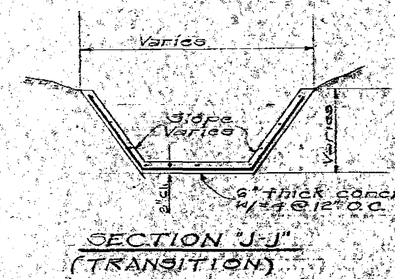
NOTE:
Frame & Grating shall be hot dipped Galv after fabrication

STEEL GRATING DETAIL

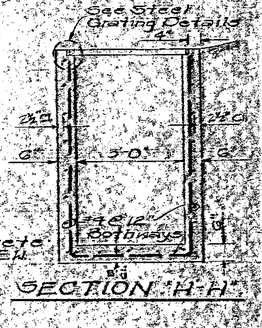
Scale 3"=1'-0"



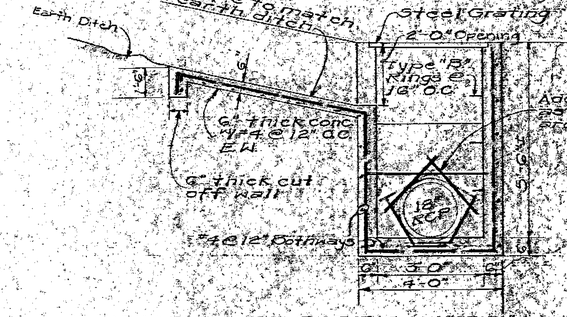
PLAN



SECTION "J-J"
(TRANSITION)



SECTION "H-H"



SECTION "H-H"
DETAILS - INLET "2-0"
Not to Scale

REVISION	DATE	DESCRIPTION	BY	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

UTILITY PLAN

REGISTERED PROFESSIONAL ENGINEER No. 3643-E HAWAII, U.S.A.

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APPROVED

DATE	DATE	DATE
CHIEF DIVISION ENGINEERING	ASST. CHIEF ENGR. SWS (WATER)	

SHEET 19 OF 44 SHEETS

DRAIN LINE "E"

DRAIN LINE "K"

DRAIN LINE "N"

DRAIN LINE "U"

DRAIN LINE "H"

DRAIN LINE "P"

DRAIN LINE "Q"

DRAIN LINE "S"

DRAIN LINE "T"

DRAIN LINE "U"

DRAIN LINE "V"

DRAIN LINE "X"

DRAIN LINE "Z"

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

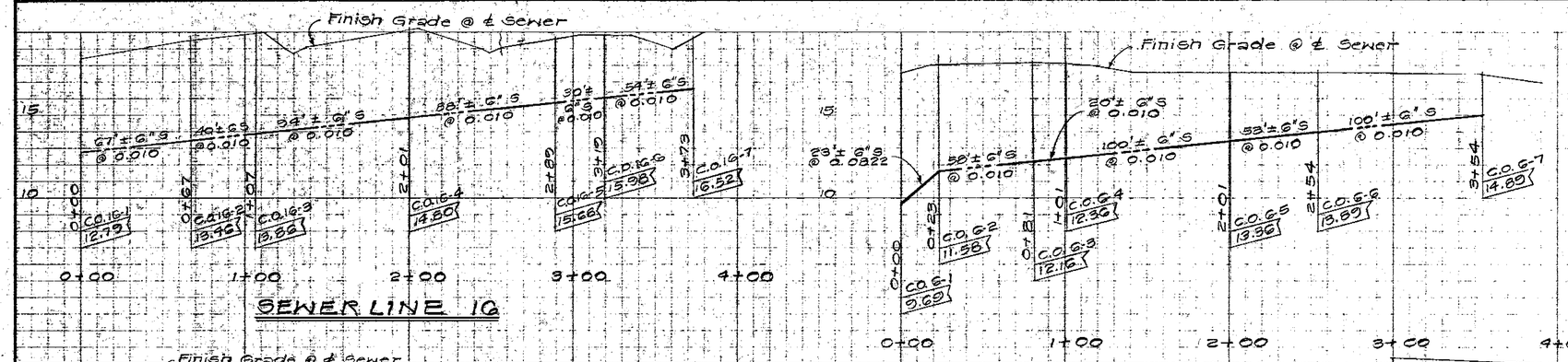
DRAIN PROFILES

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

JAMES S. MIYASHIRO
REGISTERED PROFESSIONAL ENGINEER
No. 4443
STATE OF HAWAII

APPROVED:

DATE		
CHIEF DIV. ENGINEER		



REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

SEWER PROFILES

41C

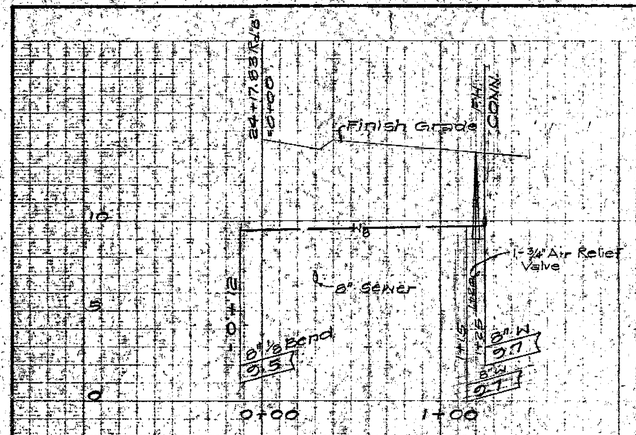
APPROVED:

DATE:

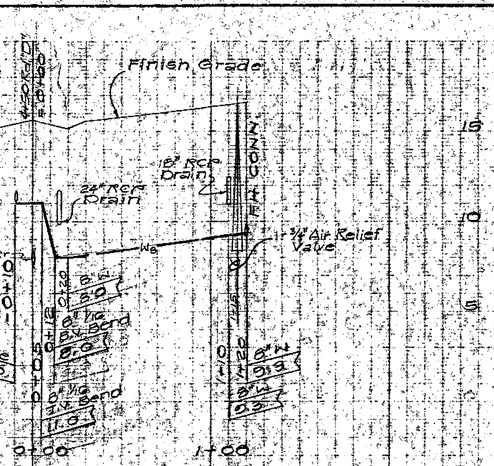
DANIEL E. IWASAKO
REGISTERED PROFESSIONAL ENGINEER
No. 5448-E
HAWAII, U.S.A.

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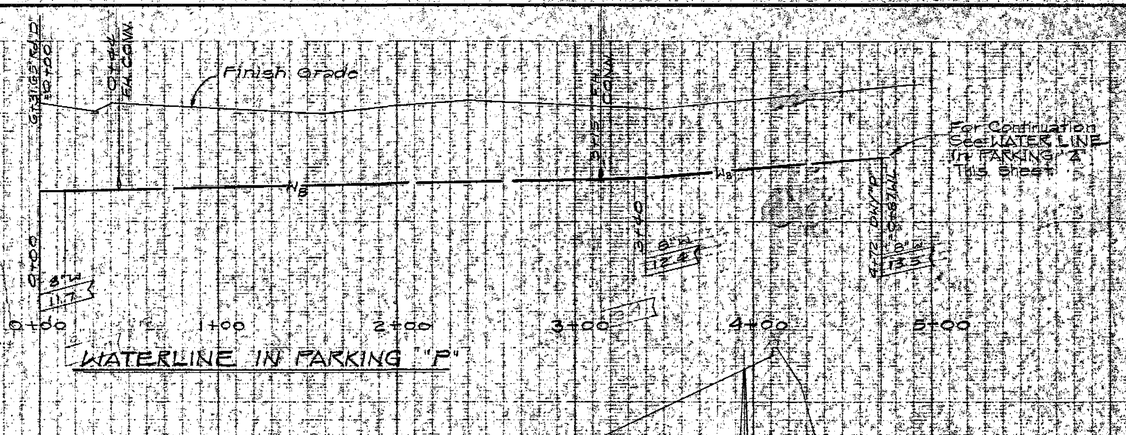
Daniel E. Iwasako



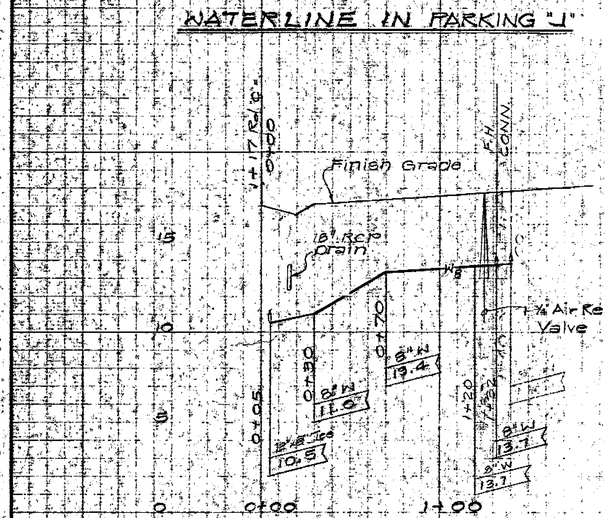
WATERLINE IN PARKING "J"



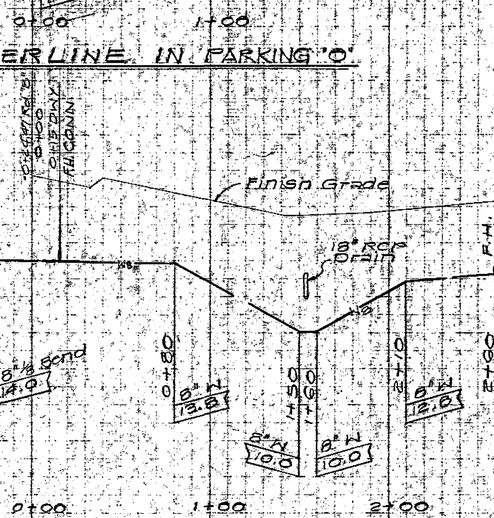
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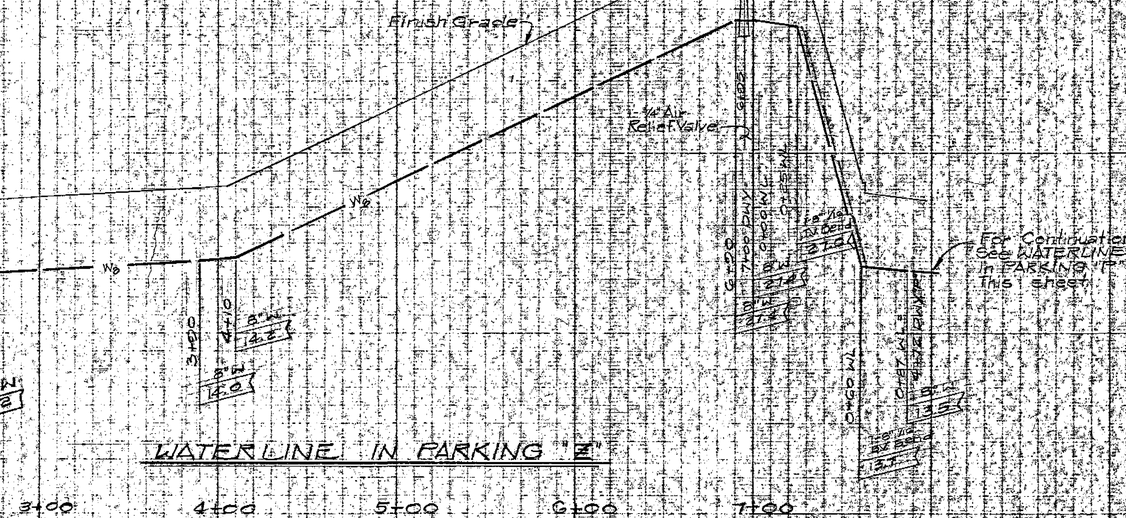
WATERLINE IN PARKING "P"

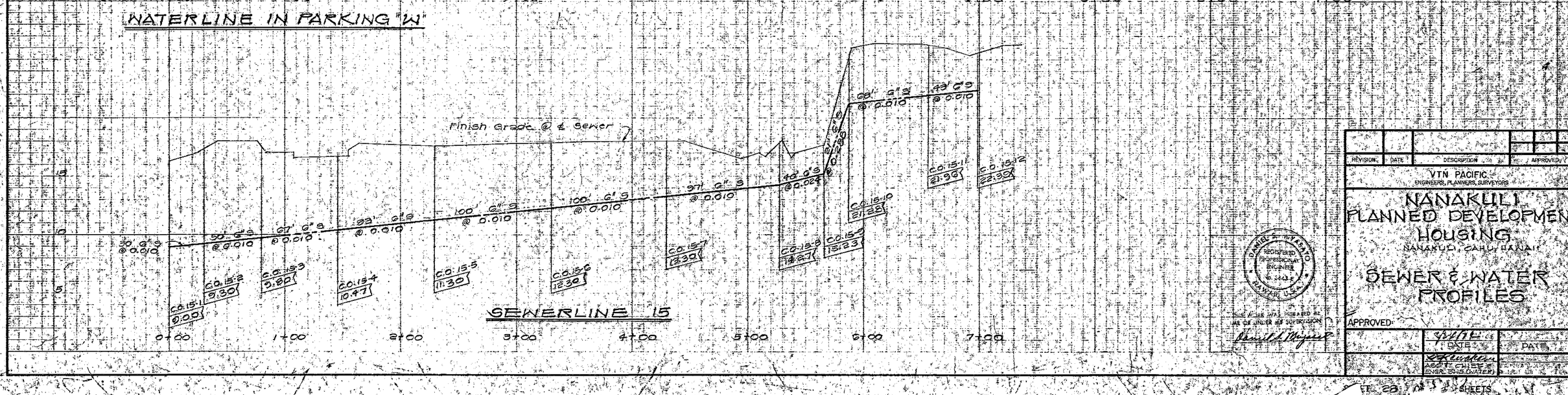


WATERLINE IN PARKING "W"



WATERLINE IN PARKING "E"





SEWERLINE 15

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

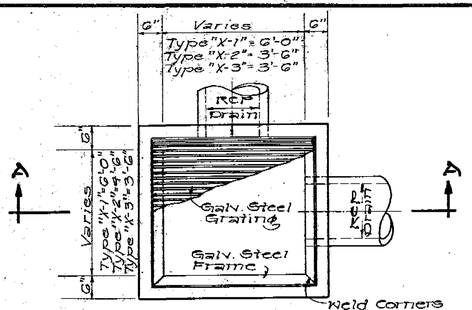
SEWER & WATER PROFILES

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Ronald Meyer

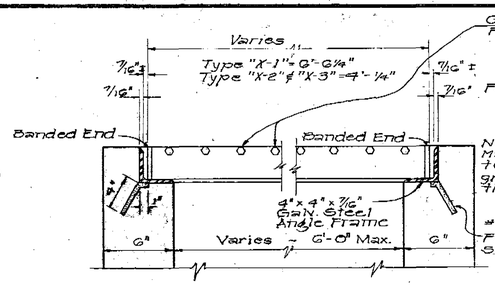
APPROVED:

	DATE	DATE
	CITY ENGR. (SEWER)	CITY ENGR. (WATER)

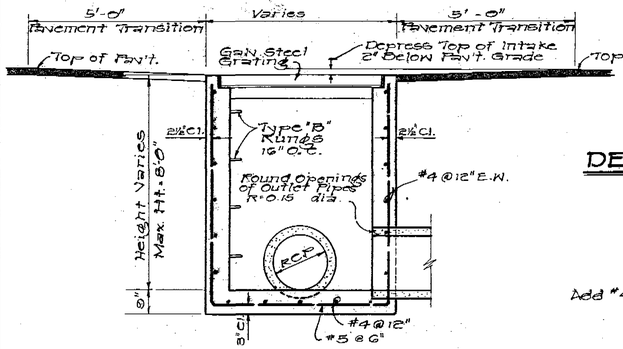
SHEETS



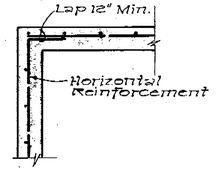
PLAN



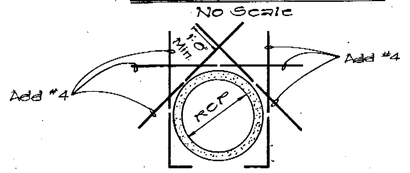
GRATING DETAIL



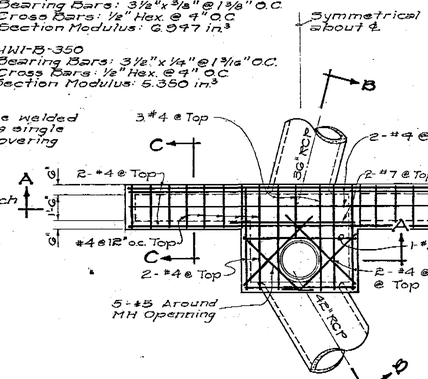
SECTION "A~A"



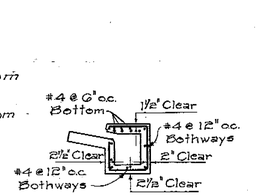
DETAIL ~ REINFORCEMENT AT CORNERS



ADDITIONAL REINFORCEMENT AT PIPE OPENINGS

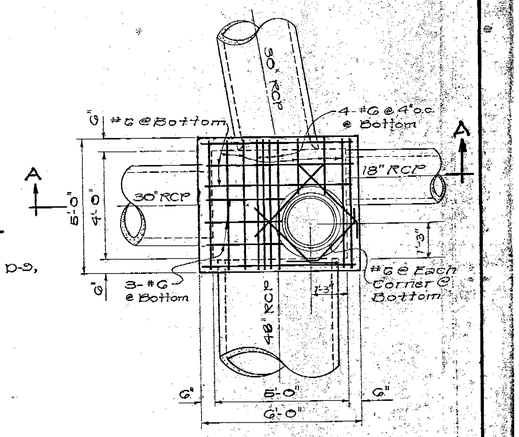


PLAN

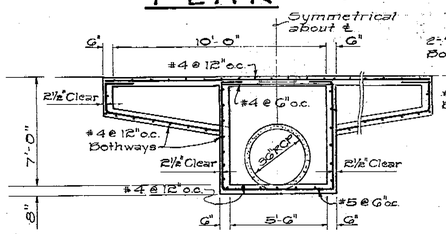


SECTION "C~C"

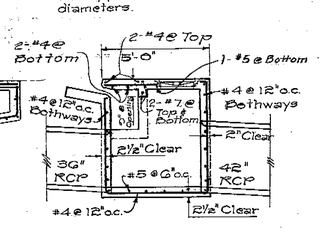
NOTES:
1. See C&C Standard Details, Sht. D-9, for reinforcement at pipes and corners.
2. Spliced reinforcing bars shall be lapped at least 30 diameters.



PLAN



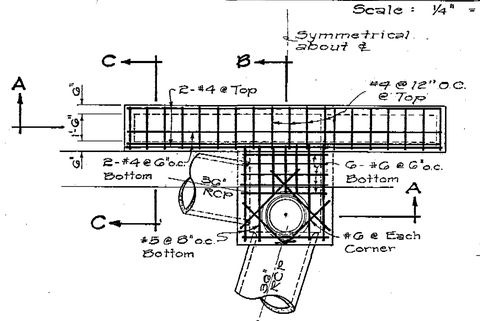
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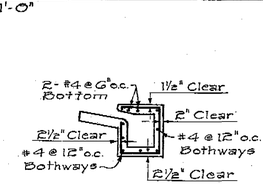


SECTION "B~B"

DETAILS ~ CATCH BASIN "U-1"

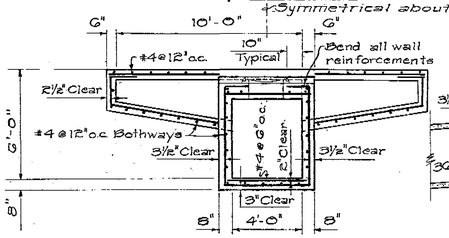
Scale : ¼" = 1'-0"



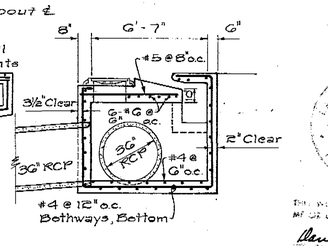


SECTION "C~C"

NOTES:
1. See C&C Standard Details, Sheet D-9, for reinforcement at pipes and corners.
2. Spliced reinforcing bars shall be lapped at least 30 diameters.



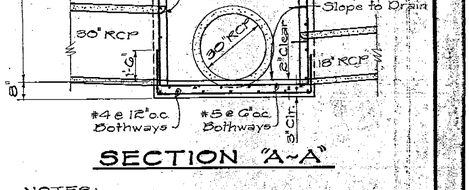
SECTION "A~A"



SECTION "B~B"

DETAILS ~ CATCH BASIN "U-2"

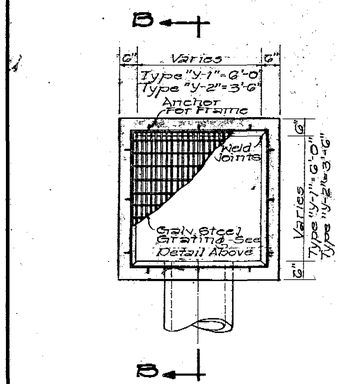
Scale : ¼" = 1'-0"

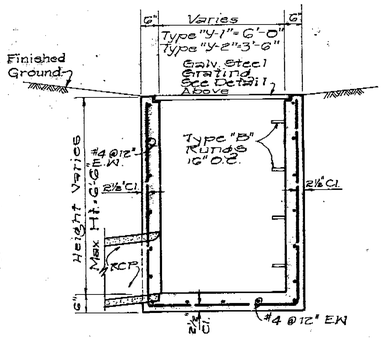


NOTES:
1. See C&C Standard Details, Sheet D-21, for channelizing detail.
2. See C&C Standard Details, Sheet D-9, for reinforcement at pipes and corners.
3. Rungs shall not be installed over a pipe connection and the lowest rung shall be not more than 2'-0" above the invert.

DETAILS ~ SDMH "A-1"

Scale : ⅜" = 1'-0"

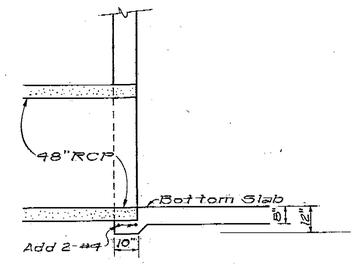




SECTION "B~B"

DETAILS ~ TYPE "Y" DRAINAGE INTAKE

Scale : ½" = 1'-0"



TYPICAL BOTTOM SLAB @ 48" RCP CONNECTION

Scale : ⅜" = 1'-0"

DETAILS ~ TYPE "X" DROP INTAKE

No Scale

REVISION	DATE	DESCRIPTION	APPROVED

VTN PACIFIC
ENGINEERS, PLANNERS, SURVEYORS

NANAKULI PLANNED DEVELOPMENT HOUSING

NANAKULI, OAHU, HAWAII

MISCELLANEOUS DETAILS

APPROVED

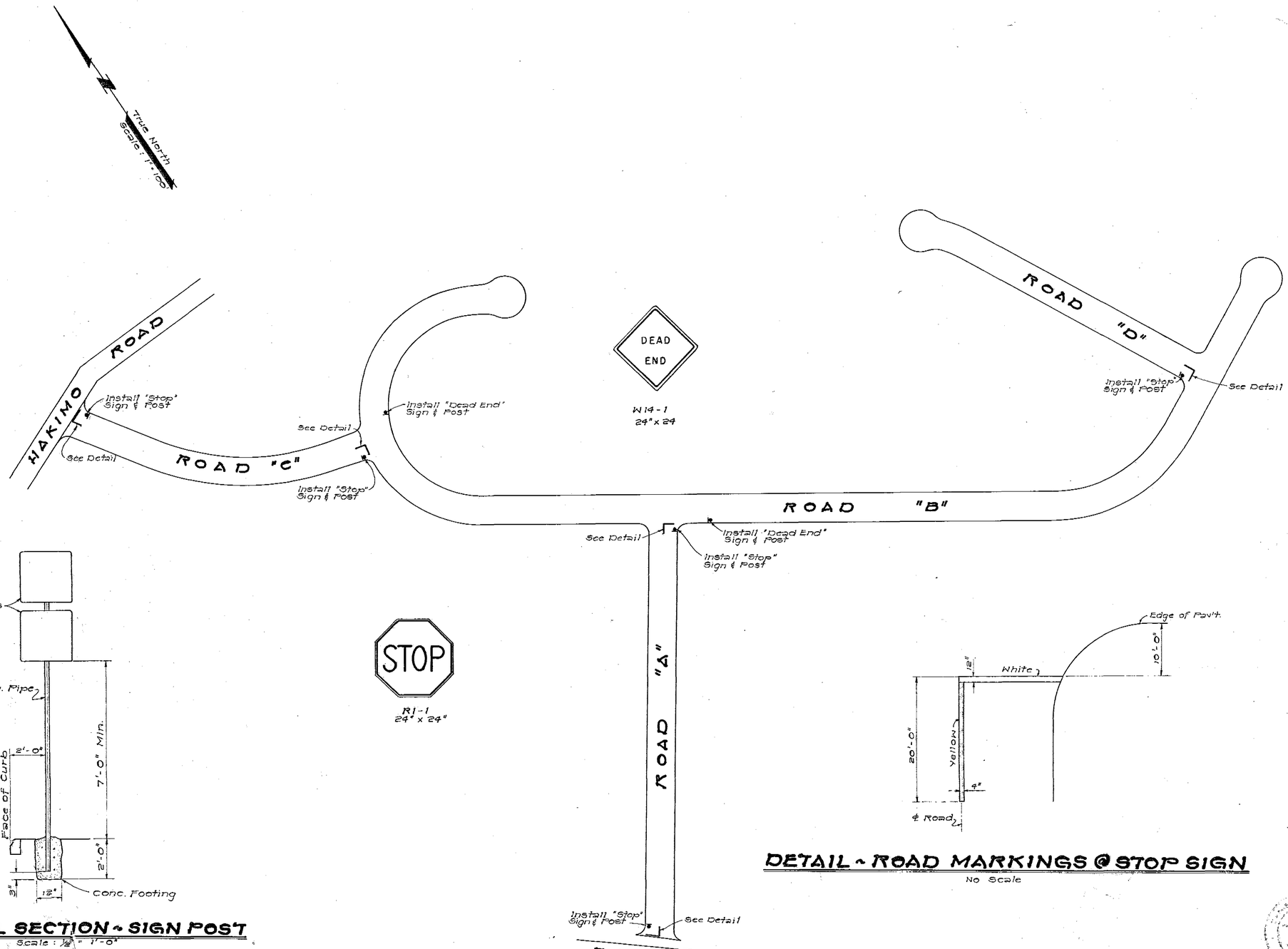
5/7/74
DATE

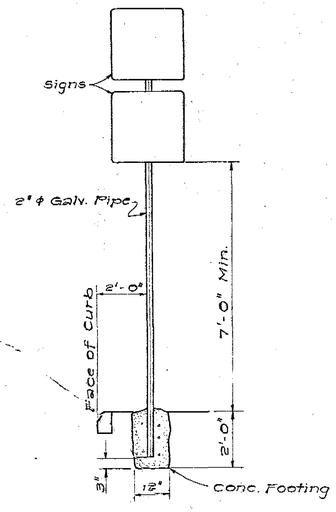
CHIEF DIVISION OF ENGINEERING

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Daniel S. Miyasaki

SHEET 20 OF 28 SHEETS





TYPICAL SECTION ~ SIGN POST

Scale: 1/2" = 1'-0"

DETAIL ~ ROAD MARKINGS @ STOP SIGN

No Scale

REVISION	DATE	DESCRIPTION

VTN P
ENGINEERS

SHEET

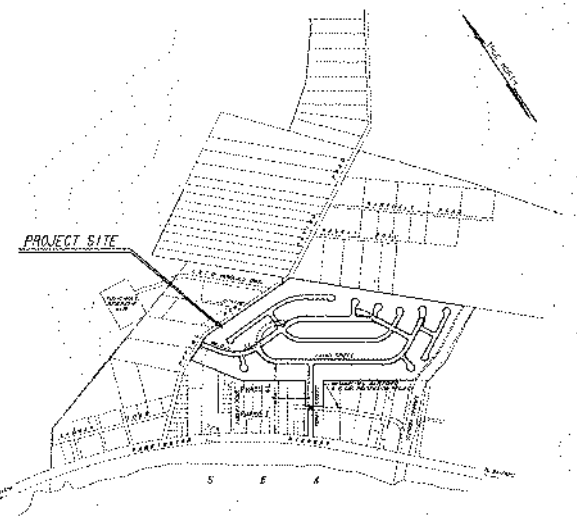
PRINCESS KAHANU ESTATES
SUBDIVISION — PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

TAX MAP KEY 8-7-07:4 AND 8-7-33:14 & 19

OWNER : DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

DEVELOPER : PRINCESS KAHANU DEVELOPMENT CORPORATION



LOCATION MAP

GRAPHIC SCALE IN FEET
500 0 500' 1000'
1"=500'

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	CONSTRUCTION NOTES
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5	TYPICAL ROAD SECTIONS & DETAILS
6	LEGEND, ABBREVIATIONS, MISCELLANEOUS DETAILS
7 - 8	PLAN & PROFILE - POHAI STREET
9 - 13	PLAN & PROFILE - LAIKU STREET
14 - 18	PLAN & PROFILE - WAIOLU STREET
19 - 20	PLAN & PROFILE - ~~KOLEA ST.~~ PUALEILANI ST.
21	PLAN & PROFILE - ~~KOLEA ST.~~ KALEIWOHE ST.
22	PLAN & PROFILE - ~~ROAD "B" AND ROAD "C"~~ KALEIWOHE ST. & PONAIAKEONE PL.
23	PLAN & PROFILE - ~~ROAD "D" AND ROAD "E"~~ WAIOLU PL. & MANAIAKALANI PL.
24	PLAN & PROFILE - ~~ROAD "F" AND ROAD "G"~~ LAIKŪ PL. & WAIOLU ST.
25	PLAN & PROFILE - ~~ROAD "H"~~ LA'ANOI ST.
26	PLAN & PROFILE - DRAIN LINE "L-A" & "L-1"
27	PLAN & PROFILE - SEWER LINE "L-A" & "F-1"
28 - 31	TRAFFIC CONTROL PLAN
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34	SEWER DETAILS
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40	CORROSION PROTECTION INSTALLATION NOTES
41	CATHODIC PROTECTION ANODE GROUNDED INSTALLATION
42 - 60	ELECTRICAL PLANS

AS-BUILT PLANS

APPROVED

DIRECTOR, DEPARTMENT OF HAWAIIAN HOME LANDS — DATE
STATE OF HAWAII

MANAGER AND CHIEF ENGINEER — DATE 12/6/94
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

DIRECTOR AND CHIEF ENGINEER — DATE
DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

ACTING — 10/12/94
DIRECTOR — DATE
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY RIGHT-OF-WAY ONLY)

DIRECTOR — DATE
DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN CITY RIGHT-OF-WAY ONLY)

for — 10/6/94
CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION — DATE
DEPARTMENT OF HEALTH
STATE OF HAWAII

DIRECTOR — DATE
DEPARTMENT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

CHIEF, HIGHWAYS DIVISION — DATE
DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

95-013S

DEC 13 1994

~~JDD-95-13S~~

CALVIN B. K. KIM — REGISTERED PROFESSIONAL ENGINEER — NO. 7789-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

CALVIN KIM & ASSOC., INC.

4-4-2-1

BWS WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, AND THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS," VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS

2. NUTS AND BOLTS FOR FLANGED CONNECTIONS WITHIN METER BOXES SHALL BE BRONZE OR STAINLESS STEEL EXCEPT COUPLING ADAPTERS WHERE "COR-TEN" (U.S. STEEL) OR "MAYARI" (BETHLEHEM STEEL) MAY BE USED. FLANGED CONNECTIONS OUTSIDE OF METER BOX MAY USE "COR-TEN" OR "MAYARI" TYPE NUTS AND BOLTS

3. TEST PRESSURE SHALL BE ONE OF THE FOLLOWING:

   a. PREVAILING LINE PRESSURE. JOINTS LEFT EXPOSED FOR 24 HOURS TO CHECK FOR LEAKS PRIOR TO BACKFILL.

   b. 150 PSI

4. THE CONTRACTOR SHALL CHLORINATE THE ENTIRE INSIDE SURFACE OF EACH PIPE AND FITTING WITH DISINFECTION SOLUTION OF 5 OUNCES OF SODIUM HYPOCHLORITE MIXED WITH 10 GALLONS OF WATER (FOR DISINFECTION ONLY)

5. THE CONTRACTOR SHALL NOTIFY BWS PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION, ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.

6. CONTRACTOR SHALL CUT AND PLUG ALL EXISTING UNUSED LATERALS AT THE MAIN WHETHER OR NOT SHOWN ON THE PLANS. METER AND VALVE BOXES TO BE ON ALREADY ABANDONED SHALL BE DEMOLISHED OR REMOVED AND PROPERLY DISPOSED OF. THE DAMAGED AREA SHALL BE REPAIRED TO AN EQUAL OR BETTER CONDITION THAN THE IMMEDIATE AREA. ALL WORK SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.

7. ALL PLANS APPROVED BY THE BOARD OF WATER SUPPLY ARE MADE SOLELY ON THE ACCURACY OF THE WATER SUPPLY. ALL OTHER FEATURES OF THE WATER SYSTEM, SUCH AS LINES, GRADES, FITTINGS, DRAINAGE, ETC., AND OTHER FEATURES OF IMPROVEMENTS SHALL NOT BE THE RESPONSIBILITY OF THE BOARD OF WATER SUPPLY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WATER LINES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ESPECIALLY CAREFUL WHEN EXCAVATING BENEATH WATER LINES. JETS AND MONDS WHEREVER THERE IS A POSSIBILITY OF WATER LINE MOVEMENT DUE TO REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURE NECESSARY TO PROTECT THE WATER LINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BWS APPROVAL) AND/OR MODIFYING HIS CONSTRUCTION METHOD

9. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES

10. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL CAST IRON (GRAY OR DUCTILE) FITTINGS FOR THE PROJECT CONFORM IN ALL RESPECTS TO THE WATER SYSTEM STANDARDS, DATED 1985.

11. POLYBOND SHAPE FOR MECHANICAL JOINT GLANDS AS REQUIRED IN AWWA STANDARD C111 SHALL BE "STRAIGHT-SIDED" OR AN APPROVED EQUAL, ON A JOB TO JOB BASIS

12. REAPPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.

13. ALL WATER CONSTRUCTION REQUIRING SHUTDOWN SHALL BE SCHEDULED FOR AFTER WORKING HOURS AND MAXIMUM DOWNTIME SHALL BE SIX (6) HOURS

14. PRESSURE DISINFECTION ARE RECOMMENDED FOR ALL LOTS

15. UNLESS OTHERWISE SPECIFIED, ALL LATERALS AND CONNECTIONS SHALL BE PLASTIC TYPE "C-1" WITH BLIND METER SPACE LENGTHS TO ACCOMMODATE 3/4" METERS.

16. WATER COMMITMENT SHALL BE CANCELLED IF THE APPROVED CONSTRUCTION PLANS ARE ALLOWED TO LAPSE.

17. THE CONTRACTOR SHALL FURNISH AND INSTALL DIELECTRIC COUPLINGS FOR ALL COPPER SERVICE LATERAL CONNECTIONS.

18. ADEQUATE OFFSITE FIRE PROTECTION MEETING THE BWS STANDARD SHALL BE INSTALLED AND COMPLETED PRIOR TO CONSTRUCTION OF HOMES INCLUDING MODEL HOMES.

19. AT THE ELECTRICAL/SIGNAL OVERLINE WATER CROSSINGS, ADJUST ALL ELECTRICAL/SIGNAL OVERLINE ELEVATIONS TO MAINTAIN 6" VERTICAL CLEAR SEPARATION FROM ALL WATERLINES (12" CLEAR FOR ALL ELECTRICAL/SIGNAL OVERLINE STRUCTURES LARGER THAN 15"). AT NO COST TO THE BOARD OF WATER SUPPLY.

20. MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATERLINE SYSTEMS AND NEAREST ELECTRICAL/SIGNAL OVERLINES PARALLELING THE WATER SYSTEM AT NO COST TO THE BOARD OF WATER SUPPLY.

21. MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN STREET LIGHT/TRAFFIC SIGNAL STANDARDS (INCLUDING ANY MODULAR UNITS) AND THE NEAREST WATER SYSTEM. CONTRACTOR SHALL FIELD VERIFY FOR ANY CONFLICTS AT EACH STREET LIGHT/TRAFFIC SIGNAL STANDARD LOCATION WHERE CONFLICTS OCCUR. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER TO REVISE THE STREET LIGHT/TRAFFIC SIGNAL STANDARD TO PROVIDE THE REQUIRED CLEARANCES AT NO COST TO THE BWS

22. THE CONTRACTOR/DEVELOPER SHALL OBTAIN A NOISES PERMIT PRIOR TO CHLORINATION AND/OR DEWATERING. A COPY OF THE PERMIT SHALL BE SUBMITTED TO THE BOARD OF WATER SUPPLY, PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION

23. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES SHALL BE SUPPLIED WITH A FUSION BONDED EPOXY COATING. NO BLENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE, ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID OR BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE AND ALL NON-METALLIC LATERALS.

24. ALL POLYVINYL CHLORIDE (PVC) PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY USE OF PVC DEFLECTION COUPLINGS.

25. ALL PVC FITTINGS FOR CLASS 150 C-900 PVC PIPES SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) C-907. ALL TYPES OF FITTINGS NOT SPECIFIED IN AWWA C-907 ARE NOT APPROVED.

26. REACTION BLOCK REQUIREMENTS FOR PVC FITTINGS SHALL BE OF THE SAME AS FOR DUCTILE IRON FITTINGS.

27. PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BOARD, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM IN ALL RESPECTS TO AWWA C-907.

TRAFFIC NOTES FOR WORK ON C&C STREETS

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS IN THE STATE OF HAWAII", ADDRESS OF THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI, "TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".

3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.

4. DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE TWO LANES FOR THROUGH TRAFFIC ON STREETS TOO NARROW TO HAVE THIS PRACTICABLE. THE CONTRACTOR MAY WORK ON ONE-HALF OF THE ROADWAY, KEEPING THE OTHER HALF OPEN TO TRAFFIC AND ALTERNATING THE FLOW OF TRAFFIC.

5. DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL, AND ALL LANES SHALL BE OPENED TO TRAFFIC.

6. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.

7. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.

8. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

9. THE CONTRACTOR SHALL REPLACE, TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES, ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT 523-4026 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POSTS AND PAVEMENT MARKINGS.

10. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.

11. STATE DEPARTMENT OF HAWAIIAN HOME LANDS SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE #2.

ELECTRICAL AND MAINTENANCE SERVICE DIVISION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.

2. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE STREET LIGHTING SYSTEM (PHONE 527-6092).

3. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE 527-5207).

4. STREET LIGHTING AND TRAFFIC SIGNALS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION OR CHANGEOVER REQUIRED SHALL BE APPROVED BY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES AND PERFORMED AND PAID FOR BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING STREET LIGHTING AND TRAFFIC SIGNAL FACILITIES AND DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY'S COUNTY OF HONOLULU.

28. THE USE OF HUB CLAMPS AND SET SCREWS ON PVC FITTINGS IS NOT APPROVED

29. THE CONTRACTOR SHALL ADJUST ALL MANHOLE FRAMES/VALVE BOXES WITHIN THE RESURFACED AREA. PRIOR TO RESURFACING, BWS WILL INITIALLY LOCATE ALL WATER MANHOLES/VALVE BOXES THAT WILL REQUIRE ADJUSTMENTS. THE CONTRACTOR SHALL THEN BE RESPONSIBLE FOR RELOCATING THESE MANHOLES/VALVE BOXES TO FACILITATE THE ADJUSTMENTS. THE COST FOR ADJUSTMENTS SHALL BE MADE AT THEIR RESPECTIVE UNIT PRICES IN THE BID BASED ON THE ACTUAL NUMBER ADJUSTED. COST FOR RELOCATING SHALL BE INCIDENTAL AND SHALL NOT BE PAID FOR DIRECTLY. ANY ADDITIONAL REQUEST TO BWS TO AGAIN LOCATE THE MANHOLES/VALVE BOXES SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR AND WILL ENGAGE AND BILL THE CONTRACTOR FOR ALL COST FOR SAID ADDITIONAL WORK)

30. ANY ADJUSTMENTS TO THE EXISTING WATER SYSTEM REQUIRED DURING CONSTRUCTION TO MEET REQUIREMENTS OF BWS STANDARDS, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE DONE BY THE CONTRACTOR AT NO COST TO THE BOARD.

31. PRIOR TO ANY EXCAVATING, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.

32. BWS WILL NOT SEND COMPLETION NOTICE TO DLNR UNTIL EASEMENT DOCUMENTS ARE SUBMITTED TO BWS AND RECORDED

33. UPON COMPLETION OF THE PROJECT, THE DEVELOPER SHALL PROVIDE THE BWS A CERTIFICATE FROM A REGISTERED SOILS ENGINEER CERTIFYING THAT THE ROAD PRISM HAS BEEN CONSTRUCTED IN ACCORDANCE TO CITY AND COUNTY ROAD STANDARDS.

34. ACCORDING TO THE SOIL RESISTIVITY AND PH TEST "PRINCESS KAHANU ESTATES SUBDIVISION" DATED APRIL 26, 1994 BY HAWAII GEOTECHNICAL GROUP, INC., THE SOIL HAS A CORROSION RATING OF "1". THE CONTRACTOR SHALL PROVIDE CORROSION PROTECTION MEASURES CONSISTENT FOR A CORROSION RATING OF "1", AS STATED IN THE BWS "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS" VOLUME 3, DATED 1991.

35. PRIOR TO METER BEING ISSUED, THE DEPARTMENT OF HAWAIIAN HOMELANDS SHALL DEACTIVATE THE WATER USE PERMIT TO THE BWS WAIAHOLE #1 WELLS

36. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT BACKFILL HAS A RESISTIVITY GREATER THAN 5000 OHM-CM.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, SEPTEMBER 1986, THE DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS, SEPTEMBER 1984, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT VOLUME 1, JULY 1993

2. IN THE EVENT THAT ANY CHANGES IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICTS WITH OTHER FACILITIES, THE ENGINEER IN CHARGE OF THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES WHICH AND TO BE ACCEPTED TO THE DEPARTMENT OF WASTEWATER MANAGEMENT FOR APPROVAL.

3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DEPARTMENT OF WASTEWATER MANAGEMENT, AT 527-5020 OR 523-4345, TO ARRANGE FOR INSPECTION SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN DAYS PRIOR TO COMMENCEMENT OF SEWER WORK.

4. CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED

5. TREES IN THE ROAD RIGHT-OF-WAY SHALL BE SATURATED A MINIMUM OF 5'-0" FROM THE CITY'S SEWER LINES.

6. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA.

7. SEWER LATERAL LOCATION MEASURED ALONG THE FRONT PROPERTY LINE SHALL BE 5'-0" FROM THE PROPERTY CORNER UNLESS OTHERWISE NOTED ON THE PLANS AND SHOULD NOT STRADDLE ELECTRICAL TRANSFORMER PAD

8. SLOPE FOR SEWER LATERALS SHALL BE 1.00% UNLESS OTHERWISE NOTED.

9. SPLICING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.

11. THE CONSULTING ENGINEER SHALL SUBMIT TO THE DEPT. OF WASTEWATER MANAGEMENT MYLAR "AS-BUILT" TRACINGS OF THE CONSTRUCTION PLANS AS ACTUALLY CONSTRUCTED, SHOWING ALL CHANGES FROM THE ORIGINAL PLANS.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE DISPOSING AND ANALYZING PROCEDURES

13. THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.

14. FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(C)(1), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:

   1. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
      a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
      b. LIFELINE AND ASSOCIATED CLIPS
      c. RESCUE/EGRESS AND FALL PROTECTION EQUIPMENT.
      d. TWO-WAY RADIOS (WALKIE-TALKIES), IF OUT OF LINE-OF-SIGHT.
      e. EMERGENCY ESCAPE RESPIRATOR (10 MINUTE DURATION).
      f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE
      g. CONTINUOUS GAS DETECTOR (CALIBRATED TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES) CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
      h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
   2. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
   3. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).

15. ALL DROP AND SHALLOW DROP SEWER MANHOLES SHALL BE LINED WITH PLASTIC LINERS, ALSO, IF THE VELOCITY EXCEEDS 10 FPS, THE SEWER MANHOLE SHALL BE PLASTIC LINED.

16. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR ADVANCE SEWER RISER AGREEMENT AT THE DEPT. OF WASTEWATER MANAGEMENT AND OBTAIN PLUMBING PERMIT BEFORE ANY ADVANCE RISER IS MADE.

17. ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER

18. SEWER PIPES 33 INCHES AND LARGER SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED INTERNALLY WITH LINING.

19. EMC PIPE CRADLE SEALS SHALL BE INSTALLED TO EACH PIPE AT ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION.

20. GEOTEXTILE FABRIC TO ENVELOP THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.

21. DPWL SHALL PAY TO THE CITY THE APPLICABLE WASTEWATER SYSTEM FACILITY CHARGE.

22. THE PRINCESS KAHANU ESTATES COMMUNITY ASSOCIATION SHALL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE SEWER SYSTEM OUTSIDE OF THE PUBLIC ROAD RIGHT-OF-WAY.

23. THE DEPARTMENT OF HAWAIIAN HOMELANDS (DHHL) SHALL GRANT AN EASEMENT IN FAVOR OF THE CITY AND COUNTY OF HONOLULU THROUGH A LICENSE AGREEMENT FOR MAINTENANCE OF THE SEWER SYSTEM WITHIN THE ROADWAY EASEMENT (RIGHT-OF-WAY.

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1984, AS AMENDED, AND THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU.

2. ALL EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.

3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 527-5231, TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.

4. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY SPECIFIC LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

5. BENCH MARKS SHALL BE ESTABLISHED ON NEW STREET MONUMENTS AND THE DATA SUBMITTED TO THE DIVISION OF ENGINEERING.

6. ALL EXISTING IMPROVEMENTS WITHIN THE CITY'S JURISDICTION OR CITY MAINTAINED ROAD R/W THAT ARE DISTURBED DURING THE CONSTRUCTION PHASE SHALL BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION AT NO COST TO THE CITY.

7. FOR BENCHMARK, SEE SHEET C-6

STREET NAME SIGNS

1. STREET NAME SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE DEPARTMENT OF TRANSPORTATION SERVICES. THE EXACT LOCATION SHALL BE DETERMINED BY THE DIRECTOR OF TRANSPORTATION SERVICES. IN LIEU OF THE STANDARD EMBOSSED SIGNS, REFLECTORIZED STREET NAME SIGNS AND SIGN BRACKETS IDENTICAL TO THAT PRESENTLY USED BY THE DEPARTMENT OF TRANSPORTATION SERVICES MAY BE INSTALLED.

LIST OF EXEMPTIONS BY DEPARTMENT OF HAWAIIAN HOME LANDS

(PERTAINING TO DEPARTMENT OF TRANSPORTATION SERVICES & DEPARTMENT OF PUBLIC WORKS)

A. THE DESIGN SPEED OF NEW 56-FT WIDE ROADWAYS SHALL BE 25 MPH.

   1. SIGHT DISTANCE PROPERTY LINE SETBACK DESIGNED FOR 25 MPH IN LIEU OF 30 MPH AT THE FOLLOWING INTERSECTIONS:
      a. MAIOLU STREET AND ROAD "A" (P.I. STA. 9+35.15 MAIOLU ST.)
      b. MAIOLU STREET AND ROAD "A" (P.I. STA. 21+59.94 MAIOLU ST.)
      c. MAIOLU STREET AND LAIKU STREET.
      (SIGHT DISTANCE FOR 30 MPH SHALL BE PROVIDED WITHIN PROPERTIES.)
   2. VERTICAL CURVE (STA. 0+28.39 TO 1+78.39 MAIOLU ST.) IS 150' INSTEAD OF 200'.

B. EXISTING ROADWAYS SHALL NOT BE RECONSTRUCTED TO MEET CURRENT MINIMUM CENTERLINE RADIUS REQUIREMENTS.

   1. CURVES AFFECTED: LAIKU STREET STA. 0+92.39 TO STA. 2+86.80 (CENTERLINE R = 200.00' IN LIEU OF 380').
      LAIKU STREET STA. 14+01.62 TO STA. 17+02.55 (CENTERLINE R = 200.00' IN LIEU OF 380')

C. CONSTRUCTION OF MAKANO ROAD FRONTAGE IMPROVEMENTS SHALL BE DEFERRED UNTIL SUCH TIME THAT THE CITY AND COUNTY OF HONOLULU UNDERTAKES A FULL WIDENING OF MAKANO ROAD. THE DEPARTMENT OF HAWAIIAN HOME LANDS WILL PAY ITS FAIR SHARE AT THAT TIME FOR THE COST OF IMPROVEMENTS FRONTING ITS SITE.

APPROVED:

CITY TRAFFIC ENGINEER AND DIVISION DEPARTMENT OF TRANSPORTATION SERVICES CITY & COUNTY OF HONOLULU — DATE
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)

APPROVED:

CHIEF ENGINEER, DEPARTMENT OF WASTEWATER MANAGEMENT CITY & COUNTY OF HONOLULU — DATE 10/12/94
(FOR CONSTRUCTION WITHIN STATE R/W ONLY)

APPROVED:

DIVISION OF CONSERVATION AND RESOURCE ENFORCEMENT DEPARTMENT OF LAND AND NATURAL RESOURCES STATE OF HAWAII — DATE 11/15/95

NO.	REVISION	DATE	APPROVED

95-0135

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

CONSTRUCTION NOTES

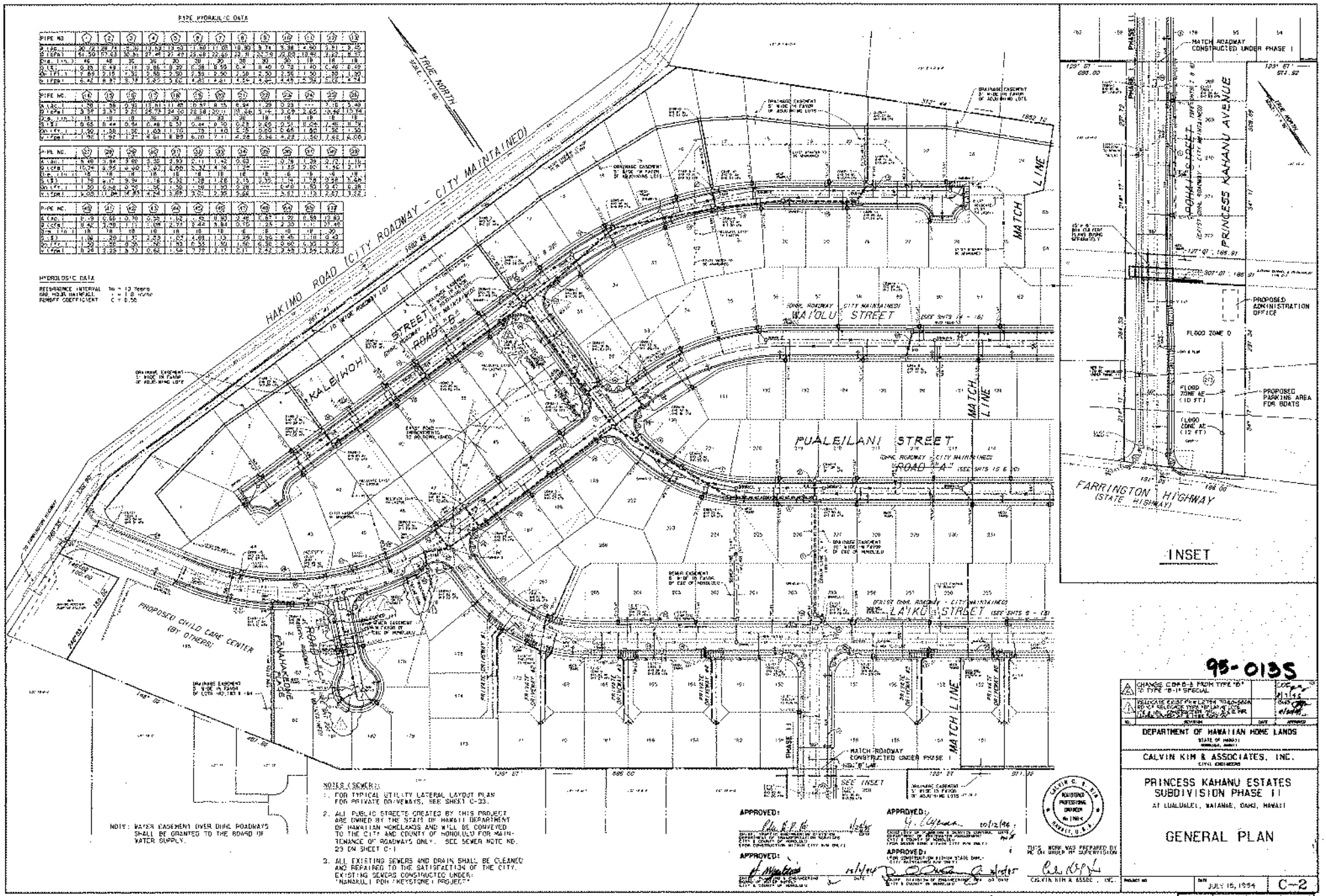
CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — NO. 7376 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC. — PROJECT NO. — DATE JULY 18, 1994 — C-1

AS BUILT — SHEET 2 OF 61 SHEETS

FILE — FOLDER — NO. 2 2 2 2

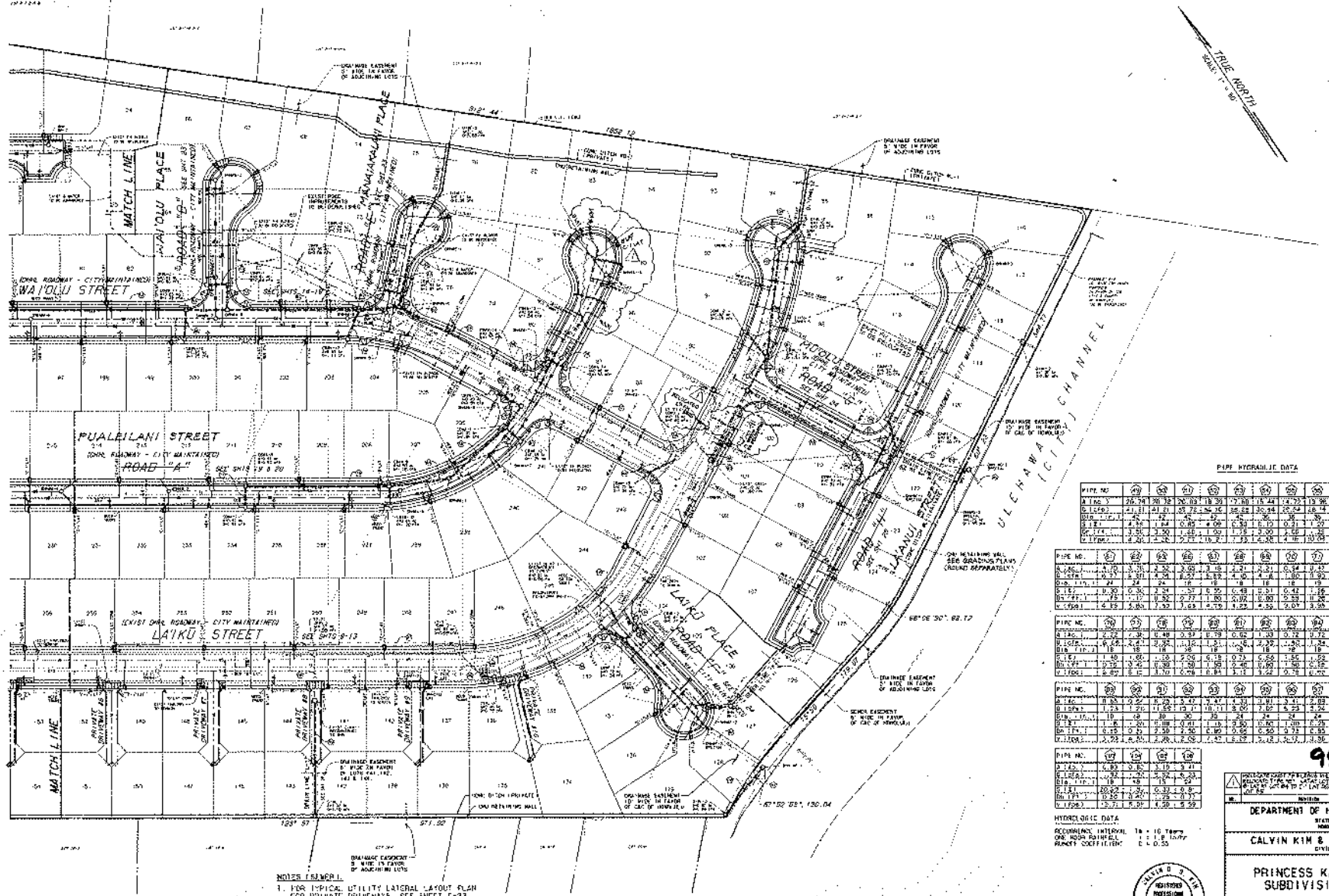


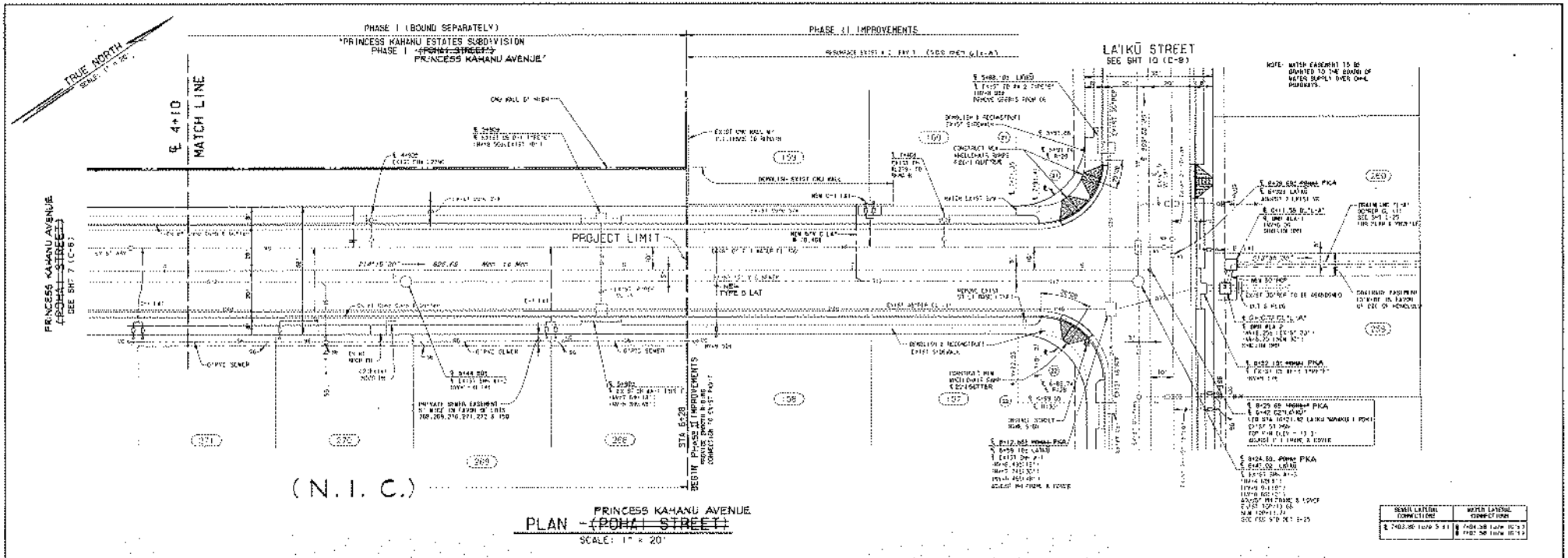
PIPE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
A (AC.)	20.72	20.74	21.30	13.93	13.93	11.80	11.80	10.90	9.74	9.38	4.50	2.91	2.25
Σ (CFS)	61.50	61.63	30.31	27.41	27.49	23.68	22.60	22.1	22.58	20.08	10.80	7.22	4.37
Dia. (in.)	48	48	30	30	30	30	30	30	30	30	18	18	18
S (%)	0.25	0.49	.18	0.86	0.92	0.38	0.55	0.4	0.40	0.78	1.40	0.46	0.49
Qn (cfs)	72.65	72.15	35.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50
V (FPS)	5.42	6.37	5.72	5.62	5.62	4.84	4.61	4.5	4.59	4.09	6.11	4.09	2.47

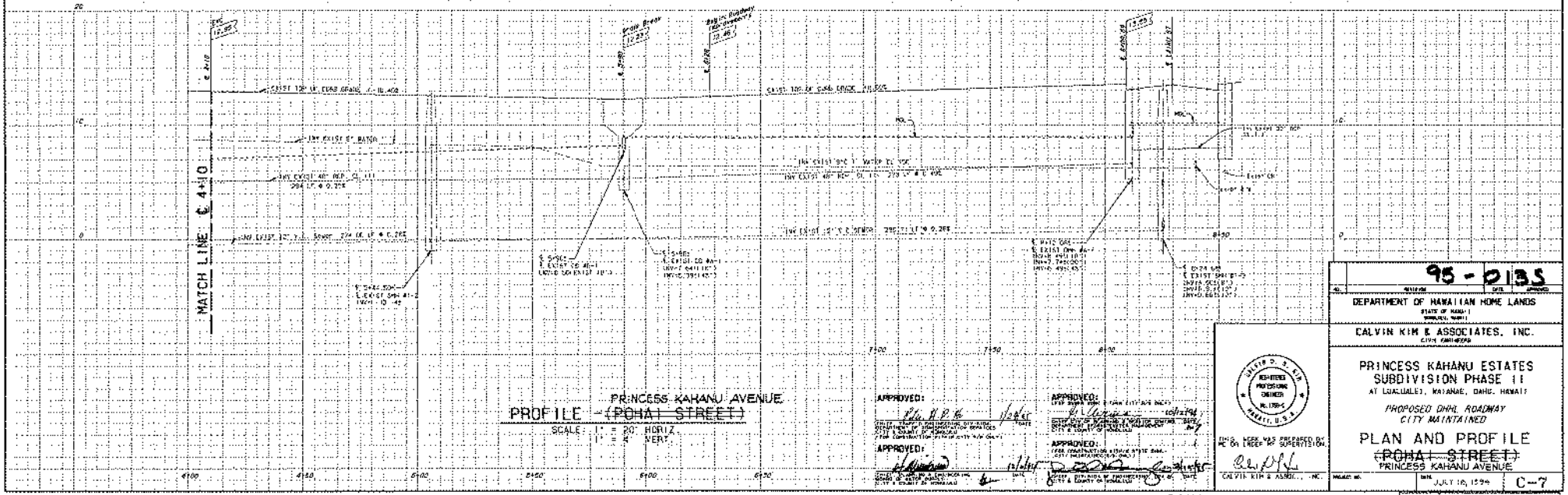
PIPE NO.	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖
A (AC.)	1.40	.38	0.75	15.81	11.45	10.97	8.15	6.94	.29	0.23	---	7.16	5.49
Σ (CFS)	3.59	3.33	2.27	25.73	24.50	22.58	20.11	18.66	3.16	2.59	2.62	16.46	15.74
Dia. (in.)	18	18	18	30	30	30	30	30	18	18	18	18	18
S (%)	0.65	0.44	0.84	0.48	0.57	0.44	0.30	0.23	0.65	0.41	0.64	0.48	0.39
Qn (CFS)	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50
V (FPS)	2.03	1.89	1.28	4.61	4.51	4.27	3.80	3.66	0.89	0.73	0.74	4.65	4.45

PIPE NO.	㉗	㉘	㉙	㉚	㉛	㉜	㉝	㉞	㉟	㊱	㊲	㊳	㊴
A (AC.)	4.46	11.94	3.80	3.38	2.93	---	1.42	0.63	---	0.78	1.28	2.73	1.10
Σ (CFS)	15.74	8.96	6.40	7.67	6.00	5.37	4.19	1.24	---	1.25	3.00	5.40	2.17
Dia. (in.)	18	18	18	18	18	18	18	18	---	6	18	18	18
S (%)	1.76	4.17	9.54	1.78	5.32	1.28	1.68	2.15	---	1.74	0.78	1.78	1.44
Qn (CFS)	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50	---	2.40	1.80	9.47	6.28
V (FPS)	4.08	11.94	14.93	4.24	9.69	9.04	8.56	5.68	---	1.61	1.13	3.82	3.22

PIPE NO.	㊵	㊶	㊷	㊸	㊹	㊺	㊻	㊼	㊽	㊾	㊿	(51)	(52)
A (AC.)	0.19	0.66	0.70	0.55	1.62	1.62	0.92	3.46	0.87	1.92	0.58	12.80	
Σ (CFS)	0.42	2.09	1.11	1.09	2.77	3.42	1.84	0.10	.25	2.30	---	21.46	
Dia. (in.)	18	18	18	18	18	18	18	6	6	18	---	18	
S (%)	1.06	.39	1.43	.07	1.69	1.12	.29	0.35	0.45	.11	---	0.40	
Qn (CFS)	2.30	2.30	2.30	2.30	2.30	2.30	1.90	0.90	0.90	0.95	2.30		
V (FPS)	0.24	1.18	0.63	0.62	1.54	1.94	1.04	1.27	1.42	1.30	0.74	6.82	


TRUE NORTH
SCALE: 1" = 80'
MATCH LINE
MATCH LINE
WAIOLU STREET
(EXIST. ROADWAY - CITY MAINTAINED)
WAIOLU PLACE
ROAD "B"
MANAWAHUA PLACE
ROAD "C"
MOOLU STREET
ROAD "D"
PUALEILANI STREET
(EXIST. ROADWAY - CITY MAINTAINED)
ROAD "A"
LAIKU STREET
(EXIST. ROADWAY - CITY MAINTAINED)
LAIKU PLACE
ROAD "E"
KAMANI STREET
ROAD "F"
ULEHAWA (CITY) CHANNEL
PRIVATE DRIVEWAY #1
PRIVATE DRIVEWAY #2
PRIVATE DRIVEWAY #3
PRIVATE DRIVEWAY #4
DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS
DRAINAGE EASEMENT 10' WIDE IN FAVOR OF CITY OF HONOLULU
SEWER EASEMENT 15' WIDE IN FAVOR OF CITY OF HONOLULU
DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS AND CITY OF HONOLULU
DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS AND CITY OF HONOLULU
DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS





APPROVED:
DIRECTOR OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU — DATE 12/26/95
APPROVED:
CHIEF ENGINEER, DEPARTMENT OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 10/27/94
APPROVED:
DIRECTOR OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU — DATE 12/26/95
APPROVED:
DIRECTOR OF PLANNING & PERMITTING, CITY & COUNTY OF HONOLULU — DATE

I HEREBY CERTIFY THAT THIS PLAN AND PROFILE WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC. — DATE

95 - 0135
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

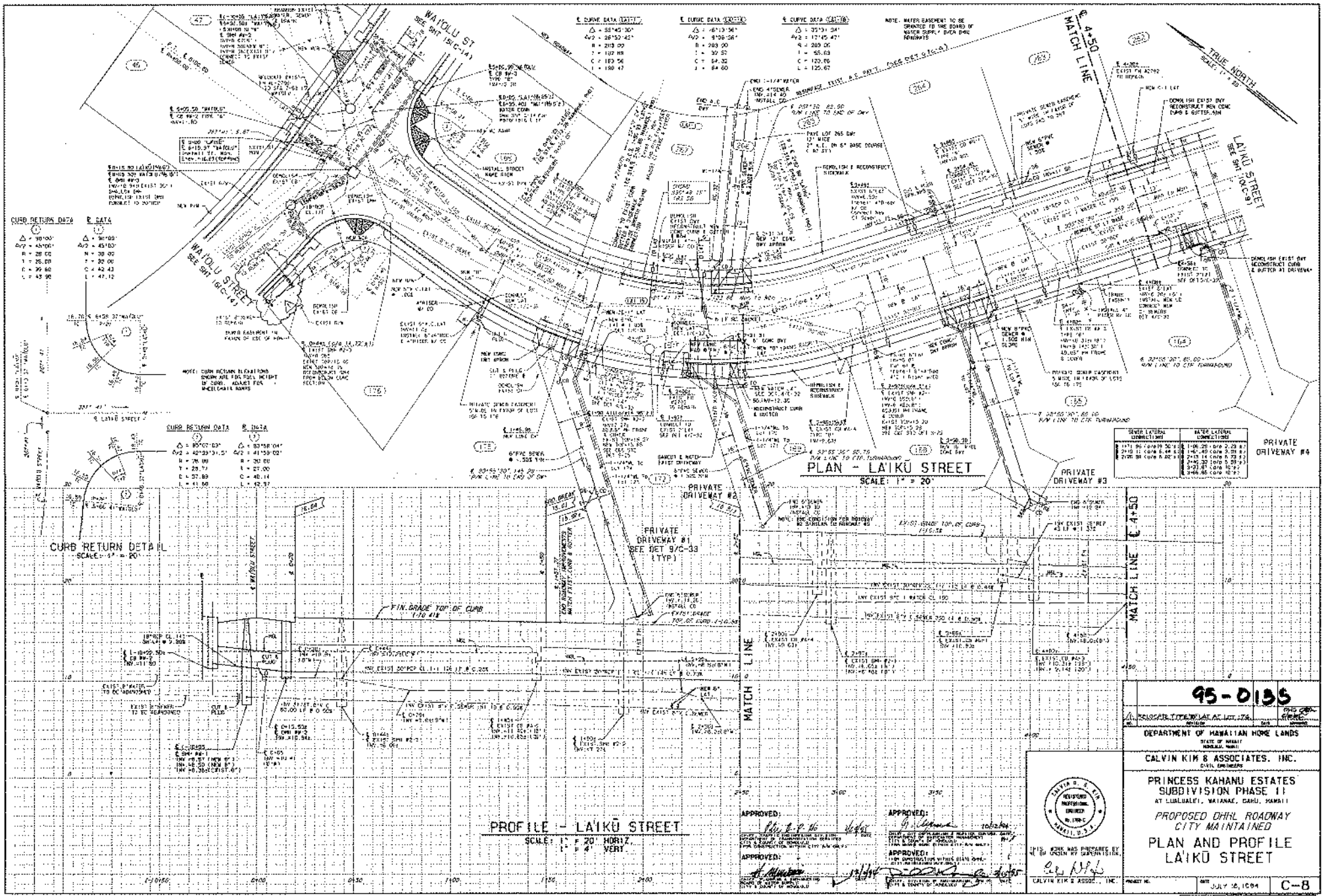
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
(POHAI STREET)
PRINCESS KAHANU AVENUE

JULY 18, 1994 — C-7

AS BUILT — SHEET 8 OF 81 SHEETS



95-015S

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
LAIKU STREET

REGISTERED PROFESSIONAL ENGINEER NO. 7886-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

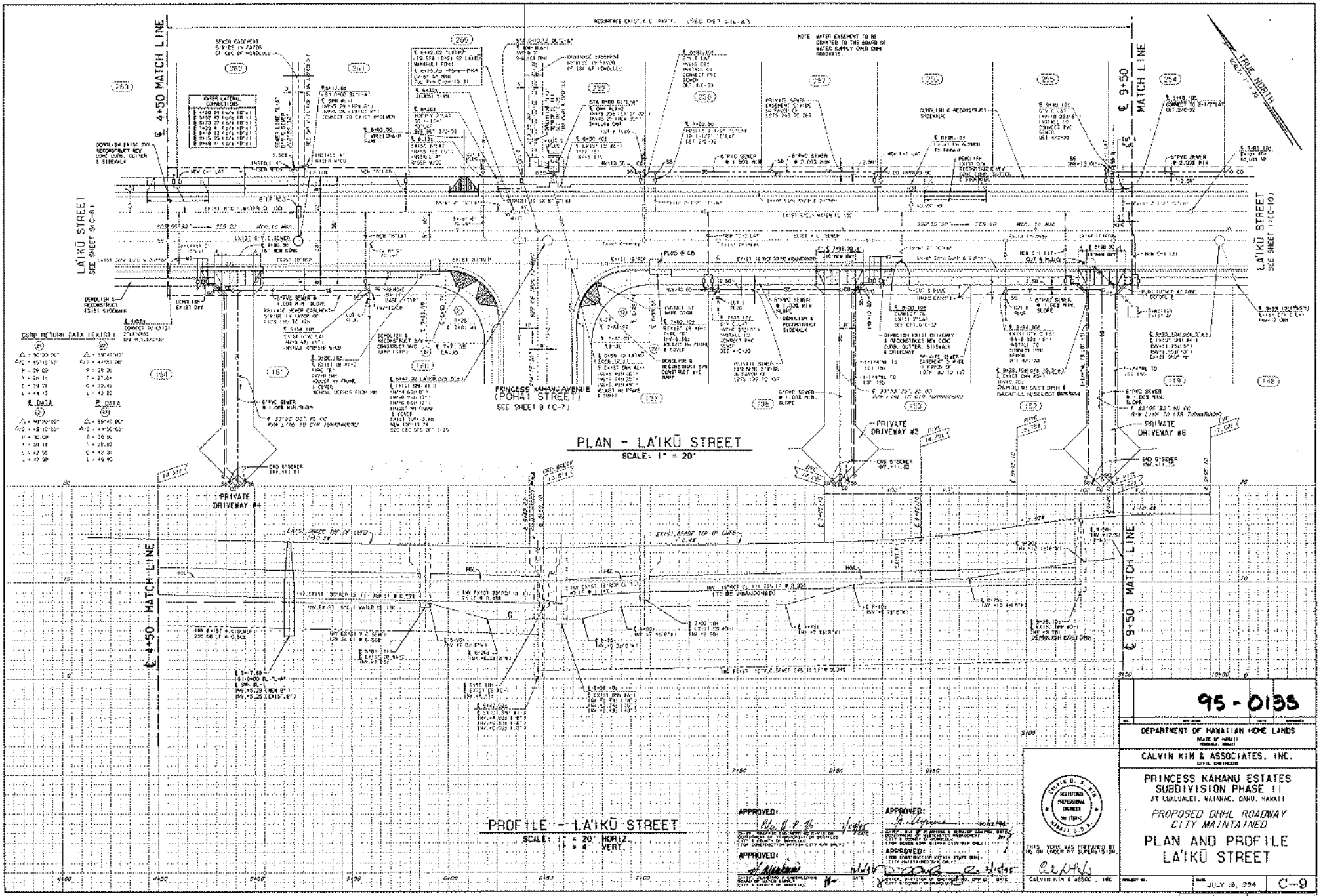
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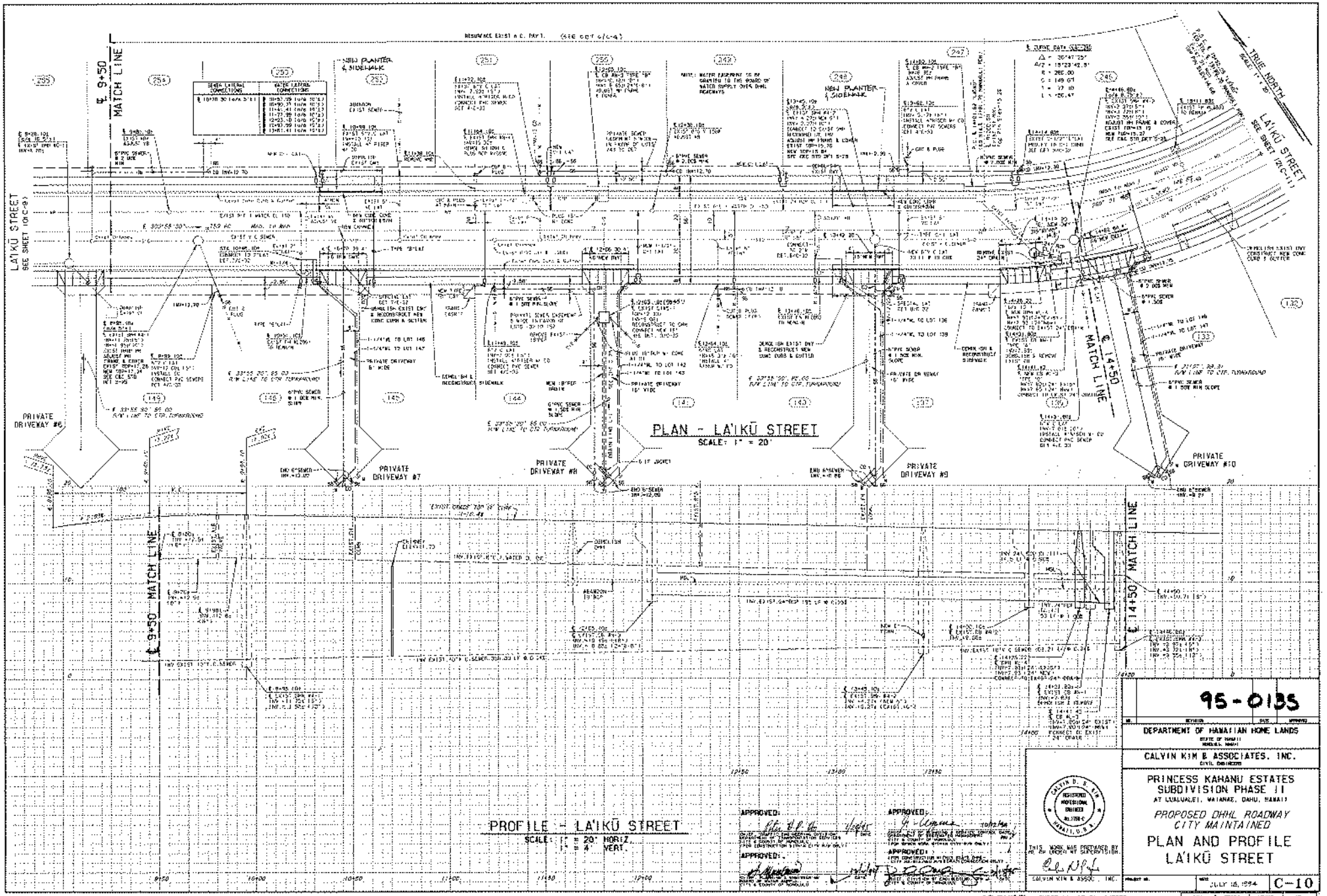
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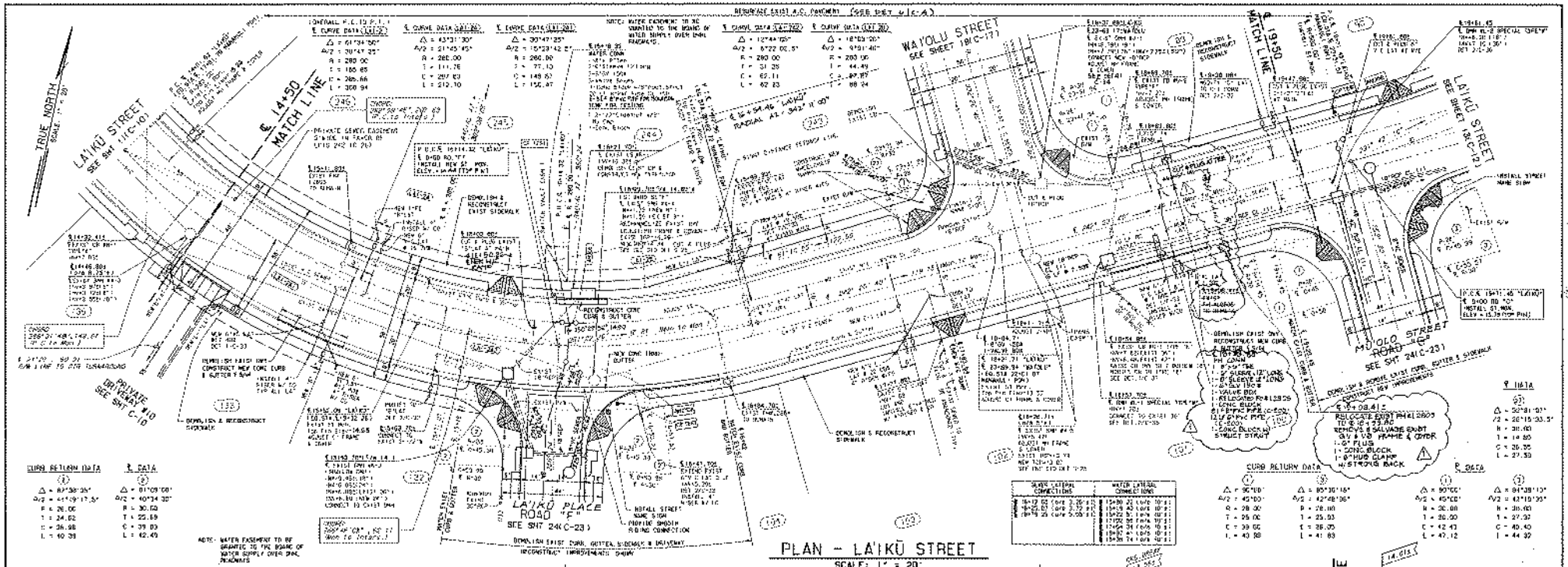
C-8

AS BUILT

SHEET 9 OF 81 SHEETS

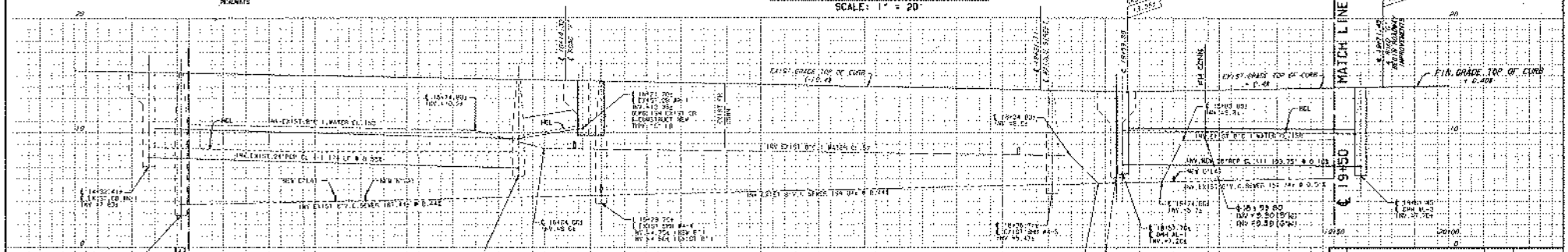

PLAN - LA'IKŪ STREET
SCALE: 1" = 20'
PROFILE - LA'IKŪ STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
PRINCESS KAHANU AVENUE (POHAI STREET)
SEE SHEET 8 (C-7)
LA'IKŪ STREET
SEE SHEET 9 (C-8)
LA'IKŪ STREET
SEE SHEET 11 (C-10)
℄ 4+50 MATCH LINE
℄ 9+50 MATCH LINE
PRIVATE DRIVEWAY #4
PRIVATE DRIVEWAY #5
PRIVATE DRIVEWAY #6
CURB RETURN DATA (EXIST.)
TRUE NORTH
95-0135
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEER
PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LEALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED
PLAN AND PROFILE
LA'IKŪ STREET
JULY 18, 1994
C-9
AS BUILT
SHEET 10 OF 61 SHEETS

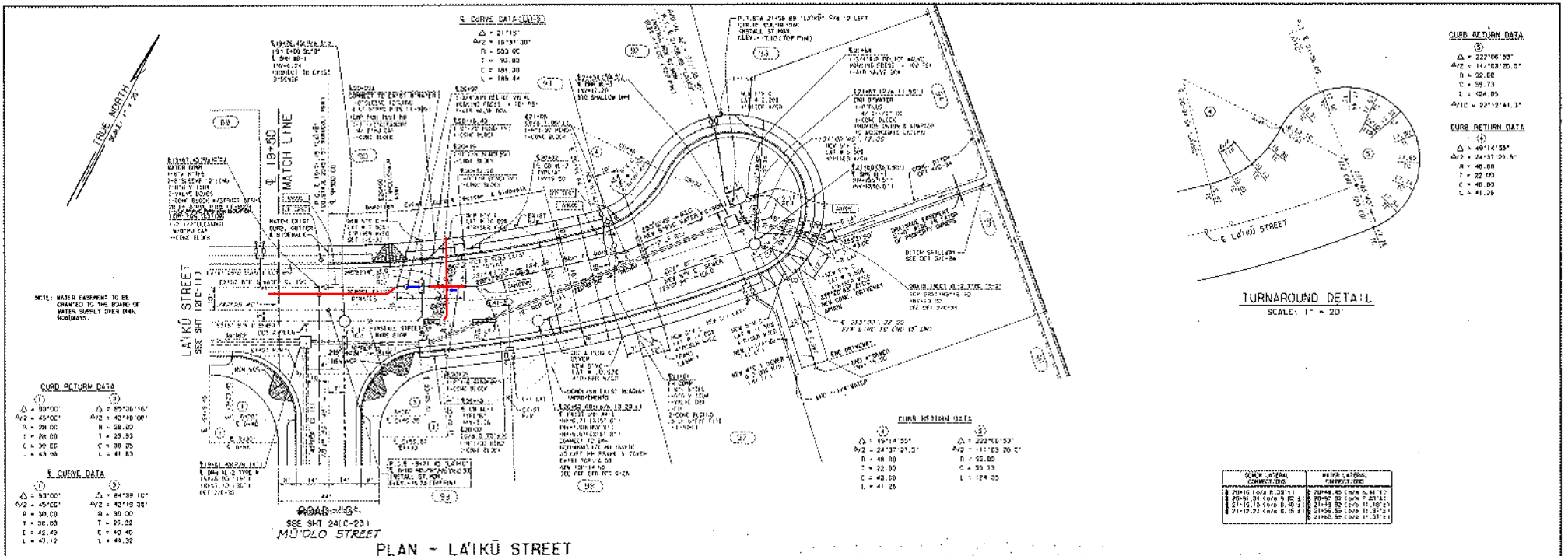

LA'IKŪ STREET
SEE SHEET 10(C-9)
℄ 9+50 MATCH LINE
℄ 14+50 MATCH LINE
TRUE NORTH
SCALE: 1" = 20'
PLAN - LA'IKŪ STREET
SCALE: 1" = 20'
PRIVATE DRIVEWAY #6
PRIVATE DRIVEWAY #7
PRIVATE DRIVEWAY #8
PRIVATE DRIVEWAY #9
PRIVATE DRIVEWAY #10
NEW PLANTER & SIDEWALK
PROFILE - LA'IKŪ STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
APPROVED:
APPROVED:
APPROVED:
APPROVED:
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN K.Y. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 7781-E
HAWAII, U.S.A.
CALVIN KIM & ASSOC., INC.
95-0135
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS
PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED
PLAN AND PROFILE
LA'IKŪ STREET
JULY 18, 1994
C-10
AS BUILT
SHEET 11 OF 81 SHEETS



PLAN - LA'IKŪ STREET

SCALE: 1" = 20'


℄ 14+50 MATCH LINE
℄ 19+50 MATCH LINE
EXIST GRADE TOP OF CURB
F.G. TOP OF CURB
EXIST GRADE TOP OF CURB
F.G. TOP OF CURB
INV. EXIST 8"V.C. SEWER 193.48± IN
INV. NEW 8" PVC SEWER 193.73± IN
INV. EXIST 8"V.C. SEWER 193.48± OUT
INV. EXIST 8"V.C. SEWER 191.48± IN
INV. EXIST 8"V.C. SEWER 191.48± OUT
INV. EXIST 8"V.C. SEWER 189.48± IN
INV. EXIST 8"V.C. SEWER 189.48± OUT
INV. EXIST 8"V.C. SEWER 187.48± IN
INV. EXIST 8"V.C. SEWER 187.48± OUT
INV. EXIST 8"V.C. SEWER 185.48± IN
INV. EXIST 8"V.C. SEWER 185.48± OUT
INV. EXIST 8"V.C. SEWER 183.48± IN
INV. EXIST 8"V.C. SEWER 183.48± OUT
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SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
1 20+16 Lt/Rt 8.29' Lt	1 20+16.45 Lt/Rt 8.41' Lt
2 20+16.34 Lt/Rt 9.15' Lt	2 20+17.02 Lt/Rt 7.83' Lt
3 21+15.35 Lt/Rt 8.48' Lt	3 21+15.85 Lt/Rt 11.18' Lt
4 21+17.21 Lt/Rt 8.15' Lt	4 21+16.55 Lt/Rt 11.31' Lt
	5 21+16.50 Lt/Rt 11.30' Lt

APPROVED:

APPROVED:

APPROVED:

APPROVED:

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

CALVIN KIM & ASSOC., INC.

95-0135

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

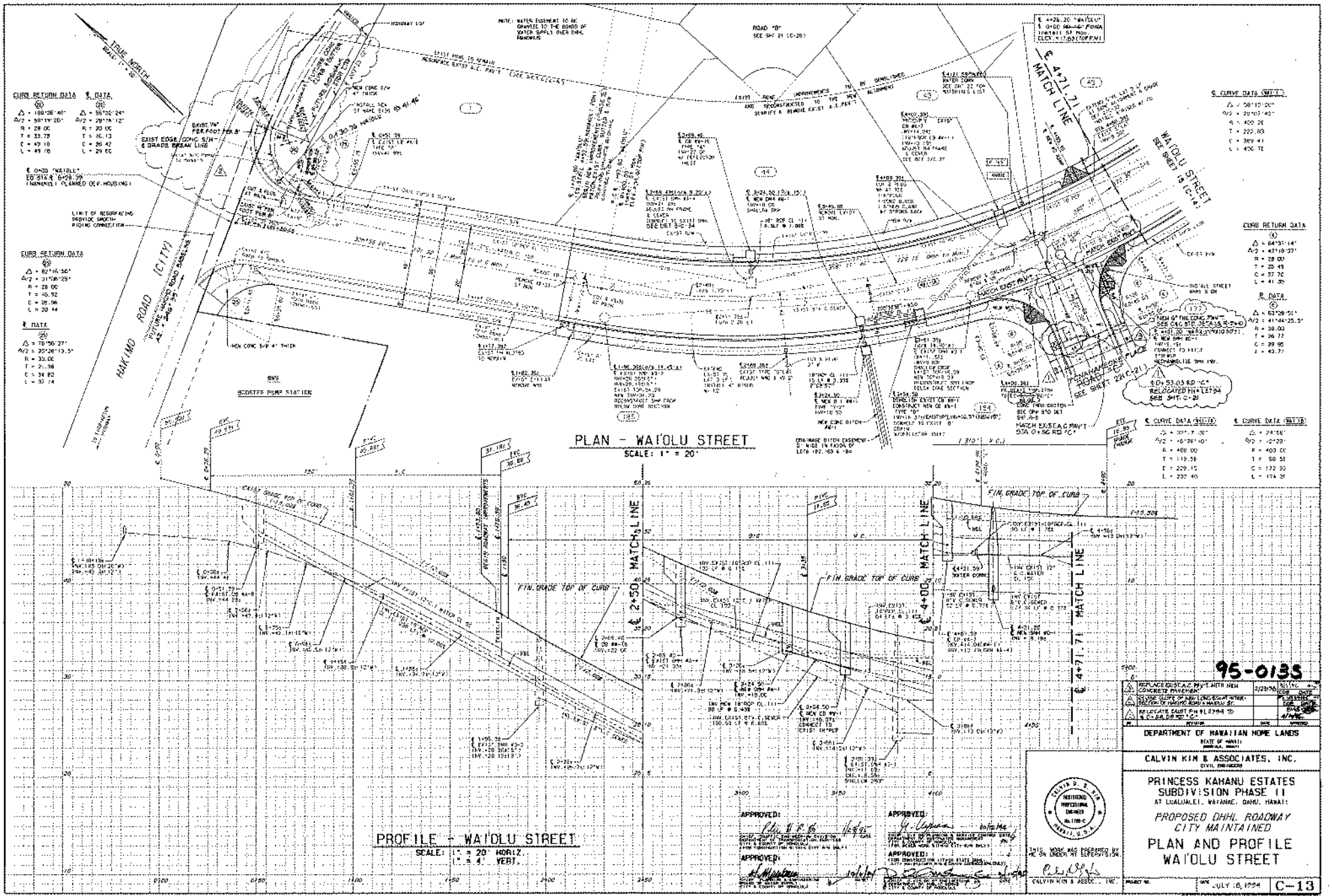
PLAN AND PROFILE
LA'IKŪ STREET

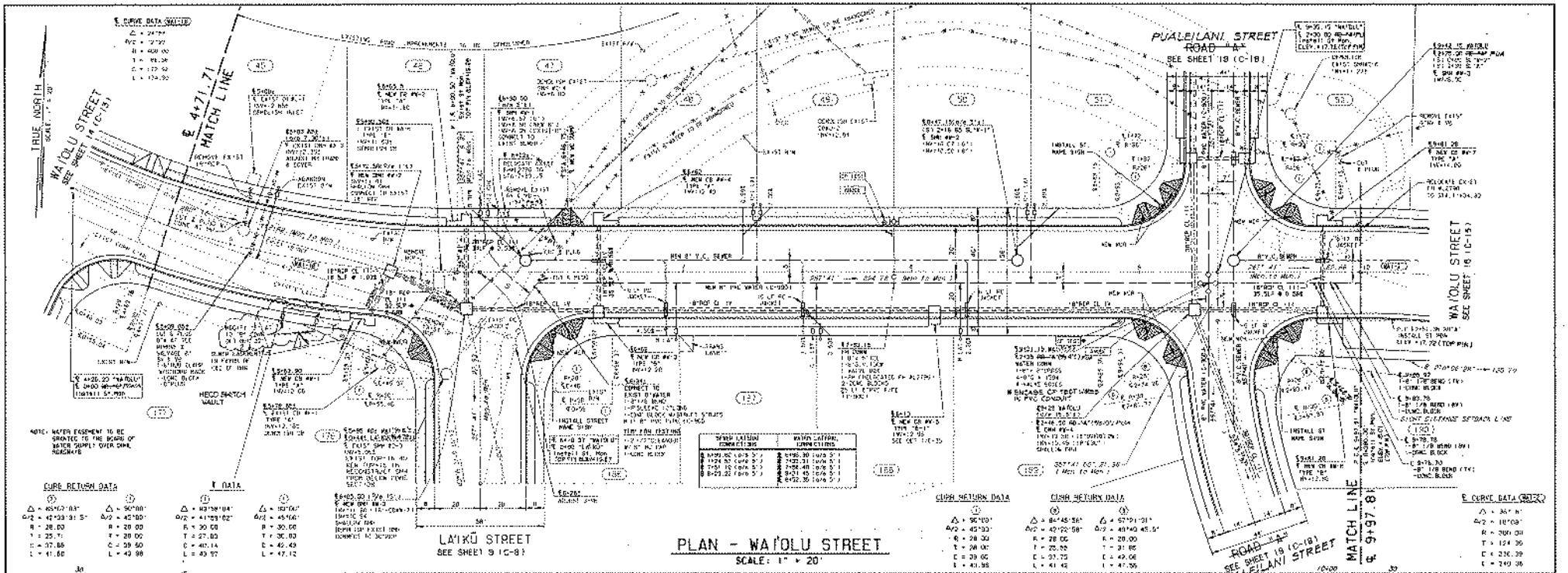
JULY 18, 1994

C-12

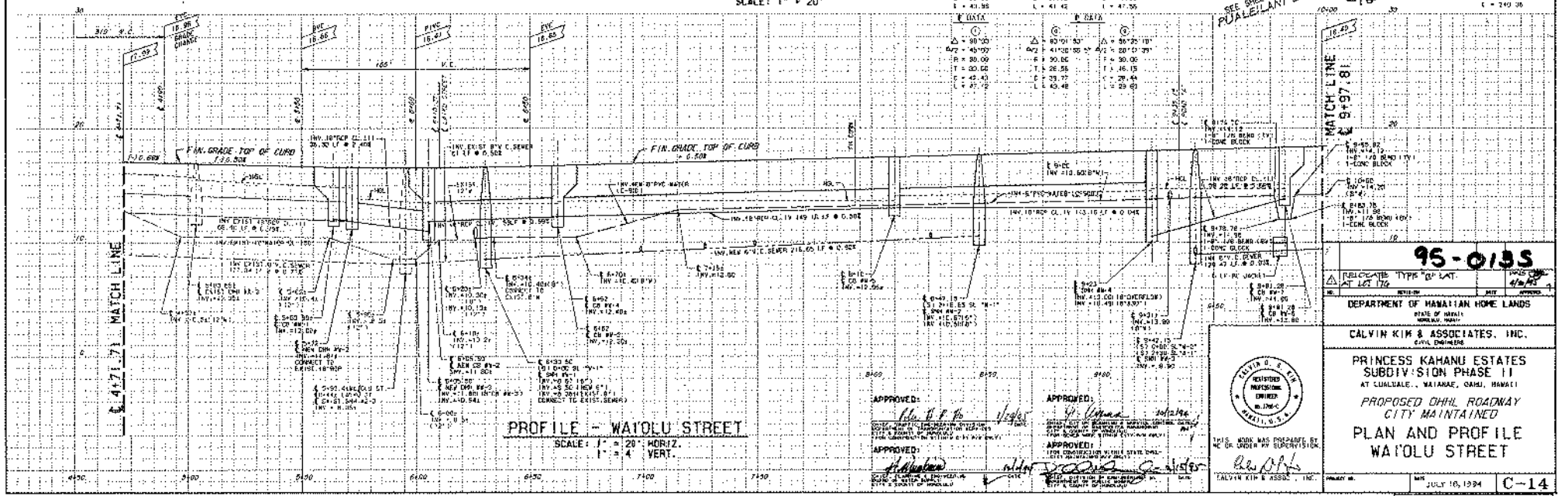
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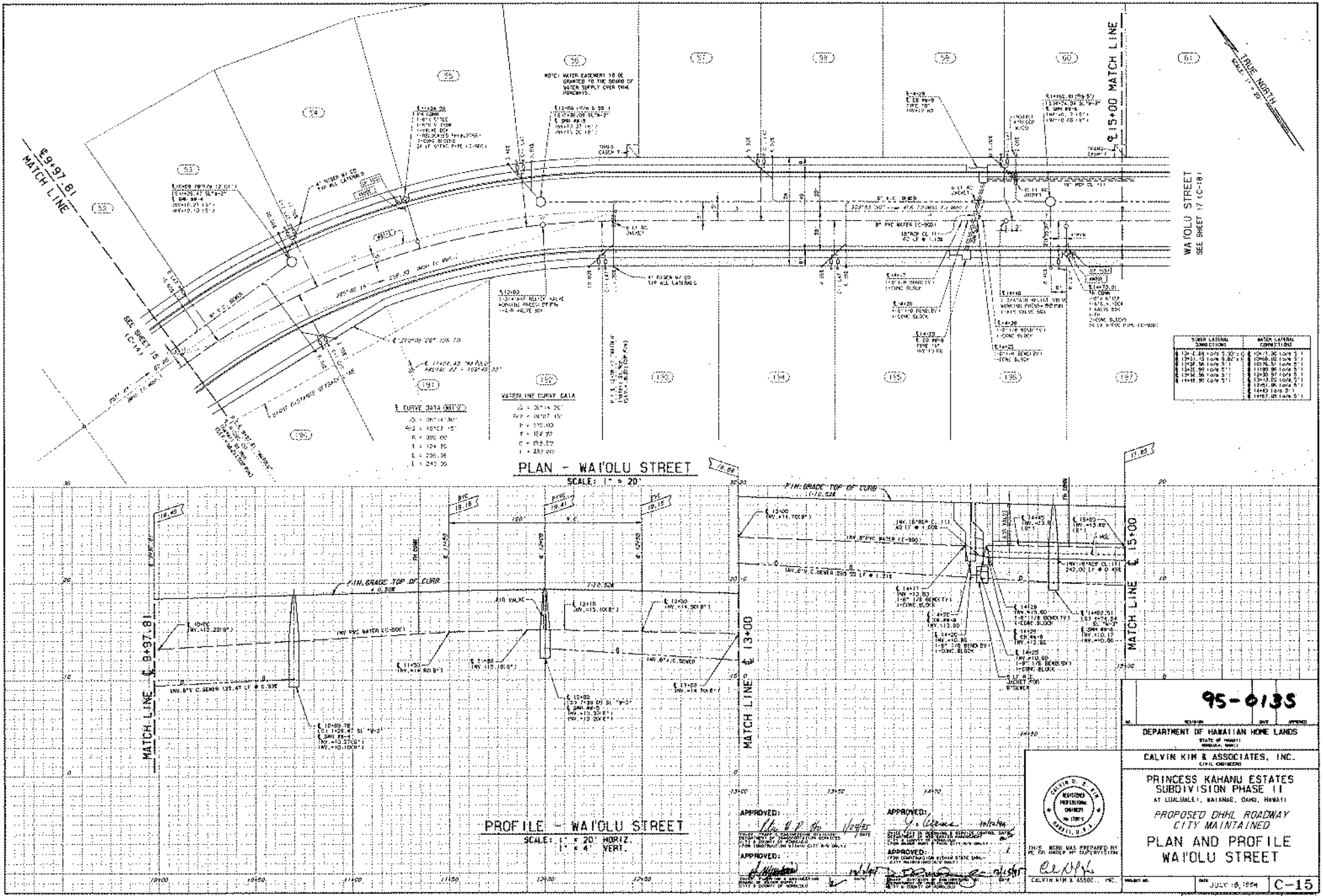
SHEET 13 OF 81 SHEETS

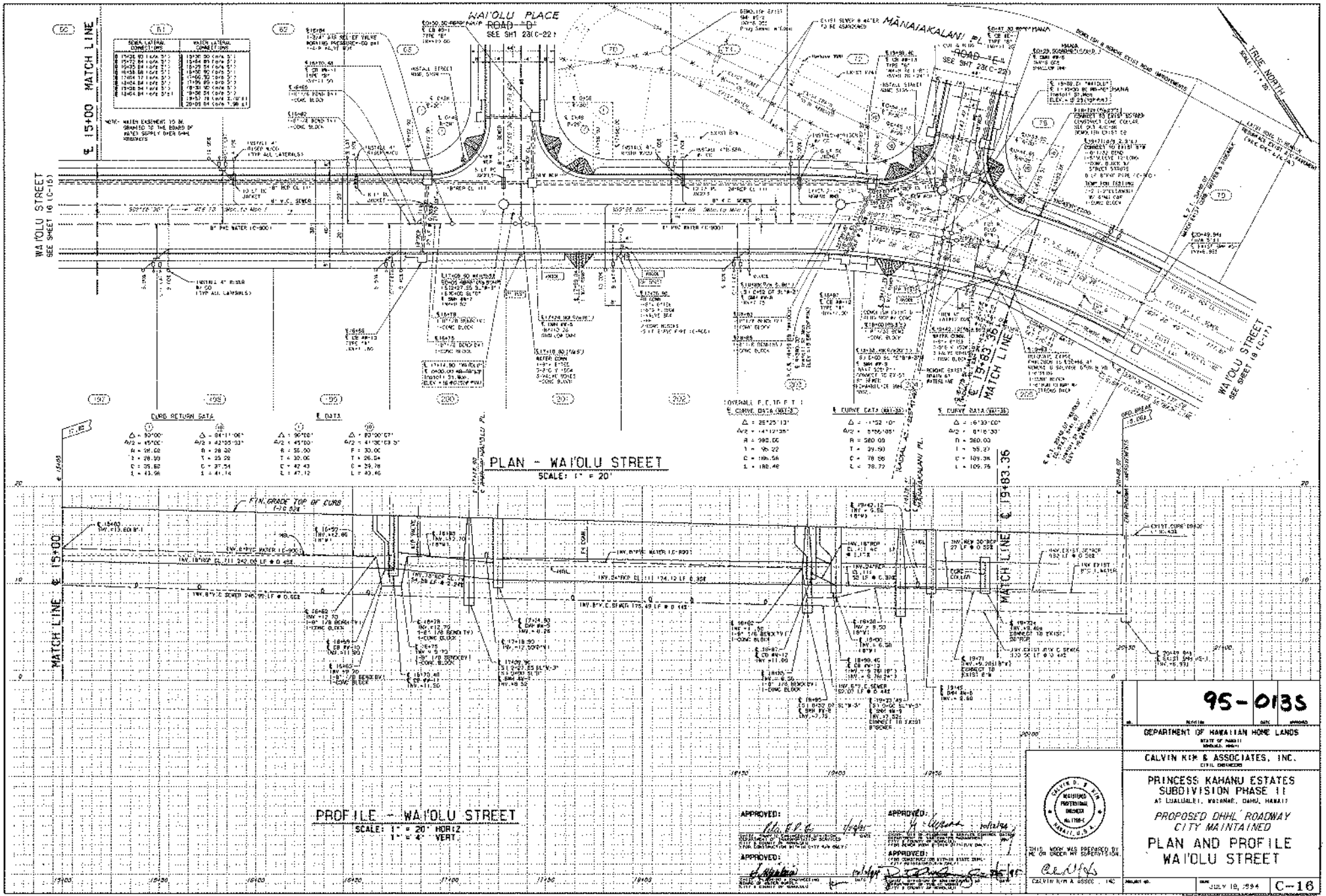

PLAN - WAIOLU STREET
SCALE: 1" = 20'
PROFILE - WAIOLU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
HAKIMO ROAD (CITY)
WAIOLU STREET
SEE SHEET 13 (C-14)
HANAKOKE PLACE
SEE SHEET 22 (C-21)
SCOTTER PUMP STATION
SMS
TRUE NORTH
SCALE: 1" = 20'
ROAD "B"
SEE SHT 21 (C-20)
EXIST. EDGE OF PAVT. & GRADE BREAK LINE
LIMIT OF RESURFACING
PROPOSED DHHL ROADWAY
CITY MAINTAINED
PLAN AND PROFILE
WAIOLU STREET
PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS
95-0135
APPROVED:
AS BUILT
SHEET 14 OF 87 SHEETS
JULY 18, 1994
C-13



PLAN - WAIOLU STREET
SCALE: 1" = 20'


℄ 4+71.71 MATCH LINE
℄ 9+97.81 MATCH LINE
F.G. GRADE CHANGE
F.G. GRADE CHANGE
F.G. GRADE CHANG


PLAN - WAI'OLU STREET
SCALE: 1" = 20'
PROFILE - WAI'OLU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
MATCH LINE ℄ 9+97.81
MATCH LINE ℄ 13+00
MATCH LINE ℄ 15+00
WAI'OLU STREET
SEE SHEET 17 (C-18)
SEE SHEET 15 (C-14)
TRUE NORTH
SCALE: 1" = 20'
WATERLINE CURVE DATA
℄ CURVE DATA (NEW)
8" PVC WATER (C-900)
8" P.V.C. SEWER
8" DIP WATER (C-900)
FIN. GRADE TOP OF CURB
FIN. GRADE TOP OF CURB
AIR VALVE
4" RISER W/ CO TYP ALL LATERALS
SEWER LATERAL CONNECTIONS
WATER LATERAL CONNECTIONS
95-0135
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS
PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED
PLAN AND PROFILE
WAI'OLU STREET
APPROVED:
APPROVED:
APPROVED:
APPROVED:
REGISTERED PROFESSIONAL ENGINEER
No. 7785-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
CALVIN KIM & ASSOC., INC.
JULY 18, 1994
C-15
AS BUILT
SHEET 16 OF 81 SHEETS



95-0135

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
WAIOLU STREET

REGISTERED PROFESSIONAL ENGINEER No. 7769-C
CALVIN D. K. KIM
HAWAII, U.S.A.

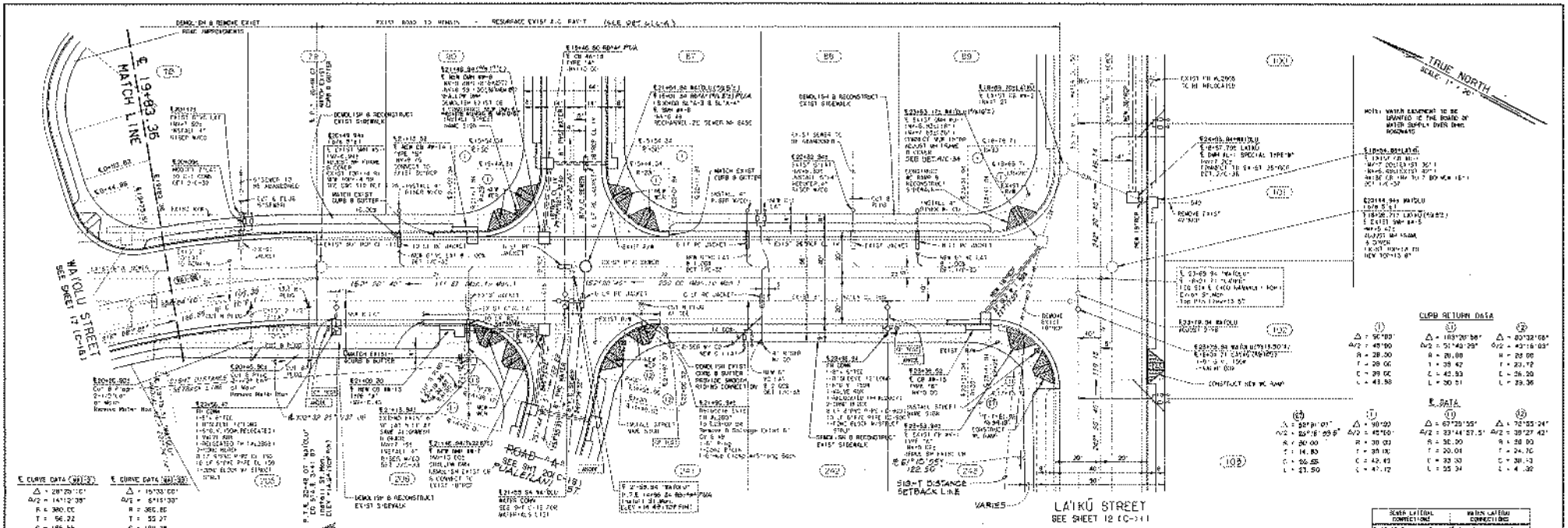
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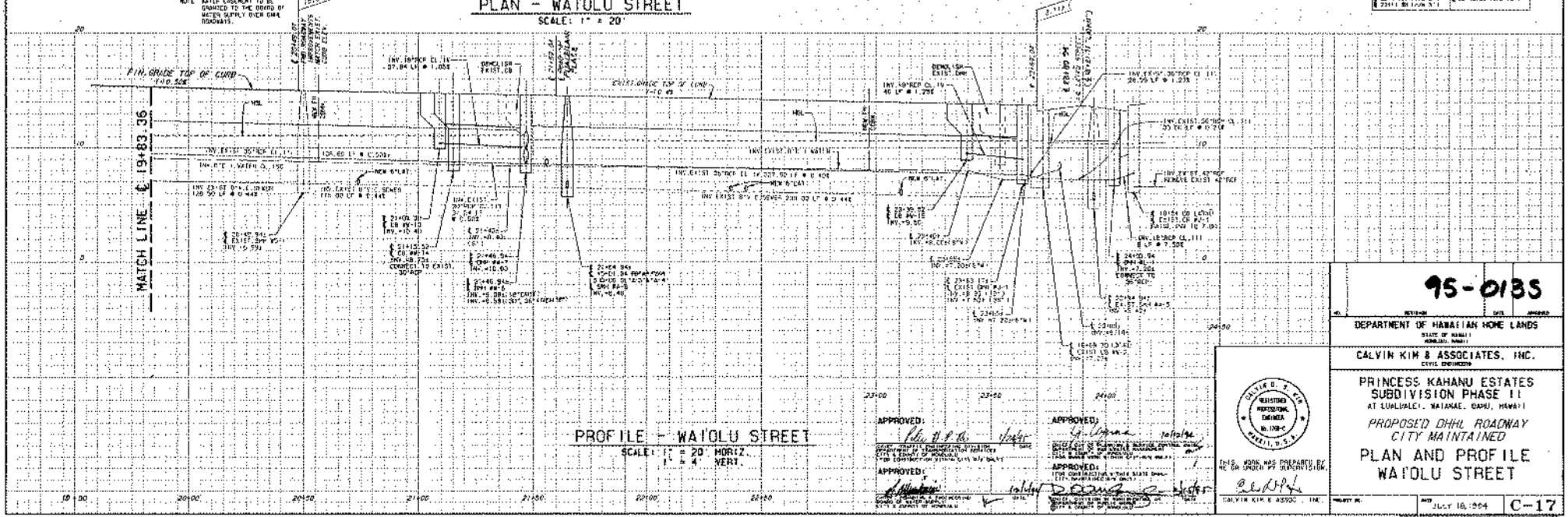
CALVIN KIM & ASSOC., INC.

JULY 19, 1994

C-16

SHEET 17 OF 81 SHEETS





95-0185

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
WAIOLU STREET

APPROVED:
CITY & COUNTY OF HONOLULU

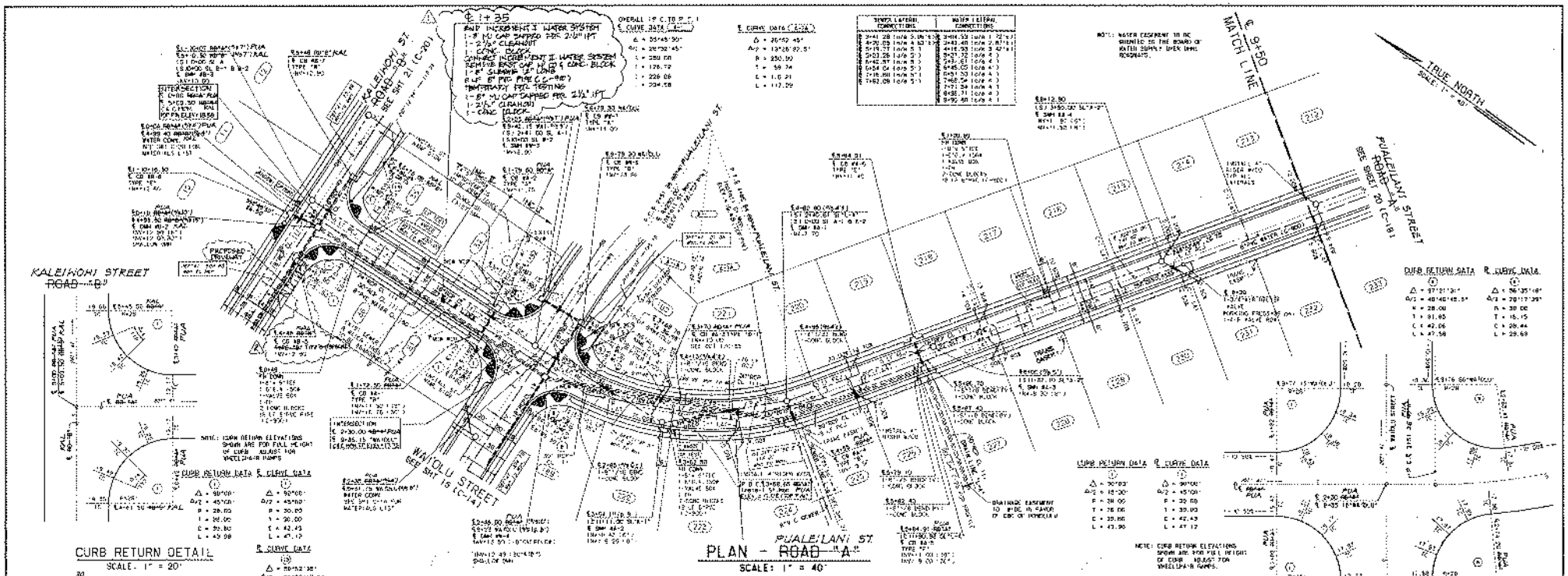
APPROVED:
DEPARTMENT OF HAWAIIAN HOME LANDS

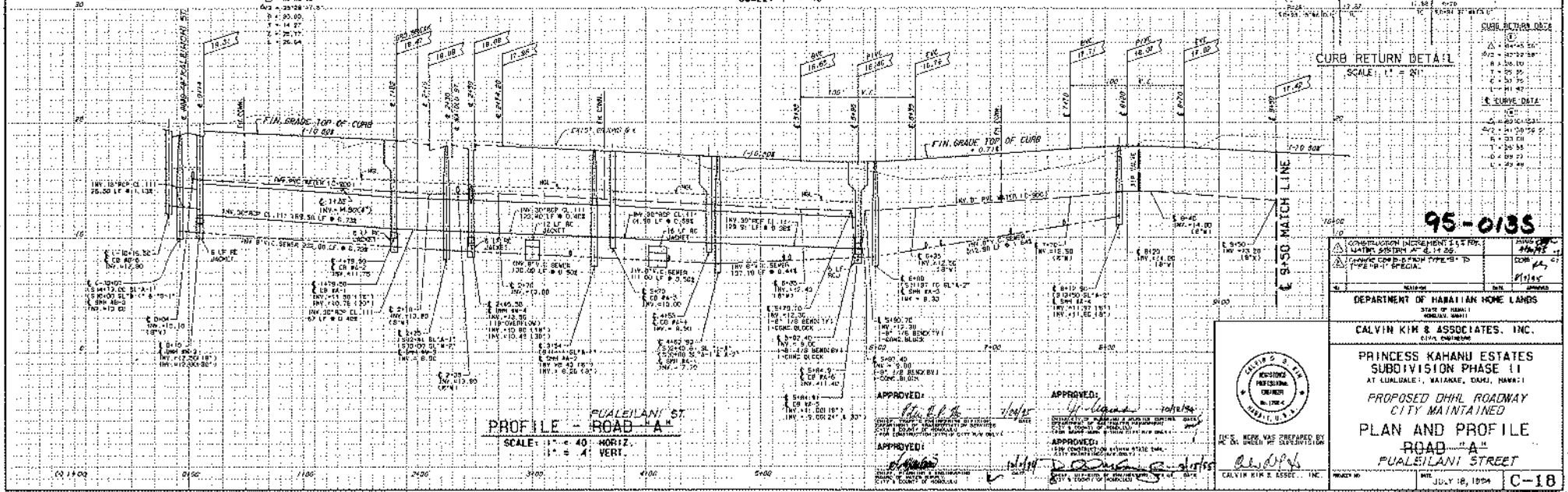
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CALVIN KIM & ASSOC., INC.

JULY 16, 1964

C-17

AS BUILT SHEET 18 OF 61 SHEETS





95-0135

CONSTRUCTION INCREMENT 2 & 3 FOR WATER SYSTEM AT ℄ 14.250

CURB COMB-D-8"INCH TYPE "B" TO TYPE "B-1" SPECIAL

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
ROAD "A"
PUALEILANI STREET

REGISTERED PROFESSIONAL ENGINEER
CALVIN S. KIM
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

CALVIN KIM & ASSOC., INC.

APPROVED:
DIRECTOR OF TRANSPORTATION SERVICES
FOR CONSTRUCTION WITHIN CITY R/W ONLY
DATE 10/6/95

APPROVED:
CHIEF ENGINEER
DEPARTMENT OF HAWAIIAN HOME LANDS
DATE 10/16/95

APPROVED:
DIRECTOR OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU
DATE 10/16/95

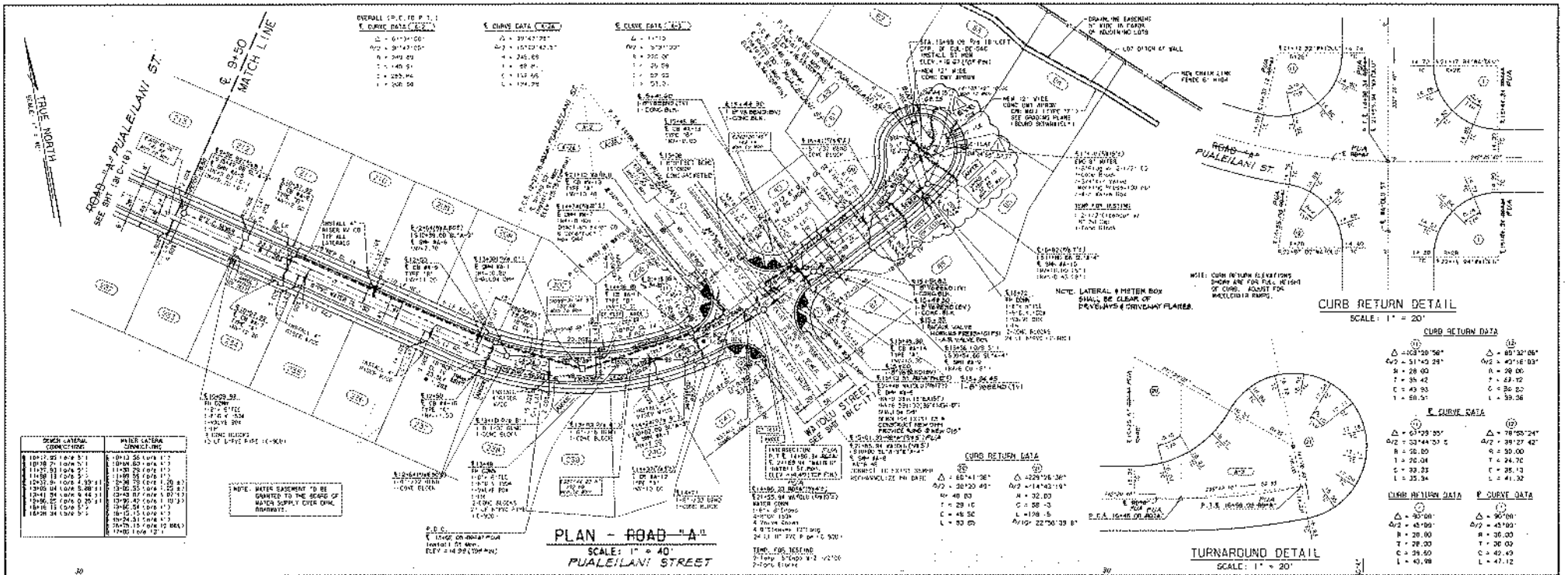
APPROVED:
CHIEF ENGINEER
DEPARTMENT OF HEALTH
STATE OF HAWAII
DATE 10/16/95

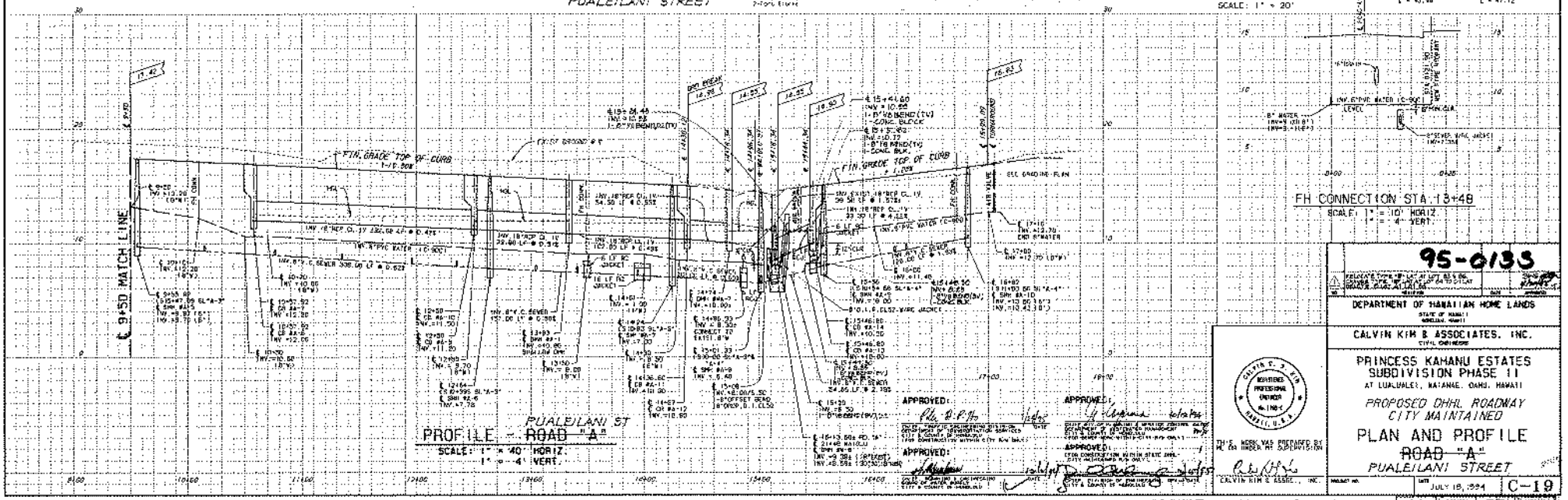
JULY 18, 1994

C-18

AS BUILT

SHEET 19 OF 81 SHEETS





95-0133

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
ROAD "A"
PUALEILANI STREET

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CALVIN K. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 7809
HAWAII, U.S.A.

CALVIN KIM & ASSOC., INC.

APPROVED:
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

APPROVED:
CITY & COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

APPROVED:
FOR CONSTRUCTION WITHIN STATE R/W

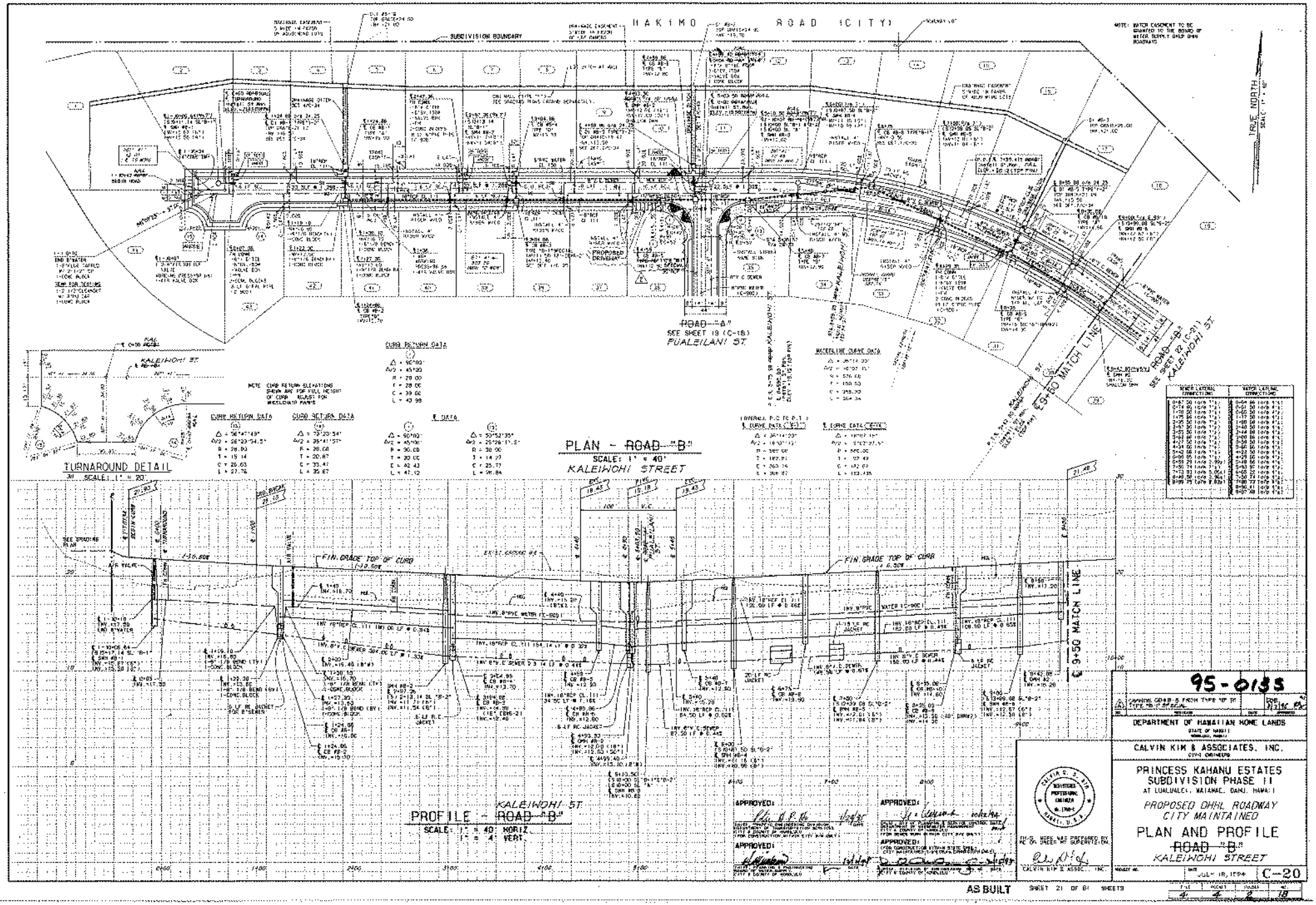
APPROVED:
FOR CONSTRUCTION WITHIN CITY R/W

JULY 18, 1994

C-19

AS BUILT

SHEET 20 OF 61 SHEETS



95-0135

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED OHHL ROADWAY
CITY MAINTAINED

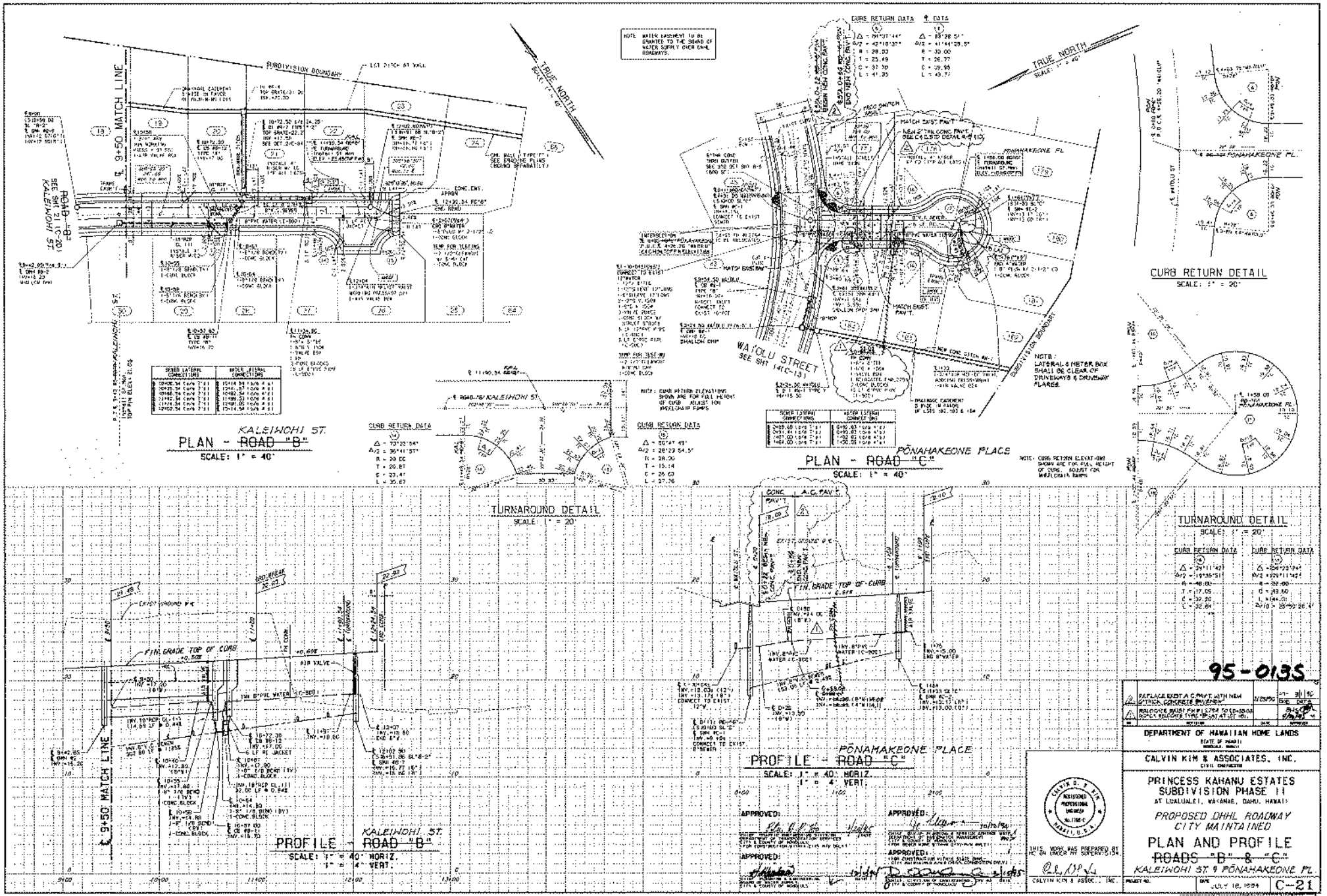
PLAN AND PROFILE
ROAD "B"
KALEIWOHI STREET

JULY 18, 1994

C-20

AS BUILT

SHEET 21 OF 81 SHEETS



95-013S

2	REPLACE EXIST A.C.PAVT. WITH NEW CONCRETE PAVEMENT	11/05/96	BHS
1	RELOCATE WATER METER LSTM TO C-13-04 & C-14 RELOCATE TYPE "B" LAT AT ST. (C-16)	10/30/96	BHS
NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LOALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY CITY MAINTAINED

PLAN AND PROFILE

~~ROADS "B" & "C"~~

KALEIHOHI ST. & PŌNAHAKEONE PL.

APPROVED:

APPROVED:

APPROVED:

APPROVED:

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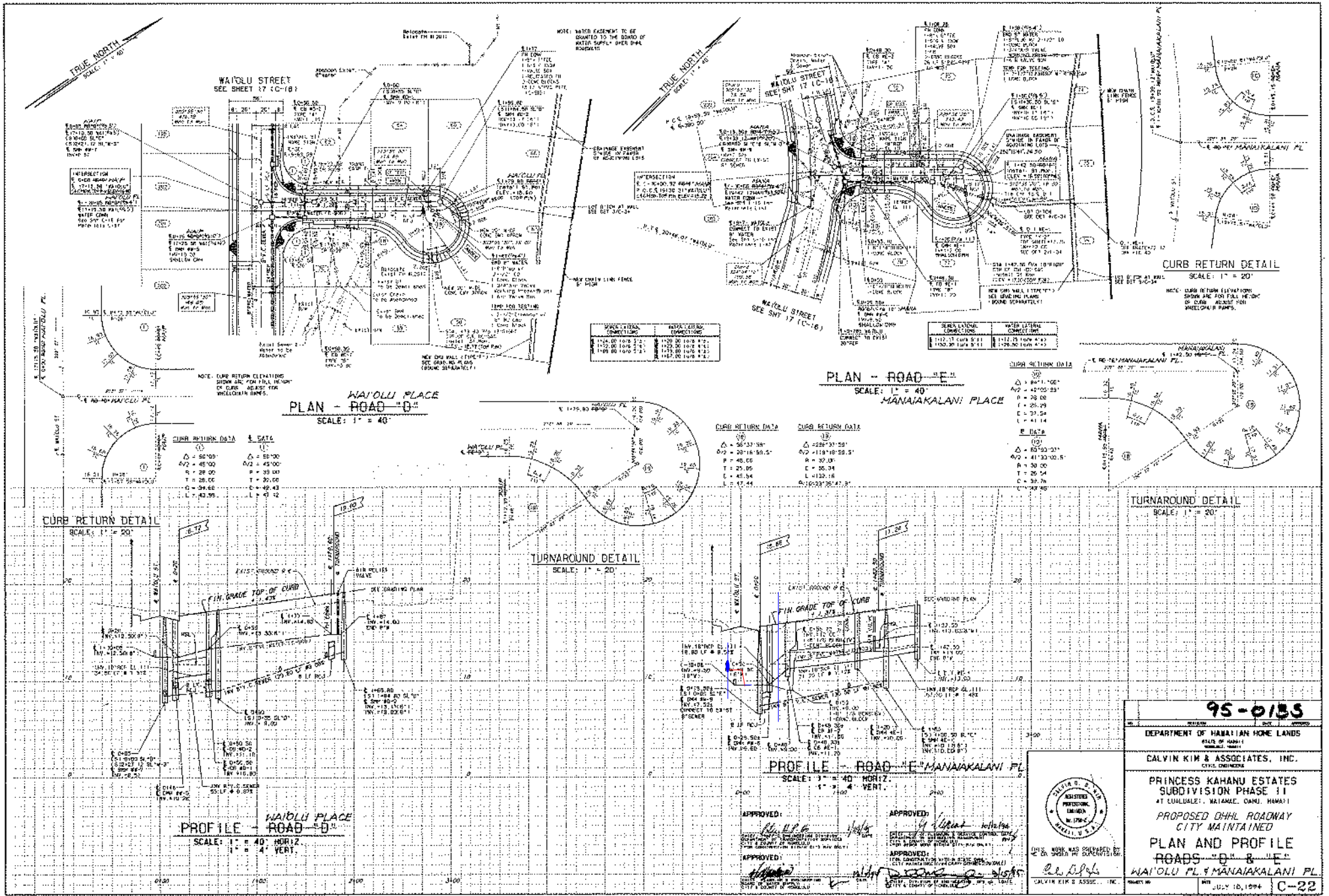
CALVIN KIM & ASSOC., INC.

JULY 16, 1994

C-21

AS BUILT

SHEET 22 OF 81 SHEETS



95-0185

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED OHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
~~ROADS "D" & "E"~~
WAIOLU PL. & MANAIAKALANI PL.

REGISTERED PROFESSIONAL ENGINEER No. 7796-C
CALVIN O. S. KIM
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

APPROVED:
DIRECTOR OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT, CITY & COUNTY OF HONOLULU
DATE 10/12/94

APPROVED:
DIRECTOR OF DEPARTMENT OF HAWAIIAN HOME LANDS
DATE

APPROVED:
CHIEF ENGINEER, DEPARTMENT OF WATER SUPPLY, CITY & COUNTY OF HONOLULU
DATE

APPROVED:
CITY CONSTRUCTION INSPECTOR (CHIEF ENGINEER)
DATE

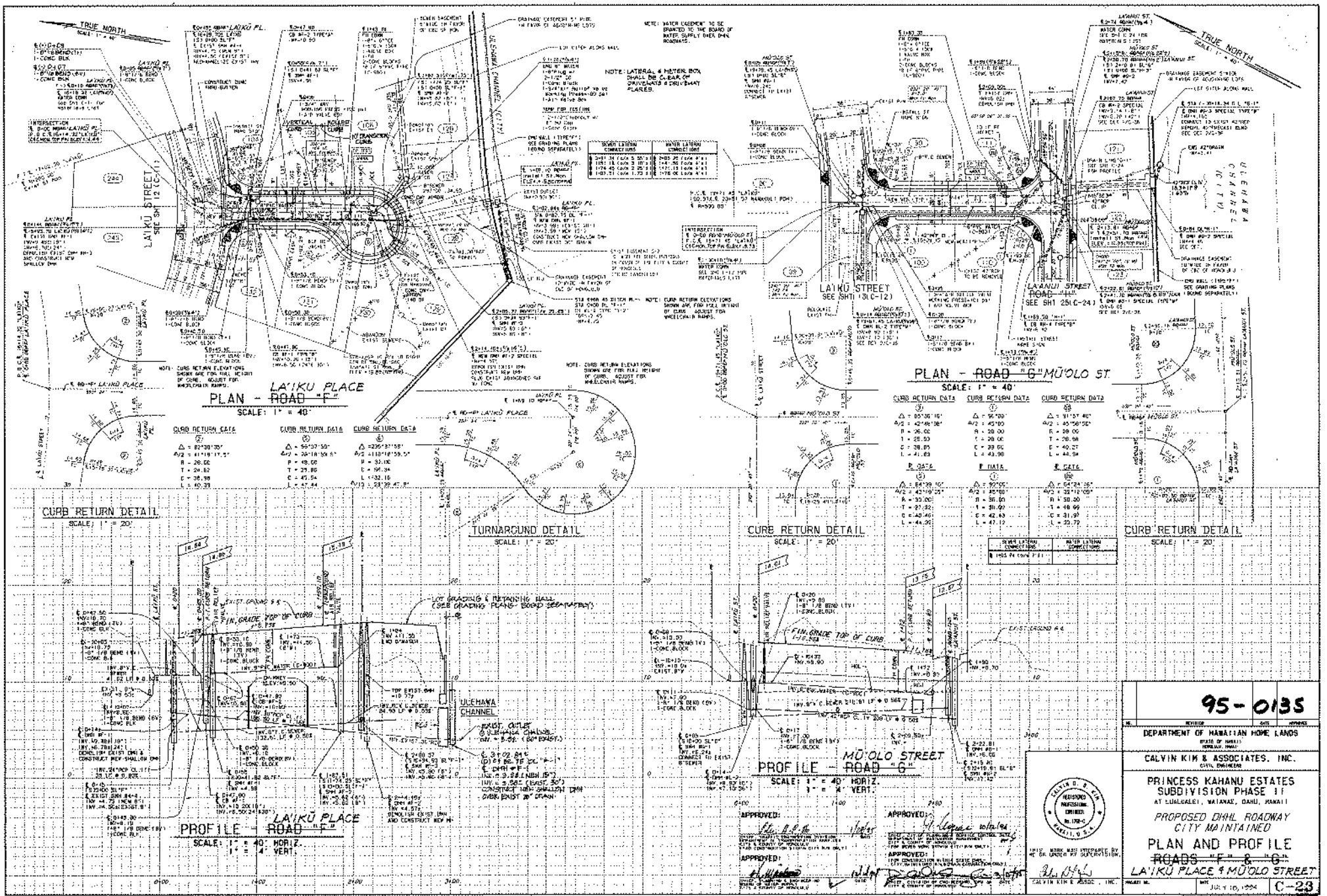
DATE JULY 15, 1994

C-22

AS BUILT

SHEET 23 OF 81 SHEETS

FILE 2 4 2 20



95-0135

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
~~ROADS "F" & "G"~~
LA'IKU PLACE & MU'OLO STREET

REGISTERED PROFESSIONAL ENGINEER No. 7768-C CALVIN D. K. KIM HAWAII, U.S.A.

THIS MAP WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

APPROVED:
DIRECTOR OF HAWAIIAN HOME LANDS

APPROVED:
DIRECTOR OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

APPROVED:
DIRECTOR OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU

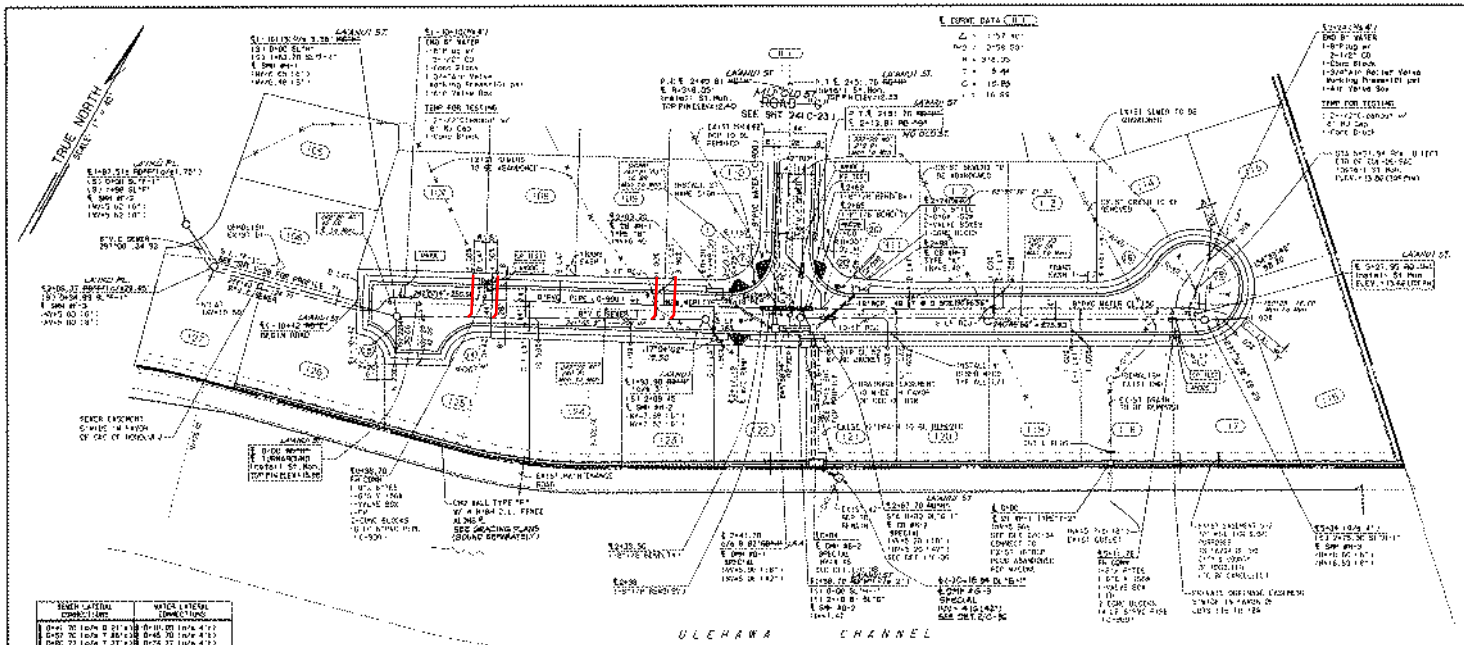
APPROVED:
CHIEF ENGINEER
DEPARTMENT OF HAWAIIAN HOME LANDS

DATE: JULY 10, 1994

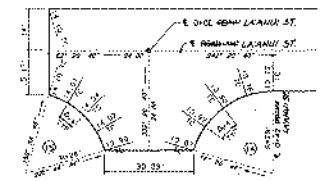
C-23

AS BUILT

SHEET 24 OF 61 SHEETS



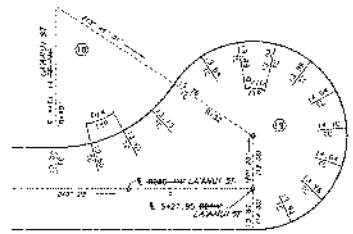
LA'ANUI STREET
PLAN - ROAD "H"
SCALE: 1" = 40'



TURNAROUND DETAIL
SCALE: 1" = 20'

CURB RETURN DATA (15)
Δ = 56°41'49"
Δ/2 = 28°20'54.5"
R = 28.00
T = 15.14
C = 26.63
L = 27.76

CURB RETURN DATA (14)
Δ = 73°29'54"
Δ/2 = 36°44'57"
R = 28.00
T = 20.87
C = 33.42
L = 35.87



TURNAROUND DETAIL
SCALE: 1" = 20'

CURB RETURN DATA (18)
Δ = 56°39'59"
Δ/2 = 28°19'59.5"
R = 48.00
T = 25.62
C = 45.64
L = 47.44

CURB RETURN DATA (19)
Δ = 236°39'59"
Δ/2 = 118°19'59.5"
R = 32.00
C = 56.34
L = 132.16
Δ/10 = 23°39'47.9"

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
0+41.70 (6.0" D.I.P.) @ 21° (LT)	0+11.00 (1.0" IRR.) @ 4'(LT)
0+53.70 (6.0" D.I.P.) @ 90° (LT)	0+45.70 (1.0" IRR.) @ 4'(LT)
0+80.73 (6.0" D.I.P.) @ 90° (LT)	0+74.73 (1.0" IRR.) @ 4'(LT)
1+43.31 (6.0" D.I.P.) @ 21° (LT)	0+96.30 (1.0" IRR.) @ 4'(LT)
1+54.31 (6.0" D.I.P.) @ 21° (LT)	1+08.30 (1.0" IRR.) @ 4'(LT)
1+93.95 (6.0" D.I.P.) @ 21° (LT)	2+24.65 (1.0" IRR.) @ 4'(LT)
2+19.81 (6.0" D.I.P.) @ 21° (LT)	2+35.51 (1.0" IRR.) @ 4'(LT)
3+43.43 (6.0" D.I.P.) @ 21° (LT)	3+54.33 (1.0" IRR.) @ 4'(LT)
4+31.81 (6.0" D.I.P.) @ 21° (LT)	4+42.71 (1.0" IRR.) @ 4'(LT)
4+94.80 (6.0" D.I.P.) @ 21° (LT)	5+05.70 (1.0" IRR.) @ 4'(LT)

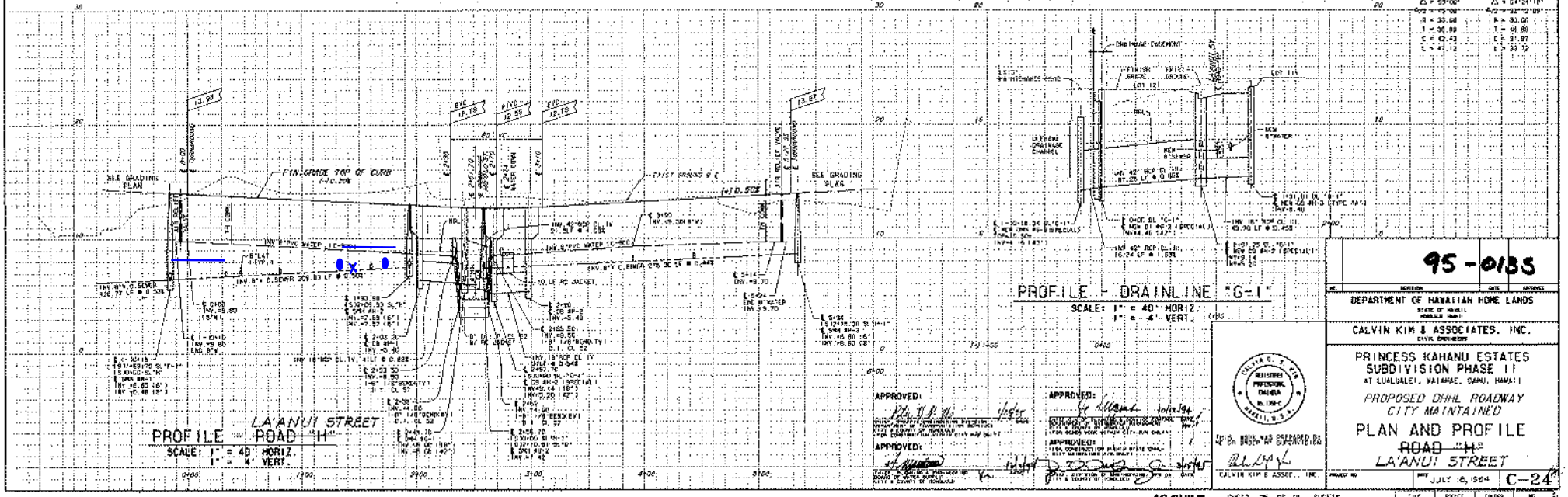
NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS

CURB RETURN DATA (1) / (20)

(1)	(20)
Δ = 90°00'	Δ = 91°52'49"
Δ/2 = 45°00'	Δ/2 = 45°56'25"
R = 28.00	R = 28.00
T = 28.00	T = 29.36
C = 39.60	C = 40.25
L = 43.98	L = 44.94

R DATA

(1)	(20)
Δ = 90°00'	Δ = 91°24'18"
Δ/2 = 45°00'	Δ/2 = 45°42'09"
R = 30.00	R = 30.00
T = 30.00	T = 28.89
C = 42.43	C = 31.97
L = 47.12	L = 33.19



LA'ANUI STREET
PROFILE - ROAD "H"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

PROFILE - DRAINLINE "G-1"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

95-0185

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
~~ROAD "H"~~
LA'ANUI STREET

APPROVED:
DIRECTOR OF DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

APPROVED:
DIRECTOR OF DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU

APPROVED:
DIRECTOR OF DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

APPROVED:
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

REGISTERED PROFESSIONAL ENGINEER No. 7369-C HAWAII, U.S.A.

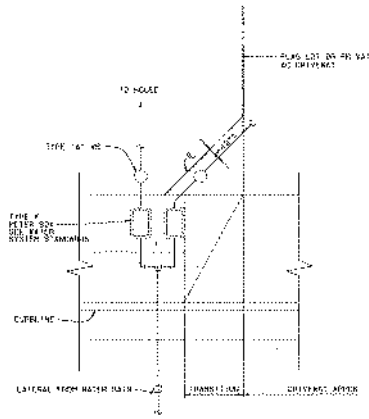
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
CALVIN KIM & ASSOC., INC.

PROJECT NO. | DATE JULY 18, 1994 | C-24

FILE | POCKET | FOLDER | NO.

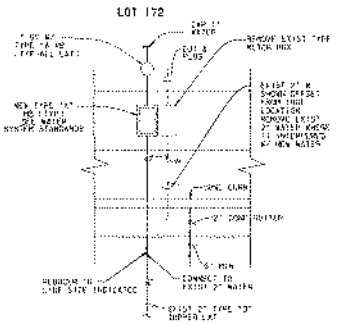
AS BUILT

SHEET 25 OF 81 SHEETS



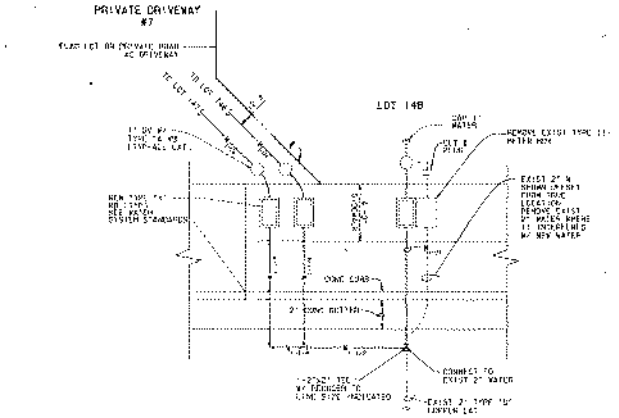
1 C-32 TYP METER BOX LOCATION @ FLAG LOTS

SCALE: 1/4"=1'-0"



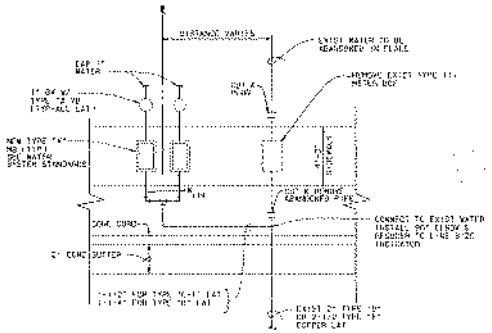
4 C-32 WATER SERVICE CONNECTION AT ℄ 1+97± LA'IKŪ ST.

NOT TO SCALE



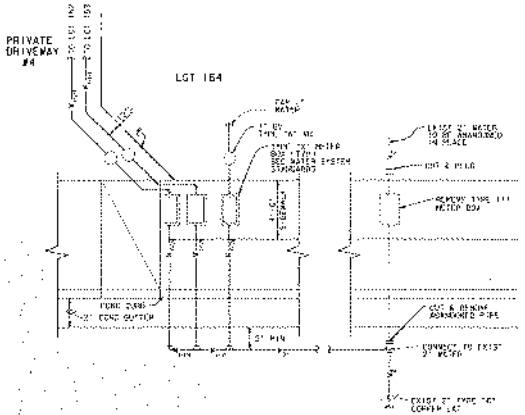
7 C-32 WATER SERVICE CONNECTION AT ℄ 10+48± LA'IKŪ ST.

NOT TO SCALE



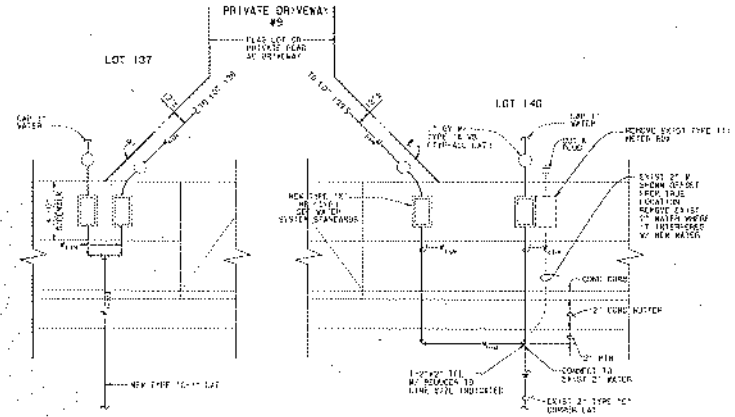
2 C-32 TYP RELOCATION & MODIFICATION OF EXIST LATERAL

SCALE: 1/4"=1'-0"



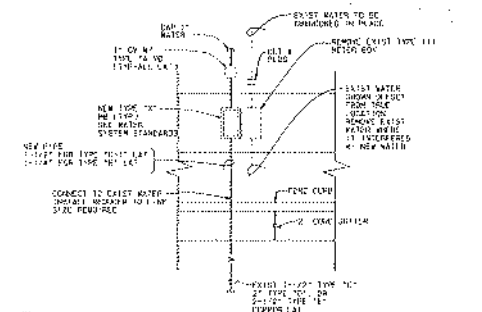
5 C-32 WATER SERVICE CONNECTION AT ℄ 4+56± LA'IKŪ ST.

NOT TO SCALE



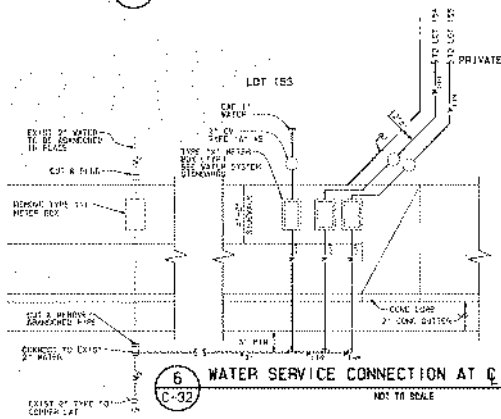
8 C-32 WATER SERVICE CONNECTION AT ℄ 13+13± LA'IKŪ ST.

NOT TO SCALE



3 C-32 TYPICAL MODIFICATION OF EXIST WATER LATERAL

SCALE: 1/4"=1'-0"



6 C-32 WATER SERVICE CONNECTION AT ℄ 8+30± LA'IKŪ ST.

NOT TO SCALE

96-0135

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

WATER DETAILS

APPROVED:

DIRECTOR OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

CHIEF ENGINEER
DEPARTMENT OF HAWAIIAN HOME LANDS

CALVIN O. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 7846-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

PROJECT NO. | DATE: JULY 18, 1994 | C-32

AS BUILT

SHEET 39 OF 81 SHEETS

CORROSION PROTECTION INSTALLATION NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991 AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.

2. ALL PIPE JOINTS, VALVES, FITTINGS, AND OTHER SPECIALS WHICH ARE NOT FACTORY TAPE COATED SHALL BE FIELD TAPE-WRAPPED USING A THREE LAYER TAPE SYSTEM PER AWWA C209-84. FIELD APPLIED BONDED TAPE COATING SHALL BE MADE JUST PRIOR TO BACKFILLING, USING A THREE LAYER COLD APPLIED BONDED TAPE COAT SYSTEM WITH A 50 PERCENT OVERLAP FOR A MINIMUM THICKNESS OF 45 MILS. THE FIELD APPLIED BONDED TAPE COATING SYSTEM SHALL OVERLAP THE FACTORY APPLIED TAPE COATING A MINIMUM OF 6 INCHES IN ALL PLACES. THE MANUFACTURER FOR THE FIELD APPLIED TAPE AND FOR THE FACTORY APPLIED TAPE COATING SHALL BE THE SAME FOR COMPATIBILITY REASONS. SEE BWS STANDARDS, VOL 3, PART 3, PARAGRAPHS 1.5 1.2 AND 1.2 1 3.

3. FIELD APPLIED TAPE COATINGS SHALL BE HOLIDAY INSPECTED JUST PRIOR TO BACKFILLING USING A HIGH VOLTAGE PIPE COATING HOLIDAY DETECTOR IN ACCORDANCE WITH N.A.C.E. STANDARD RP-0274-74. ALL COATING FLAWS SHALL BE REPAIRED IN ACCORDANCE WITH THE COATING MANUFACTURER'S RECOMMENDATIONS. EXTRA CARE MUST BE TAKEN DURING BACKFILLING OPERATIONS TO ENSURE THAT THE COATING IS NOT DAMAGED. SEE BWS STANDARDS, VOL 3, PART 3, PARAGRAPH 2.2 1.

4. VALVE COATING - ALL BURIED VALVES 4 INCHES AND LARGER DIAMETER SHALL HAVE A 15 MIL MINIMUM DRY FILM THICKNESS FACTORY APPLIED FUSION-BONDED EPOXY COATING COMPLYING WITH AWWA STANDARD C213. SEE BWS STANDARD, VOL 3, PART 3, PARAGRAPH 1 4 1.

5. ALL BURIED METALLIC PIPE JOINTS, VALVES, FLANGES, FITTINGS AND APPURTENANCES SHALL BE ELECTRICALLY BONDED ACROSS WITH NO 2 AWG COPPER BOND WIRES. EXCEPT JOINTS SPECIFIED TO BE THREADED, WELDED OR INSULATED. ALL BOND WIRE SHALL BE SINGLE CONDUCTOR STRANDED COPPER WIRE WITH 7/64 INCH THICK HIGH MOLECULAR WEIGHT POLYETHYLENE IMMUNITY INSULATION. THIS IS A CRITICAL BWS INSPECTION ITEM, AS THESE ARE FREQUENTLY AREAS WHERE CONTRACTORS FAIL TO INSTALL BOND WIRES. THIS CATHODIC PROTECTION SYSTEM MAY NOT ACHIEVE 100% OF ITS ANTICIPATED CORROSION PROTECTION IF THE PIPELINE IS NOT INSTALLED WITH THE BOND WIRES TO MAKE IT ELECTRICALLY CONTINUOUS. SEE BWS STANDARDS, VOL 3, PART 5, PARAGRAPH 1.2 AND PART 6, PARAGRAPH 1.2

6. CONTRACTOR SHALL MEASURE THE ELECTRICAL CONDUCTIVITY OF THE PIPELINE BEFORE AND AFTER BACKFILLING TO INSURE THAT ALL PIPE JOINT BOND WIRES HAVE BEEN INSTALLED CORRECTLY. ELECTRICAL CONTINUITY TESTING SHALL BE PERFORMED IN ACCORDANCE WITH PART 7, "TESTING" OF THE BWS "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991. COMPLETED FIELD DATA SHEETS SHALL BE FORWARDED TO THE BWS ENGINEER FOR APPROVAL AND CONSTRUCTION RECORD KEEPING. SEE BWS STANDARDS, VOL 3, PART 7, PARAGRAPH 7 2

7. TEST STATIONS SHALL BE INSTALLED TO MONITOR THE PERFORMANCE OF THE CATHODIC PROTECTION SYSTEM AS INDICATED ON THE DRAWINGS. ALL TEST STATIONS SHALL BE INSTALLED OUT OF TRAFFIC LANES AND BEHIND STREET ACCESS FOR TESTING.

8. THE PIPE SECTIONS TO BE CATHODICALLY PROTECTED SHALL BE ELECTRICALLY ISOLATED FROM ALL OTHER METALLIC STRUCTURES (I.E.: METALLIC SERVICE LATERALS, EXISTING WATER MAINS, AND STEEL IN THRUST BLOCKS) BY INSTALLING DIELECTRIC UNIONS, SECTIONS OF NONMETALLIC PIPE, INSULATING FLANGE KITS, OR FLAT SHEETS OF RUBBER OR GASKET STOCK AT THE THRUST BLOCKS (BWS STD, VOL 3, DETAIL, 1991). THE INSULATING FLANGE KITS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE) RP02-86, "THE ELECTRICAL INSULATION OF CATHODICALLY PROTECTED PIPELINES." AFTER INSTALLATION, THE EFFECTIVENESS OF ALL INSULATING FLANGE KITS OR INSULATING UNIONS SHALL BE VERIFIED TO BE IN CONFORMANCE WITH NACE RP02-86, SECT ON 7, " FIELD TESTING AND MAINTENANCE".

9. ALL RESIDENTIAL SERVICE LATERALS UP TO 100 PSI WORKING PRESSURE SHALL BE HIGH MOLECULAR WEIGHT POLYETHYLENE. THEREFORE, ELECTRICAL ISOLATION OF THE WATER MAIN FROM THE RESIDENCES SHALL BE ACHIEVED WITHOUT HAVING TO INSTALL ANY DIELECTRIC INSULATORS IN THE EXISTING METER BOXES. IF ANY METALLIC APPURTENANCES TO THE MAIN WATER PIPELINE ARE SUBSEQUENTLY INSTALLED, THEY MUST BE ELECTRICALLY ISOLATED FROM THE MAIN WATER PIPELINE USING DIELECTRIC UNIONS OR OTHER MEANS AS APPROVED BY THE BWS ENGINEER.

10. CONTRACTOR SHALL ACTIVATE AND TEST THE CATHODIC PROTECTION SYSTEM TO ENSURE THAT THE WATER PIPELINE IS RECEIVING A FULL LEVEL OF PROTECTION AGAINST EXTERNAL CORROSION IN ACCORDANCE WITH THE MOST RECENT CRITERION OF N.A.C.E. RP0169-92. THE CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY EQUIPMENT AND MATERIAL REQUIRED TO PERFORM ALL TESTS. TESTS AND DATA REPORTING FORMAT SHALL BE IN ACCORDANCE WITH FIGURES 5 THROUGH 10 IN PART 7, "TESTING" OF THE BWS " WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991. COMPLETED FIELD DATA SHEETS SHALL BE FORWARDED TO THE BWS ENGINEER FOR APPROVAL AND CONSTRUCTION RECORD KEEPING.

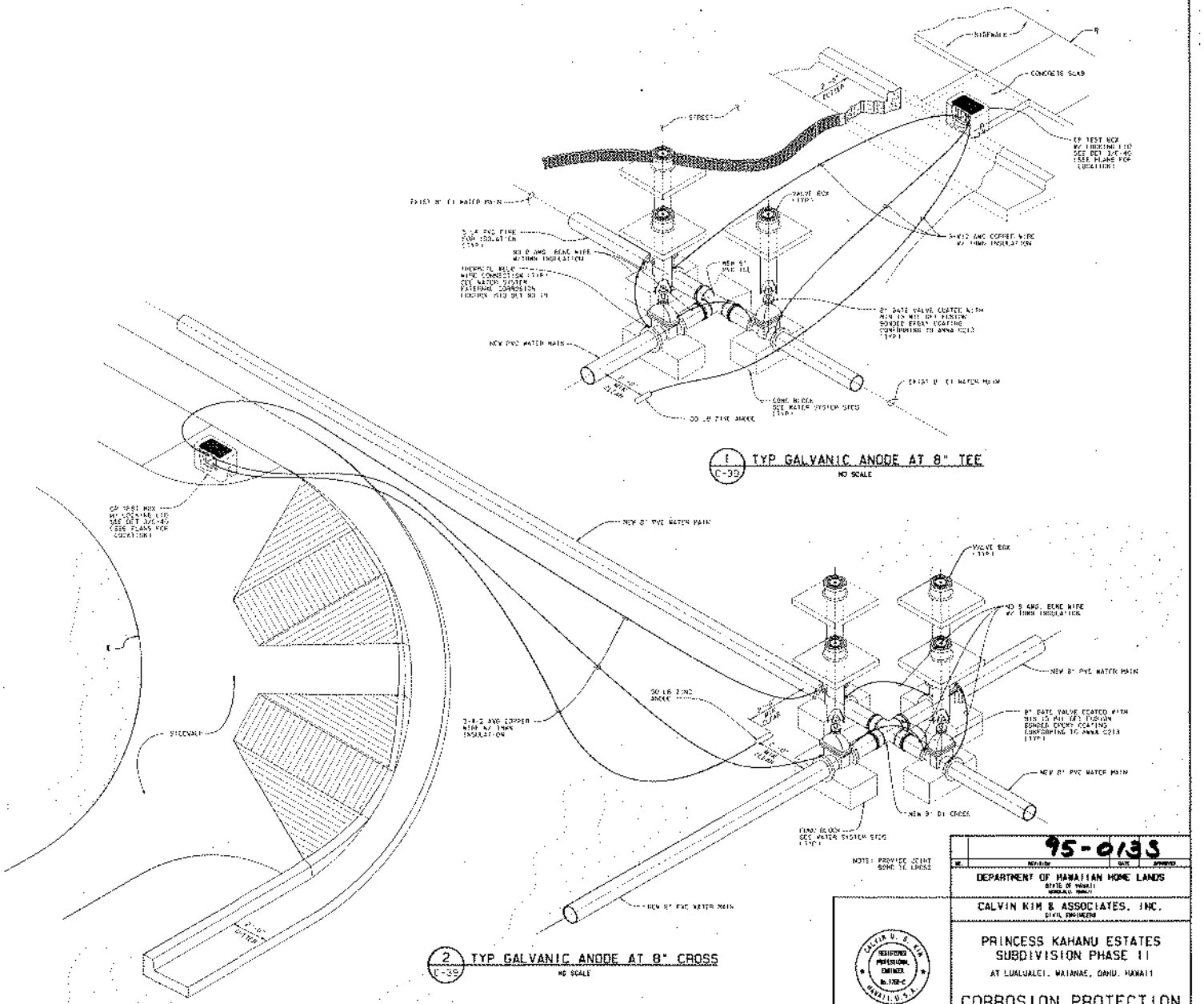
11. A QUALIFIED INDIVIDUAL OR FIRM EXPERIENCED IN INSPECTING THE INSTALLATION OF CORROSION CONTROL SYSTEMS, ACCEPTABLE TO AND APPROVED BY THE BWS SHALL BE EMPLOYED BY THE CONTRACTOR TO INSPECT THE INSTALLATION OF THE EXTERNAL CORROSION CONTROL SYSTEM. INSPECTION PERSONNEL SHALL BE UNDER THE DIRECT SUPERVISION OF A REGISTERED PROFESSIONAL CORROSION ENGINEER OR A CORROSION SPECIALIST CERTIFIED BY THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS.

12. WIRE SPLICES - WIRE SPLICES SHALL NOT BE INSTALLED ON ANY PIPE WIRES, ANODE WIRES, OR ZINC REFERENCE ELECTRODE LEAD WIRES.

13. DRAWINGS - THE DRAWINGS FOR THE CATHODIC PROTECTION SYSTEMS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED FOR EXACT LOCATIONS UNLESS SCALES ARE EXPLICITLY STATED ON THE SPECIFIC DRAWING. FIELD CONDITIONS, NON-INTERFERENCE WITH OTHER UTILITIES OR TRADE AND ARCHITECTURAL, MECHANICAL, AND STRUCTURAL FEATURES SHALL DETERMINE EXACT LOCATIONS. CONTRACTOR SHALL NOTE CHARTED EXISTING UTILITIES IN THE AREA. CARE SHALL BE TAKEN DURING EXCAVATION NOT TO DAMAGE THESE UTILITIES. ANY DAMAGED UTILITIES SHALL BE REPAIRED TO THE SATISFACTION OF THE UTILITY OWNER'S STANDARDS BY THE CONTRACTOR'S EXPENSE.

14. AS-BUILT DRAWINGS - AS-BUILT DRAWINGS FOR THE CATHODIC PROTECTION SYSTEM SHALL BE MAINTAINED BY THE CONTRACTOR DURING INSTALLATION AND CONSTRUCTION OF THE CATHODIC PROTECTION SYSTEMS. DRAWINGS SHALL BE REVISED TO SHOW EXACT LOCATIONS OF ALL ANODES, TEST BOXES, INSULATED PIPE FLANGES, AND OTHER RELATED ITEMS.

15. ALL GALVANIC ANODES SHALL BE 20 POUND ZINC ANODES AND IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUM 3, DATED 1991 AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.



APPROVED:

DIRECTOR OF BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE

95-0135

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

CORROSION PROTECTION INSTALLATION NOTES

REGISTERED PROFESSIONAL ENGINEER No. 7338-C HAWAII, U.S.A.

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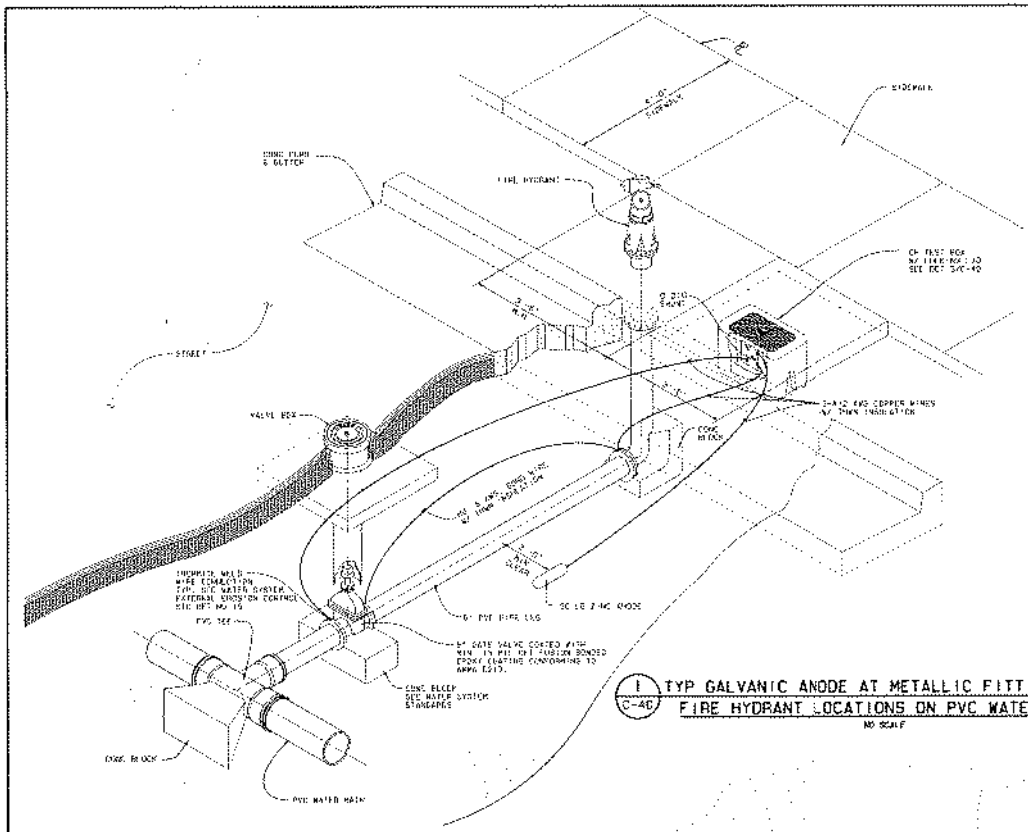
CALVIN KIM & ASSOC., INC.

PROJECT NO. | DATE | C-39

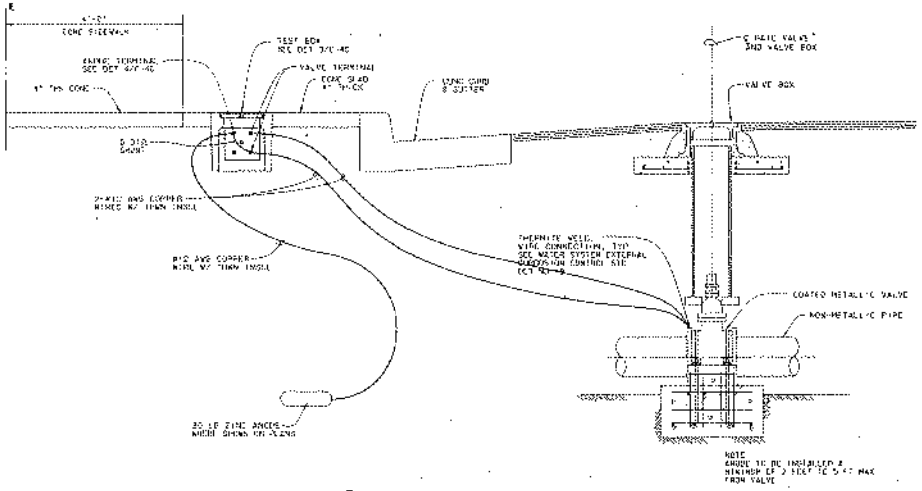
AS BUILT

SHEET 40 OF 81 SHEETS

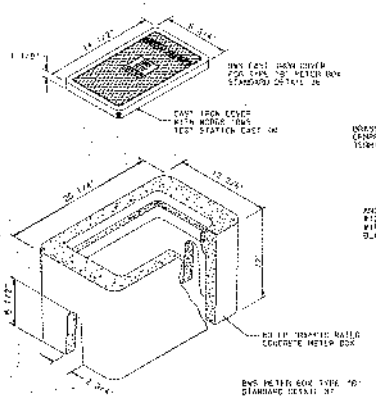
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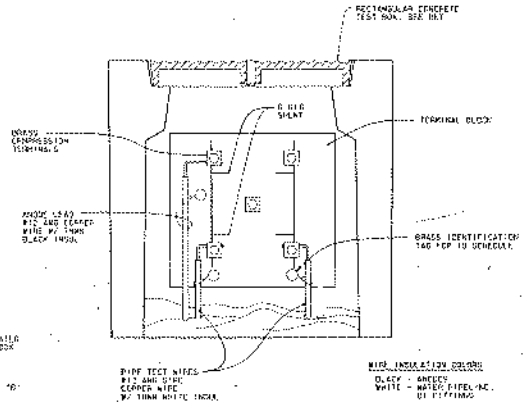
1 C-40 TYP GALVANIC ANODE AT METALLIC FITTINGS FOR FIRE HYDRANT LOCATIONS ON PVC WATERMAINS
NO SCALE



2 C-40 TYPICAL GALVANIC ANODE AT VALVE (NON-METALLIC PIPE)
NO SCALE



3 C-40 RECTANGULAR CONCRETE TEST BOX
NO SCALE

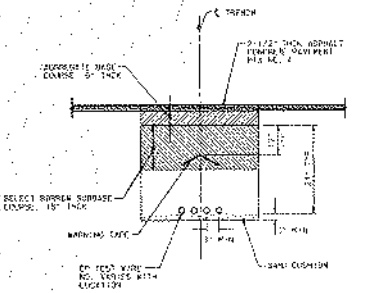


4 C-40 CP ANODE GROUNDED TEST BOX
NO SCALE



I.D. TAG SCHEDULE	
8" GATE VALVE	8" GV
6" GATE VALVE	6" GV
FIRE HYDRANT	FH
30 LB ZINC ANODE	30# Zn

5 C-40 DETAIL - I.D. TAG AND SCHEDULE
NO SCALE



6 C-40 DETAIL - CP TEST WIRE TRENCH
NO SCALE

95-0135

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

CATHODIC PROTECTION ANODE GROUNDED INSALLATION

C-40

APPROVED:

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CALVIN KIM & ASSOC., INC.

AS BUILT

SHEET 41 OF 81 SHEETS

PRINCESS KAHANU ESTATES SUBDIVISION — PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

TAX MAP KEY 8-7-07:4 AND 8-7-33:14 & 19

OWNER : DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

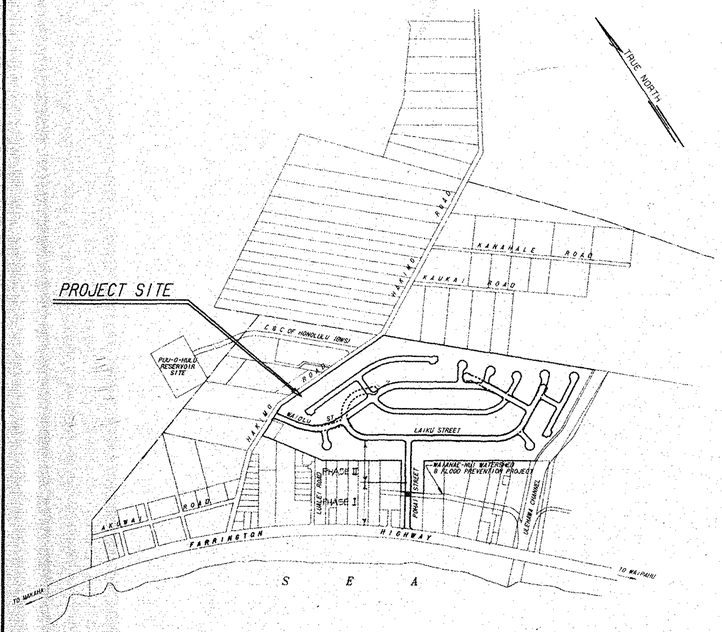
DEVELOPER : PRINCESS KAHANU DEVELOPMENT CORPORATION

INSPECTOR'S COPY

Res. Engr. Ted Saito
Inspector David Never
Date Final Inspection 10/8/86
Pipe 8" DIP (Mossco Clay)
Cradle Schuster Rock
Contractor Oahu Construction

INSPECTOR'S COPY
RECORD PLAN - DO NOT DESTROY

Princess Kahanu Est. Ph II



LOCATION MAP

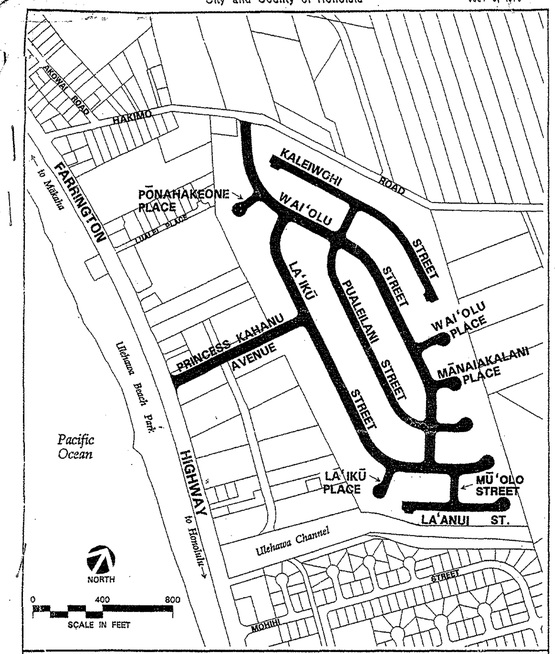
GRAPHIC SCALE IN FEET
500' 0 500' 1000'
1"=500'

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DEPARTMENT OF LAND UTILIZATION
City and County of Honolulu

ORDINANCE NO. 79-34
JULY 3, 1979



OFFICIAL STREET NAME MAP NO. 94/SN-24

Street names for roadways within the Princess Kahanu Estates Subdivision at Lualualei, Wai'anae, O'ahu, Hawai'i

(For street name meanings see Sheet 2 of 2)

42B
25

CALVIN D. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 7769-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOCIATES, INC.

FILE	POCKET	FOLDER	

BWS WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, AND THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS," VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. NUTS AND BOLTS FOR FLANGED CONNECTIONS WITHIN METER BOXES SHALL BE BRONZE OR STAINLESS STEEL EXCEPT COUPLING ADAPTERS WHERE "COR-TEN" (U.S. STEEL) OR "MAYARI" (BETHLEHEM STEEL) MAY BE USED. FLANGED CONNECTIONS OUTSIDE OF METER BOX MAY USE "COR-TEN" OR "MAYARI" TYPE NUTS AND BOLTS.
3. TEST PRESSURE SHALL BE ONE OF THE FOLLOWING:
   a. PREVAILING LINE PRESSURE. JOINTS LEFT EXPOSED FOR 24 HOURS TO CHECK FOR LEAKS PRIOR TO BACKFILL.
   b. 150 PSI.
4. THE CONTRACTOR SHALL CHLORINATE THE ENTIRE INSIDE SURFACE OF EACH PIPE AND FITTING WITH DISINFECTION SOLUTION OF 5 OUNCES OF SODIUM HYPOCHLORITE MIXED WITH 10 GALLONS OF WATER.(FOR CONNECTION ONLY)
5. THE CONTRACTOR SHALL NOTIFY BWS PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION, ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
6. CONTRACTOR SHALL CUT AND PLUG ALL EXISTING UNUSED LATERALS AT THE MAIN WHETHER OR NOT SHOWN ON THE PLANS. METER AND VALVE BOXES TO BE OR ALREADY ABANDONED SHALL BE DEMOLISHED OR REMOVED AND PROPERLY DISPOSED OF. THE DAMAGED AREA SHALL BE REPAIRED TO AN EQUAL OR BETTER CONDITION THAN THE IMMEDIATE AREA. ALL WORK SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.
7. ALL PLANS APPROVED BY THE BOARD OF WATER SUPPLY ARE BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY. ALL OTHER FEATURES OF THE WATER SYSTEM, SUCH AS LINES, GRADES, FITTINGS, DRAINAGE, ETC., AND OTHER FEATURES OF IMPROVEMENTS SHALL NOT BE THE RESPONSIBILITY OF THE BOARD OF WATER SUPPLY.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WATER LINES DURING CONSTRUCTION. THE CONTRACTORS SHALL BE ESPECIALLY CAREFUL WHEN EXCAVATING BEHIND WATER LINES, TEES AND BENDS WHEREVER THERE IS A POSSIBILITY OF WATER LINE MOVEMENT DUE TO REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURE NECESSARY TO PROTECT THE WATER LINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BWS APPROVAL) AND/OR MODIFYING HIS CONSTRUCTION METHOD.
9. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES.
10. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL CAST IRON (GRAY OR DUCTILE) FITTINGS FOR THE PROJECT CONFORM IN ALL RESPECTS TO THE WATER SYSTEM STANDARDS, DATED 1985.
11. POLYGON SHAPE FOR MECHANICAL JOINT GLANDS AS DESCRIBED IN AWWA STANDARD C111 SHALL BE "STRAIGHT-SIDED" OR AN APPROVED EQUAL ON A JOB TO JOB BASIS.
12. REAPPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.
13. ALL WATER CONSTRUCTION REQUIRING SHUTDOWN SHALL BE SCHEDULED FOR AFTER WORKING HOURS AND MAXIMUM DOWNTIME SHALL BE SIX (6) HOURS.
14. PRESSURE REGULATORS ARE RECOMMENDED FOR ALL LOTS.
15. UNLESS OTHERWISE SPECIFIED, ALL LATERALS AND CONNECTIONS SHALL BE PLASTIC TYPE "C-1" WITH BLIND METER SPLICE LENGTHS TO ACCOMMODATE 3/4" METERS.
16. WATER COMMITMENT SHALL BE CANCELLED IF THE APPROVED CONSTRUCTION PLANS ARE ALLOWED TO LAPSE.
17. THE CONTRACTOR SHALL FURNISH AND INSTALL DIELECTRIC COUPLINGS FOR ALL COPPER SERVICE LATERAL CONNECTIONS.
18. ADEQUATE OFFSITE FIRE PROTECTION MEETING THE BWS STANDARD SHALL BE INSTALLED AND COMPLETED PRIOR TO CONSTRUCTION OF HOMES INCLUDING MODEL HOMES.
19. AT THE ELECTRICAL/SIGNAL DUCTLINE WATER CROSSINGS, ADJUST ALL ELECTRICAL/SIGNAL DUCTLINE ELEVATIONS TO MAINTAIN 6" VERTICAL CLEAR SEPARATION FROM ALL WATERLINES (12" CLEAR FOR ALL ELECTRICAL/SIGNAL DUCTLINE STRUCTURES LARGER THAN 16") AT NO COST TO THE BOARD OF WATER SUPPLY.
20. MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATER-LINE SYSTEMS AND NEAREST ELECTRICAL/SIGNAL DUCTLINES PARALLELING THE WATER SYSTEM AT NO COST TO THE BOARD OF WATER SUPPLY.
21. MAINTAIN 3'-0"MIN. HORIZONTAL CLEAR SEPARATION BETWEEN STREET LIGHT/TRAFFIC SIGNAL STANDARDS (INCLUDING ANY MODULAR UNITS) AND THE NEAREST WATER SYSTEM. CONTRACTOR SHALL FIELD VERIFY FOR ANY CONFLICTS AT EACH STREET LIGHT/TRAFFIC SIGNAL STANDARD LOCATION. WHERE CONFLICTS OCCUR, THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER TO REVISE THE STREET LIGHT/TRAFFIC SIGNAL STANDARD TO PROVIDE THE REQUIRED CLEARANCES AT NO COST TO THE BWS.
22. THE CONTRACTOR/DEVELOPER SHALL OBTAIN A NPDES PERMIT PRIOR TO CHLORINATION AND/OR DEWATERING. A COPY OF THE PERMIT SHALL BE SUBMITTED TO THE BOARD OF WATER SUPPLY, PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION.
23. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES SHALL BE SUPPLIED WITH A FUSION BONDED EPOXY COATING. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE, ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE AND ALL NON-METALLIC LATERALS.
24. ALL POLYVINYL CHLORIDE (PVC) PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY USE OF PVC DEFLECTION COUPLINGS.
25. ALL PVC FITTINGS FOR CLASS 150 C-900 PVC PIPES SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) C-907. ALL TYPES OF FITTINGS NOT SPECIFIED IN AWWA C-907 ARE NOT APPROVED.
26. REACTION BLOCK REQUIREMENTS FOR PVC FITTINGS SHALL BE THE SAME AS FOR DUCTILE IRON FITTINGS.
27. PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BOARD, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM IN ALL RESPECTS TO AWWA C-907.
28. THE USE OF HUB CLAMPS AND SET SCREWS ON PVC FITTING IS NOT APPROVED.
29. THE CONTRACTOR SHALL ADJUST ALL MANHOLE FRAMES/VALVE BOXES WITHIN THE RESURFACED AREA. PRIOR TO RESURFACING, BWS WILL INITIALLY LOCATE ALL WATER MANHOLES/VALVE BOXES THAT WILL REQUIRE ADJUSTMENTS. THE CONTRACTOR SHALL THEN BE RESPONSIBLE FOR "REFERENCING" THESE MANHOLES/VALVE BOXES TO FACILITATE THE ADJUSTMENTS. THE COST FOR ADJUSTMENTS SHALL BE MADE AT THEIR RESPECTIVE UNIT PRICES IN THE BID BASED ON THE ACTUAL NUMBER ADJUSTED. COST FOR REFERENCING SHALL BE INCIDENTAL AND SHALL NOT BE PAID FOR DIRECTLY. ANY ADDITIONAL REQUEST TO BWS TO AGAIN LOCATE THE MANHOLES/VALVE BOXES SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR. (BWS WILL CHARGE AND BILL THE CONTRACTOR FOR ALL COST FOR SAID ADDITIONAL WORK).
30. ANY ADJUSTMENTS TO THE EXISTING WATER SYSTEM REQUIRED DURING CONSTRUCTION TO MEET REQUIREMENTS OF BWS STANDARDS, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE DONE BY THE CONTRACTOR AT NO COST TO THE BOARD.
31. PRIOR TO ANY EXCAVATING, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.
32. BWS WILL NOT SEND COMPLETION NOTICE TO DLU UNTIL EASEMENT DOCUMENTS ARE SUBMITTED TO BWS AND RECORDED.
33. UPON COMPLETION OF THE PROJECT, THE DEVELOPER SHALL PROVIDE THE BWS A CERTIFICATE FROM A REGISTERED SOILS ENGINEER CERTIFYING THAT THE ROAD PRISM HAS BEEN CONSTRUCTED IN ACCORDANCE TO CITY AND COUNTY ROAD STANDARDS.
34. ACCORDING TO THE SOIL RESISTIVITY AND PH TEST "PRINCESS KAHANU ESTATES SUBDIVISION" DATED APRIL 26, 1994, BY HAWAII GEOTECHNICAL GROUP, INC., THE SOIL HAS A CORROSION RATING OF "1". THE CONTRACTOR SHALL PROVIDE CORROSION PROTECTION MEASURES CONSISTENT FOR A CORROSION RATING OF "1", AS STATED IN THE BWS "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS" VOLUME 3, DATED 1991.
35. PRIOR TO METER BEING ISSUED, THE DEPARTMENT OF HAWAIIAN HOMELANDS SHALL DESIGNATE THE WATER USE PERMIT TO THE BWS WAIPAHU III WELLS.
36. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT BACKFILL HAS A RESISTIVITY GREATER THAN 5000 OHM-CM.

TRAFFIC NOTES FOR WORK ON C&C STREETS

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN.
2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS IN THE STATE OF HAWAII", ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," PART VI, "TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".
3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
4. DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE TWO LANES FOR THROUGH TRAFFIC. ON STREETS TOO NARROW TO MAKE THIS PRACTICABLE, THE CONTRACTOR MAY WORK ON ONE-HALF OF THE ROADWAY, KEEPING THE OTHER HALF OPEN TO TRAFFIC AND ALTERNATING THE FLOW OF TRAFFIC.
5. DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL, AND ALL LANES SHALL BE OPENED TO TRAFFIC.
6. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
7. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
8. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
9. THE CONTRACTOR SHALL REFERENCE, TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES, ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT 523-4029 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POSTS AND PAVEMENT MARKINGS.
10. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
11. STATE DEPARTMENT OF HAWAIIAN HOME LANDS SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE #2.

ELECTRICAL AND MAINTENANCE SERVICE DIVISION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.
2. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE STREET LIGHTING SYSTEM (PHONE 527-5002).
3. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE 527-5007).
4. STREET LIGHTING AND TRAFFIC SIGNALS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION OR CHANGEOVER REQUIRED SHALL BE APPROVED BY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES AND PERFORMED AND PAID FOR BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING STREET LIGHTING AND TRAFFIC SIGNAL FACILITIES AND DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY & COUNTY OF HONOLULU.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, SEPTEMBER 1986, THE DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS, SEPTEMBER 1984, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT VOLUME 1, JULY 1993.
2. IN THE EVENT THAT ANY CHANGES IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICTS WITH OTHER UTILITIES, THE ENGINEER IN CHARGE OR THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES WHICH ARE TO BE PRESENTED TO THE DEPARTMENT OF WASTEWATER MANAGEMENT FOR APPROVAL.
3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DEPARTMENT OF WASTEWATER MANAGEMENT, AT 527-5920 OR 523-4345, TO ARRANGE FOR INSPECTION SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN DAYS PRIOR TO COMMENCEMENT OF SEWER WORK.
4. CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED.
5. TREES IN THE ROAD RIGHT-OF-WAY SHALL BE SITUATED A MINIMUM OF 6'-0" FROM THE CITY'S SEWER LINES.
6. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA.
7. SEWER LATERAL LOCATION MEASURED ALONG THE FRONT PROPERTY LINE SHALL BE 6'-0" FROM THE PROPERTY CORNER UNLESS OTHERWISE NOTED ON THE PLANS AND SHOULD NOT STRADDLE ELECTRICAL TRANSFORMER PAD.
8. SLOPE FOR SEWER LATERALS SHALL BE 1.00% UNLESS OTHERWISE NOTED.
9. BUILDING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
11. THE CONSULTING ENGINEER SHALL SUBMIT TO THE DEPT. OF WASTEWATER MANAGEMENT MYLAR "AS-BUILT" TRACINGS OF THE CONSTRUCTION PLANS AS ACTUALLY CONSTRUCTED, SHOWING ALL CHANGES FROM THE ORIGINAL PLANS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES.
13. THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.
14. FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(b), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
    1. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
        a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
        b. LIFELINE AND ASSOCIATED CLIPS.
        c. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
        d. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
        e. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
        f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
        g. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
        h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
    2. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
    3. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
15. ALL DROP AND SHALLOW DROP SEWER MANHOLES SHALL BE LINED WITH PLASTIC LINERS. ALSO, IF THE VELOCITY EXCEEDS 10 FPS, THE SEWER MANHOLE SHALL BE PLASTIC LINED.
16. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR ADVANCE SEWER RISER AGREEMENT AT THE DEPT. OF WASTEWATER MANAGEMENT AND OBTAIN PLUMBING PERMIT BEFORE ANY ADVANCE RISER IS MADE.
17. ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER.
18. SEWER PIPES 30 INCHES AND LARGER SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED INTERNALLY WITH LINING.
19. S4C PIPE CRADLE SEALS SHALL BE INSTALLED 10 FEET FROM ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION.
20. GEOTEXTILE FABRIC TO ENVELOP THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.
21. DHHL SHALL PAY TO THE CITY THE APPLICABLE WASTEWATER SYSTEM FACILITY CHARGE.
22. THE PRINCESS KAHANU ESTATES COMMUNITY ASSOCIATION SHALL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE SEWER SYSTEM OUTSIDE OF THE PUBLIC ROAD RIGHT-OF-WAY.
23. THE DEPARTMENT OF HAWAIIAN HOMELANDS (DHHL) SHALL GRANT AN EASEMENT IN FAVOR OF THE CITY AND COUNTY OF HONOLULU THROUGH A LICENSE AGREEMENT FOR MAINTENANCE OF THE SEWER SYSTEM WITHIN THE ROADWAY EASEMENT RIGHT-OF-WAY.

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1984, AS AMENDED, AND THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU.
2. ALL EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.
3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 527-6311 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.
4. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
5. BENCH MARKS SHALL BE ESTABLISHED ON NEW STREET MONUMENTS AND THE DATA SUBMITTED TO THE DIVISION OF ENGINEERING.
6. ALL EXISTING IMPROVEMENTS WITHIN THE CITY'S JURISDICTION OR CITY MAINTAINED ROAD R/W THAT ARE DISTURBED DURING THE CONSTRUCTION PHASE SHALL BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION AT NO COST TO THE CITY.
7. FOR BENCHMARK, SEE SHEET C-6.

STREET NAME SIGNS

1. STREET NAME SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE DEPARTMENT OF TRANSPORTATION SERVICES. THE EXACT LOCATION SHALL BE DETERMINED BY THE DIRECTOR OF TRANSPORTATION SERVICES. IN LIEU OF THE STANDARD EMBOSSED SIGNS, REFLECTORIZED STREET NAME SIGNS AND SIGN BRACKETS IDENTICAL TO THAT PRESENTLY USED BY THE DEPARTMENT OF TRANSPORTATION SERVICES MAY BE INSTALLED.

LIST OF EXEMPTIONS BY DEPARTMENT OF HAWAIIAN HOME LANDS

(PERTAINING TO DEPARTMENT OF TRANSPORTATION SERVICES & DEPARTMENT OF PUBLIC WORKS)

A. THE DESIGN SPEED OF NEW 56-FT WIDE ROADWAYS SHALL BE 25 MPH.

1. SIGHT DISTANCE PROPERTY LINE SETBACK DESIGNED FOR 25 MPH IN LIEU OF 30 MPH AT THE FOLLOWING INTERSECTIONS:
   R. WAIOLU STREET AND ROAD "A".(P.I.STA.9+35.15 WAIOLU ST.)
   b. WAIOLU STREET AND ROAD "A".(P.I.STA.21+59.94 WAIOLU ST.)
   c. WAIOLU STREET AND LAIKU STREET.
   (SIGHT DISTANCE FOR 30 MPH SHALL BE PROVIDED WITHIN PROPERTIES.)
2. VERTICAL CURVE (STA.0+26.39 TO 1+76.39 WAIOLU ST) IS 150' INSTEAD OF 200'.

B. EXISTING ROADWAYS SHALL NOT BE RECONSTRUCTED TO MEET CURRENT MINIMUM CENTERLINE RADIUS REQUIREMENTS.

1. CURVES AFFECTED: LAIKU STREET STA.0+92.33 TO STA.2+82.80 CENTERLINE R = 203.00' IN LIEU OF 380'.
   LAIKU STREET STA.14+01.62 TO STA.17+02.56 CENTERLINE R = 280.00' IN LIEU OF 380'.

C. CONSTRUCTION OF HAKIMO ROAD FRONTAGE IMPROVEMENTS SHALL BE DEFERRED UNTIL SUCH TIME THAT THE CITY AND COUNTY OF HONOLULU UNDERTAKES A FULL WIDENING OF HAKIMO ROAD. THE DEPARTMENT OF HAWAIIAN HOME LANDS WILL PAY ITS FAIR SHARE AT THAT TIME FOR THE COST OF IMPROVEMENTS FRONTING ITS SITE.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/2/94

APPROVED:
DIRECTOR OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, CITY & COUNTY OF HONOLULU — DATE 3/15/95

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

CONSTRUCTION NOTES

PROJECT NO.
DATE JULY 18, 1994
C-1

SHEET 2 OF 81 SHEETS

FILE	POCKET	FOLDER	NO.

PIPE HYDRAULIC DATA

PIPE NO.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A (Ac.)	30.72	28.74	15.30	13.63	13.63	11.60	11.05	10.90	9.74	9.38	4.60	3.91	3.45
Q (cfs)	65.56	61.74	30.62	27.40	27.40	23.48	22.42	22.13	23.09	22.40	10.72	9.39	8.50
Dia. (in.)	48	48	30	30	30	30	30	30	30	30	18	18	18
S (%)	0.25	0.49	1.16	0.86	0.39	0.38	0.59	0.41	0.40	0.73	1.40	0.46	0.49
Dn (ft.)	3.00	2.26	1.52	2.50	2.50	2.50	2.50	2.50	2.50	2.50	1.50	1.50	1.50
v (fps)	6.48	8.43	9.80	5.58	5.58	4.78	4.57	4.51	4.70	4.56	6.07	5.31	4.81

PIPE NO.	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
A (Ac.)	1.58	1.58	0.92	12.61	11.85	10.57	9.15	8.94	1.29	0.23	---	7.10	5.48
Q (cfs)	3.58	3.58	2.30	29.51	28.05	25.58	22.84	22.43	5.69	3.64	3.20	15.68	12.55
Dia. (in.)	18	18	18	30	30	30	30	30	18	18	18	18	18
S (%)	0.65	0.44	0.94	0.48	0.57	0.44	0.70	0.90	0.75	0.51	0.48	2.40	0.79
Dn (ft.)	1.50	1.50	1.50	2.50	1.63	1.95	1.47	1.38	1.50	1.50	0.74	1.50	1.50
v (fps)	2.03	2.03	1.30	6.01	7.28	6.23	7.61	8.07	3.22	2.06	3.68	8.87	7.10

PIPE NO.	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)
A (Ac.)	5.48	3.94	3.80	3.35	2.93	2.11	1.42	0.63	---	0.78	1.08	0.73	1.16
Q (cfs)	12.55	9.58	9.31	7.88	7.07	5.48	4.15	1.22	---	1.51	2.08	1.41	2.24
Dia. (in.)	18	18	18	18	18	18	18	18	18	18	18	18	18
S (%)	1.78	5.52	9.94	1.16	0.32	0.50	1.32	2.15	1.78	0.22	1.33	0.36	7.50
Dn (ft.)	1.50	0.65	0.55	1.50	1.50	1.50	1.50	0.28	---	1.50	1.50	0.47	0.28
v (fps)	7.10	13.05	15.86	4.46	4.00	3.10	2.35	5.33	---	0.85	1.18	2.98	9.82

PIPE NO.	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(64)	(65)	(D2)
A (Ac.)	0.19	0.66	0.70	0.55	1.62	1.45	0.90	0.46	0.67	1.22	0.59	13.63
Q (cfs)	0.37	3.88	1.35	1.06	3.13	2.80	3.80	0.89	1.29	2.35	1.14	27.40
Dia. (in.)	18	18	18	18	18	18	18	18	18	18	18	30
S (%)	1.00	1.20	1.48	2.46	0.95	4.89	1.20	1.00	0.50	0.45	1.00	0.43
Dn (ft.)	1.50	1.50	0.35	1.50	1.50	1.50	1.50	1.50	1.50	0.60	0.35	2.50
v (fps)	0.21	2.20	4.31	0.60	1.77	1.58	2.15	0.50	0.73	3.57	3.63	5.58

HYDROLOGIC DATA

RECURRENCE INTERVAL Tm = 10 Years
ONE HOUR RAINFALL I = 1.8 in/hr
RUNOFF COEFFICIENT C = 0.55

TRUE NORTH SCALE: 1" = 60'

HAKIMO ROAD (CITY ROADWAY - CITY MAINTAINED)

1082.49

267° 41'

10' WIDE ROADWAY LOT

DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS

(DHHL ROADWAY - CITY MAINTAINED) ROAD "B"

KALAWAHI

DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS

DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS

312° 44'

1852.12

MATCH LINE

(DHHL ROADWAY - CITY MAINTAINED) WAIOLU STREET (SEE SHTS 14 - 18)

(DHHL ROADWAY - CITY MAINTAINED) PUALEILANI ROAD "A" (SEE SHTS 19 & 20)

EXIST ROAD IMPROVEMENTS TO BE DEMOLISHED

RELOCATE EXIST FH L#2797

RELOCATE EXIST FH L#3038

EXIST WATER TO BE ABANDONED

RELOCATE EXIST FH L#2795

RELOCATE EXIST FH L#2799

EXIST WATER TO BE ABANDONED

EXIST WATER TO BE ABANDONED

RELOCATE EXIST FH L#2811

EXIST 8" WATER TO BE ABANDONED

DRAINAGE EASEMENT 10' WIDE IN FAVOR OF C&C OF HONOLULU

SEWER EASEMENT GRANTED IN FAVOR OF C&C OF HONOLULU

SEWER LINE "L-A"

DRAIN LINE "L-A"

(EXIST DHHL ROADWAY - CITY MAINTAINED) LAIKU STREET (SEE SHTS 9 - 13)

MATCH LINE

PHASE II

MATCH ROADWAY CONSTRUCTED UNDER PHASE I

NEW "B" LAT.

SEE INSET

DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS (LOT 16-J)

123° 57' 695.00

123° 57' 971.92

TO FARRINGTON HIGHWAY

265°-35'

139.60

46.02

100.00

150.00

246°-35'

146° 02'

457.92

SMS HAKIMO BOOSTER PUMPING STATION

PROPOSED CHILD CARE CENTER (BY OTHERS)

DRAINAGE EASEMENT 5' WIDE IN FAVOR OF LOTS 182, 183 & 184.

(DHHL ROADWAY - CITY MAINTAINED) ROAD "C"

RELOCATED FH# SEWER EASEMENT WITHIN FAVOR OF C&C OF HONOLULU

PRIVATE DRIVEWAY #1

PRIVATE DRIVEWAY #3

PRIVATE DRIVEWAY #4

PRIVATE DRIVEWAY #5

PRIVATE DRIVEWAY #6

INC. SCHOOL ZONE

MCCOY

NOTE: WATER EASEMENT OVER DHHL ROADWAYS SHALL BE GRANTED TO THE BOARD OF WATER SUPPLY.

NOTES (SEWER):

1. FOR TYPICAL UTILITY LATERAL LAYOUT PLAN FOR PRIVATE DRIVEWAYS, SEE SHEET C-33.
2. ALL PUBLIC STREETS CREATED BY THIS PROJECT ARE OWNED BY THE STATE OF HAWAII DEPARTMENT OF HAWAIIAN HOMELANDS AND WILL BE CONVEYED TO THE CITY AND COUNTY OF HONOLULU FOR MAINTENANCE OF ROADWAYS ONLY. SEE SEWER NOTE NO. 23 ON SHEET C-1.
3. ALL EXISTING SEWERS AND DRAIN SHALL BE CLEANED AND REPAIRED TO THE SATISFACTION OF THE CITY. EXISTING SEWERS CONSTRUCTED UNDER: "NANAKULI PDH (KEYSTONE) PROJECT"

INSET

PHASE II

MATCH ROADWAY CONSTRUCTED UNDER PHASE I

123° 57' 695.00

123° 57' 971.92

TRUE NORTH SCALE: 1" = 60'

POHAKU STREET (SEE SHTS 7 & 8) (EXIST DHHL ROADWAY - CITY MAINTAINED)

297.12

308.06

214° 17'

34° 17'

15'x 8' BOX CULVERT PLANS BOUND SEPARATELY

127° 07', 186.91

307° 07', 186.91

ULEHAWA STREAM & TRIBUTARIES ZONE D-2

PROPOSED ADMINISTRATION OFFICE

FLOOD ZONE D

CUT & PLUG

NEW FH (TO BE INSTALLED UNDER PHASE I)

FLOOD ZONE AE (10 FT)

PROPOSED PARKING AREA FOR BOATS

FLOOD ZONE AE (12 FT)

284.33

297.34

214° 17'

34° 17'

131° 06' 188.00

FARRINGTON HIGHWAY (STATE HIGHWAY)

NO.	REVISION	DATE	APPROVED
1	RELOCATE EXIST FH # L2794 TO STA 5+53.03 RD "C", RELOCATE TYPE "B" LAT AT LOTS 176 & 181, CONSTRUCTION INC. TO THE PRE WATER SYSTEM AT STA 1+35 ROAD "A"		BWS 4/29/96

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

GENERAL PLAN

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)
1/24/96 DATE

APPROVED:
CHIEF, PLANNING & ENGINEERING
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
12/7/94 DATE

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY R/W ONLY)
10/12/94 DATE

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW
CITY & COUNTY OF HONOLULU
3/15/95 DATE

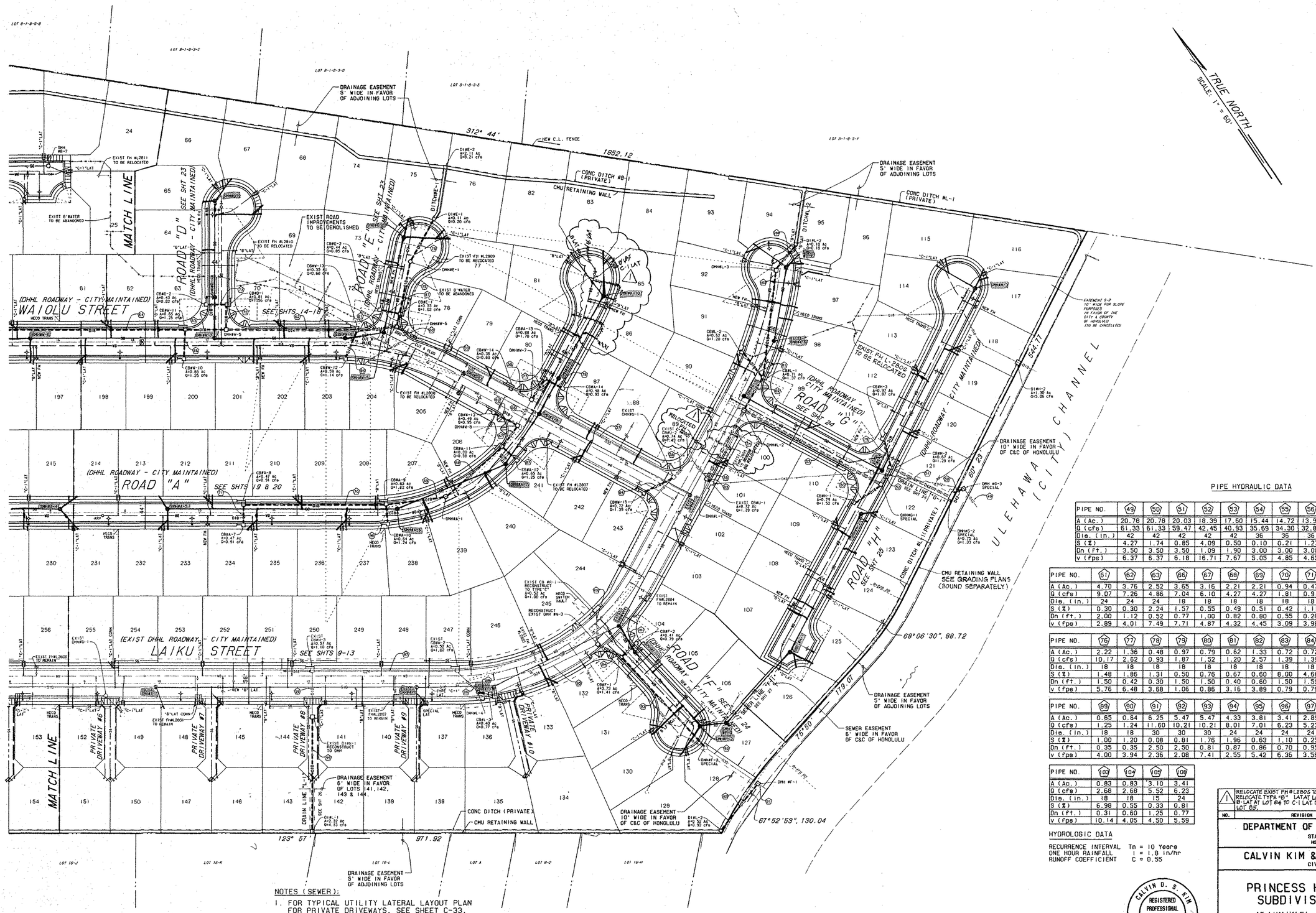
CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

PROJECT NO.
DATE JULY 18, 1994
C-2

SHEET 3 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.



NOTE: WATER EASEMENT OVER DHHL ROADWAYS SHALL BE GRANTED TO THE BOARD OF WATER SUPPLY.

NOTES (SEWER):

1. FOR TYPICAL UTILITY LATERAL LAYOUT PLAN FOR PRIVATE DRIVEWAYS, SEE SHEET C-33.
2. ALL PUBLIC STREETS CREATED BY THIS PROJECT ARE OWNED BY THE STATE OF HAWAII DEPARTMENT OF HAWAIIAN HOMELANDS AND WILL BE CONVEYED TO THE CITY AND COUNTY OF HONOLULU FOR MAINTENANCE OF ROADWAYS ONLY. SEE SEWER NOTE NO. 23 ON SHEET C-1.
3. ALL EXISTING SEWERS AND DRAIN SHALL BE CLEANED AND REPAIRED TO THE SATISFACTION OF THE CITY. EXISTING SEWERS CONSTRUCTED UNDER: "NANAKULI PDH (KEYSTONE) PROJECT"

PIPE HYDRAULIC DATA

PIPE NO.	49	50	51	52	53	54	55	56	57	58	59	60
A (Ac.)	20.76	20.76	20.03	18.39	17.60	15.44	14.72	13.98	13.26	8.25	7.89	7.89
Q (cfs)	61.33	61.33	59.47	42.45	40.93	35.69	34.30	32.87	31.48	21.81	21.11	21.11
Dia. (in.)	42	42	42	42	42	36	36	36	36	30	30	30
S (%)	4.27	1.74	0.85	4.09	0.50	0.10	0.21	1.27	0.42	0.51	0.51	0.52
Dn (ft.)	3.50	3.50	3.50	1.09	1.90	3.00	3.00	3.00	1.90	2.50	1.57	1.57
v (fps)	6.37	6.37	6.18	16.71	7.67	5.05	4.85	4.65	6.67	4.44	6.51	6.51

PIPE NO.	61	62	63	66	67	68	69	70	71	72	73	74	75
A (Ac.)	4.70	3.76	2.52	3.65	3.16	2.21	2.21	0.94	0.47	1.24	0.43	3.19	2.22
Q (cfs)	9.07	7.26	4.86	7.04	6.10	4.27	4.27	1.81	0.91	2.39	0.83	12.04	10.17
Dia. (in.)	24	24	24	18	18	18	18	18	18	18	18	18	18
S (%)	0.30	0.30	2.24	1.57	0.55	0.49	0.51	0.42	1.11	1.51	1.30	8.51	1.12
Dn (ft.)	2.00	1.12	0.52	0.77	1.00	0.82	0.80	0.55	0.28	0.42	0.28	0.65	1.50
v (fps)	2.89	4.01	7.49	7.71	4.87	4.32	4.45	3.09	3.98	5.91	3.64	16.41	5.76

PIPE NO.	76	77	78	79	80	81	82	83	84	85	86	87	88
A (Ac.)	2.22	1.36	0.48	0.97	0.79	0.62	1.33	0.72	0.72	0.59	0.65	0.44	0.49
Q (cfs)	10.17	2.62	0.93	1.87	1.52	1.20	2.57	1.39	1.39	1.14	1.25	0.85	0.95
Dia. (in.)	18	18	18	18	18	18	18	18	18	18	18	18	18
S (%)	1.48	1.86	1.31	0.50	0.76	0.67	0.60	8.00	4.68	1.25	0.75	1.20	1.14
Dn (ft.)	1.50	0.42	0.30	1.50	1.50	0.40	0.60	1.50	1.50	0.30	0.40	1.50	0.30
v (fps)	5.76	6.48	3.58	1.06	0.86	3.16	3.89	0.79	0.79	4.53	3.32	0.48	3.76

PIPE NO.	89	90	91	92	93	94	95	96	97	98	99	100	101
A (Ac.)	0.65	0.64	6.25	5.47	5.47	4.33	3.81	3.41	2.89	2.32	2.32	0.52	0.41
Q (cfs)	1.25	1.24	11.60	10.21	10.21	8.01	7.01	6.23	5.23	4.13	4.13	1.00	0.79
Dia. (in.)	18	18	30	30	30	24	24	24	24	18	18	18	18
S (%)	1.00	1.20	0.08	0.81	1.76	1.96	0.63	1.10	0.25	2.75	0.50	2.25	1.60
Dn (ft.)	0.35	0.35	2.50	2.50	0.81	0.87	0.86	0.70	0.95	0.50	0.80	0.25	0.25
v (fps)	4.00	3.94	2.36	2.08	7.41	2.55	5.42	6.36	3.36	8.01	4.31	5.18	4.09

PIPE NO.	103	104	105	108
A (Ac.)	0.83	0.83	3.10	3.41
Q (cfs)	2.68	2.68	5.52	6.23
Dia. (in.)	18	18	15	24
S (%)	6.98	0.55	0.33	0.81
Dn (ft.)	0.31	0.60	1.25	0.77
v (fps)	10.14	4.05	4.50	5.59

HYDROLOGIC DATA

RECURRENCE INTERVAL Tm = 10 Years
ONE HOUR RAINFALL I = 1.8 in/hr
RUNOFF COEFFICIENT C = 0.55

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/16/94

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW — DATE 3/15/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 7768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED
1	RELOCATE EXIST FH #L2805 TO E 1515.80' "LAIKU"; RELOCATE TYPE "D1" LAT AT LOT 83 & 86; CHANGE B-LAT AT LOT 84 TO C-1 LAT; DELETE B LAT AT LOT 85;	4/20/95	EK-LS

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

GENERAL PLAN

PROJECT NO. | DATE JULY 18, 1994 | C-3

FILE | POCKET | FOLDER | NO.

PHASE I IMPROVEMENTS
(BOUND SEPARATELY)
"PRINCESS KAHNAU ESTATES SUBDIVISION
PHASE I - POHAI STREET"

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

TRUE NORTH
SCALE: 1" = 20'

POHAI STREET
SEE SHT 8 (C-7)

APPROX LOCATION OF CENTER STRIPING
"NANAKULI SEWERS SECTION I ID NO. 257"
D/W TO BEACH PARKING AREA
EXIST SMH #55 INV=(-)0.58
STA 0+00 POHAI INSTALL ST MON
220°25'30" 5590.64
(-)0+42.35 POHAI = POC 254+85.29 FAR.HWY.
220°25'44" 5,769.34
EXIST SMH #4
ULEHAWA BEACH PARK
EXIST. SPEED SIGN
EXIST PB
EDGE STRIPING
TO NANAKULI
BASELINE FARRINGTON HIGHWAY STATE PROJECT NO. 3008-02-68
FARRINGTON HIGHWAY
MON. TO ST. MON.
203.90 (ST.)
308°42'40" EDGE OF PAVT.
70' TYP. FROM CORNER TO POC
214°15'30" 42.25
STA 0+18
℄ 254+10.26
℄ 0+28.3± EXIST CB AA-1 TYPE "B" INV=4.80±
SUBDIVISION BOUNDARY
℄ 1+39.84 EXIST FIRE HYDRANT
EXIST CONC SIDEWALK
EXIST CONC CURB & GUTTER
EXIST 8"C.I. WATER CL. 150
EXIST 18"RCP CL III
EXIST "B" LAT
EXIST 12" V.C.SEWER
EXIST 12" LAT
EXIST 25± LF RCP JACKET
CAP 1-1/2"W
2"PVC CONDUIT SCH 80
CAP 1-1/2"(IRR)
EXIST 18"RCP INV=4.39±
EXIST UNLINED CHANNEL
℄ 3+85± EXIST 3/4" AIR RELIEF VALVE
℄ 4+10 MATCH LINE
214°15'30" 829.69 Mon to Mon
EXIST 8"C.I. WATER CL. 150
EXIST 12" V.C. SEWER
EXIST Conc S/W
TRANS EASM'T
℄2+99.61± POHAI
℄11+67.58 "U-2"
EXIST 48"RCP INV=4.68±
NEW 15' WIDE x 8' HIGH BOX CULVERT PLANS BOUND SEPARATELY "PRINCESS KAHANU ESTATES SUBDIVISION - CHANNEL U-2 BOX CULVERT"
RISER W/ CO INV.=9.10
C-1 LAT
PVC SEWER
PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 268,269,270,271,272 & 158
℄ 0+35± EXIST 6" LAT INV.=2.22±
EXIST CONC SIDEWALK
℄ 0+16.34 ℄ EXIST CB #P-1 TYPE "B" INV=5.37
℄ 255+10.27
℄ 255+19.21
℄ 0+00± ℄ EXIST SMH #4A INV=(-)1.14 (8") INV=(-)1.87 (12")
℄ 2+70± ℄ EXIST SMH #1-1 INV=(-)1.28±(12")
ROADWAY EASEMENT 56-FT WIDE TO BE GRANTED TO DHHL
1-1/2"RP BFP
1-1/2"DC BFP
1-1/2" GV
IRR
℄ 127.02' EXIST CHANNEL "U-2"
CITY R/W
LOT 273 IMPROVEMENTS PLANS BOUND SEPARATELY "PRINCESS KAHANU ESTATES SUBDIVISION PHASE I - POHAI STREET"
273
272
271

CURB RETURN DATA

(23)	(24)
△ = 96°49'30"	△ = 83°10'30"
△/2 = 48°24'45"	△/2 = 41°35'15"
R = 28.00	R = 28.00
C = 41.88	C = 37.17
T = 31.55	T = 24.85
L = 47.32	L = 40.65

℄ DATA

(23)	(24)
△ = 66°45'00"	△ = 83°10'30"
△/2 = 33°22'30"	△/2 = 41°35'15"
R = 30.00	R = 30.00
C = 33.01	C = 39.83
T = 19.76	T = 26.62
L = 34.95	L = 43.55

PLAN - POHAI STREET
SCALE: 1" = 20'

N.I.C.
PROFILE - POHAI STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

Grade Break 9.89
9.49
℄ 0+00
℄ 0+60
EXIST TOP OF CURB GRADE +1.10%
INV EXIST 8"C.I. WATER CL.150
INV.EXIST.18"RCP.CL.III
INV EXIST 12" SEWER @ 0.28%
INV.EXIST.12"SEWER 95.38 LF @ 0.28%
EXIST 8"W
FIRE HYDRANT
3/4"AIR RELIEF VALVE
C&C CHANNEL R/W
BVC 12.60
PIVC 13.15
EVC 12.95
100' V.C.
℄ 3+10
℄ 3+60
EXIST ARV
℄ 4+10
HGL
INV.EXIST.48" RCP.CL.III
INV 8" WATER
MATCH LINE ℄ 4+10
4+50
4+00
3+50
3+00
2+50
2+00
1+50
1+00
0+50
0+00
(-)0+50
(-)1+00
20
10
0
(-)10

Q_d = 0.52 MGD
Q_a = 1.06 MGD
V_a = 2.15 fps
V_A = 2.07 fps
n = 0.015
d_n = 0.50 ft

℄ STA.7+92.31± NANAKULI INTERCEPTOR SEWER SECTION 3
℄ EXISTING SMH #4 INV.=(-)2.02 (12") INV.=(-)8.56 (30") DROP MH
℄ 0+30± ℄ EXIST.CB #AA-1 INV.=4.80±
℄ 0+20± ℄ EXIST.CB & NEW CB #P-1 INV.=5.37±
℄ 0+00± ℄ EXIST.SMH #4A INV.=(-)1.14±(8") INV.=(-)1.87±(12")
℄ 2+70± ℄ EXIST.SMH #1-1 INV.=(-)1.28

APPROVED:
(FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEER NO. DPW 45, CITY & COUNTY OF HONOLULU — DATE 3/15/95

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

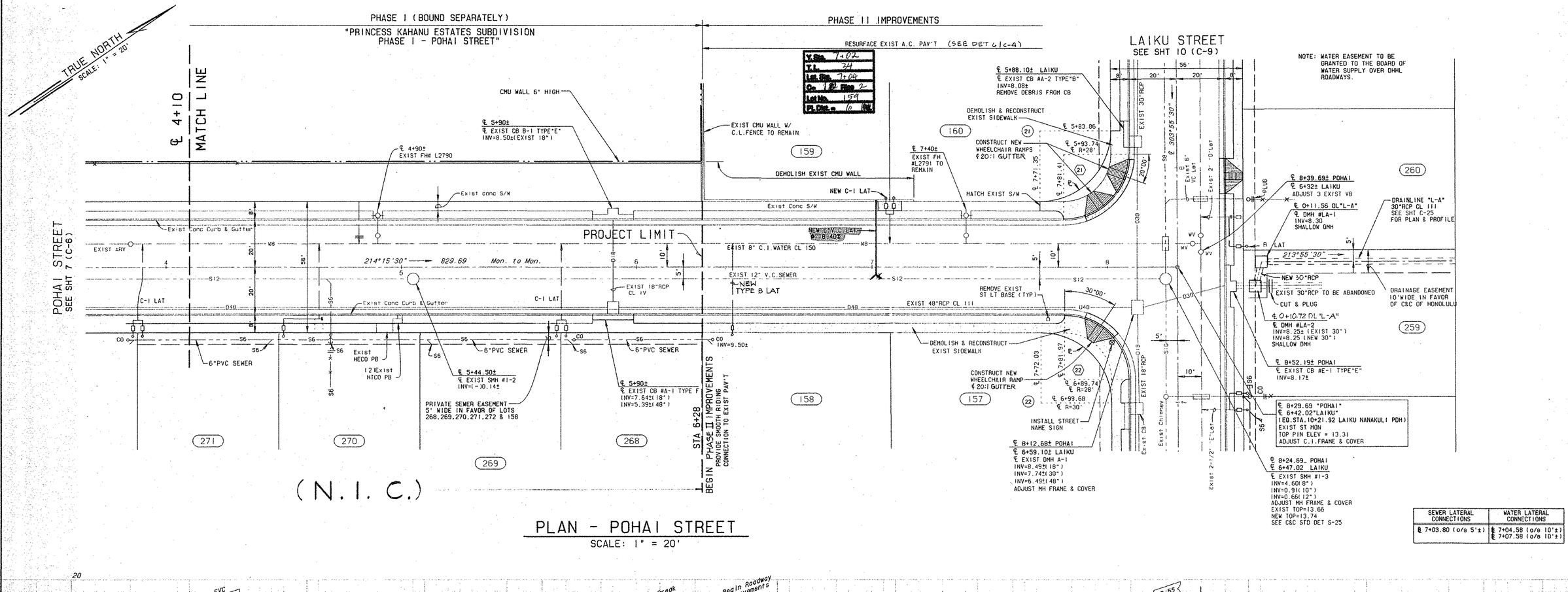
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
POHAI STREET

PROJECT NO.
DATE JULY 18, 1994
C-6

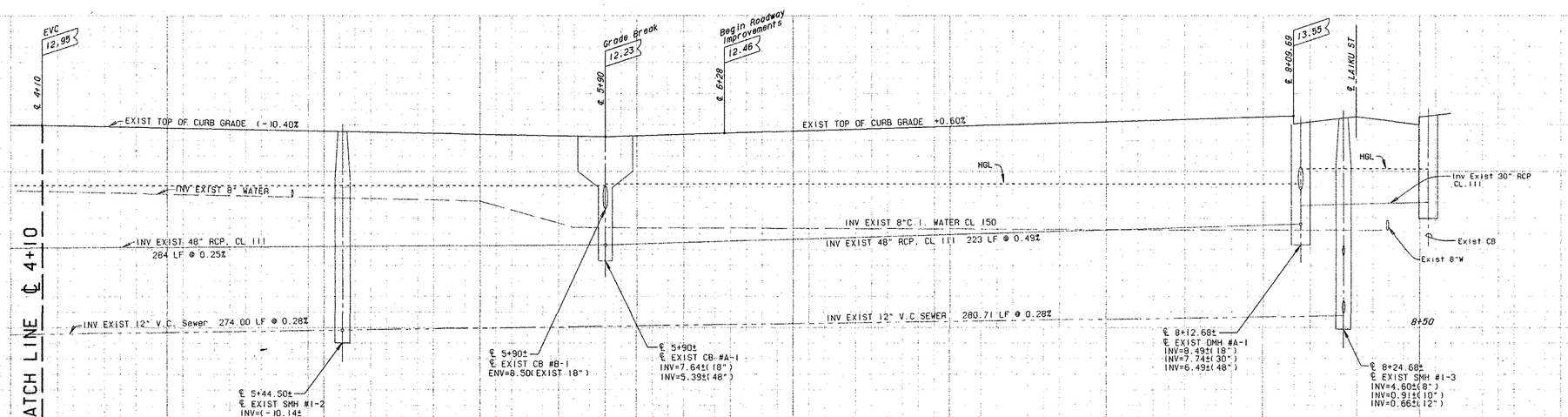
SHEET 7 OF 81 SHEETS

FILE	POCKET	FOLDER	NO.



SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
℄ 7+03.80 (o/s 5'±)	℄ 7+04.58 (o/s 10'±) ℄ 7+07.58 (o/s 10'±)

PLAN - POHAI STREET
SCALE: 1" = 20'



PROFILE - POHAI STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/6/94

APPROVED: (FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU — DATE 10/12/94

APPROVED: (FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DDH &C — DATE 12/15/95

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

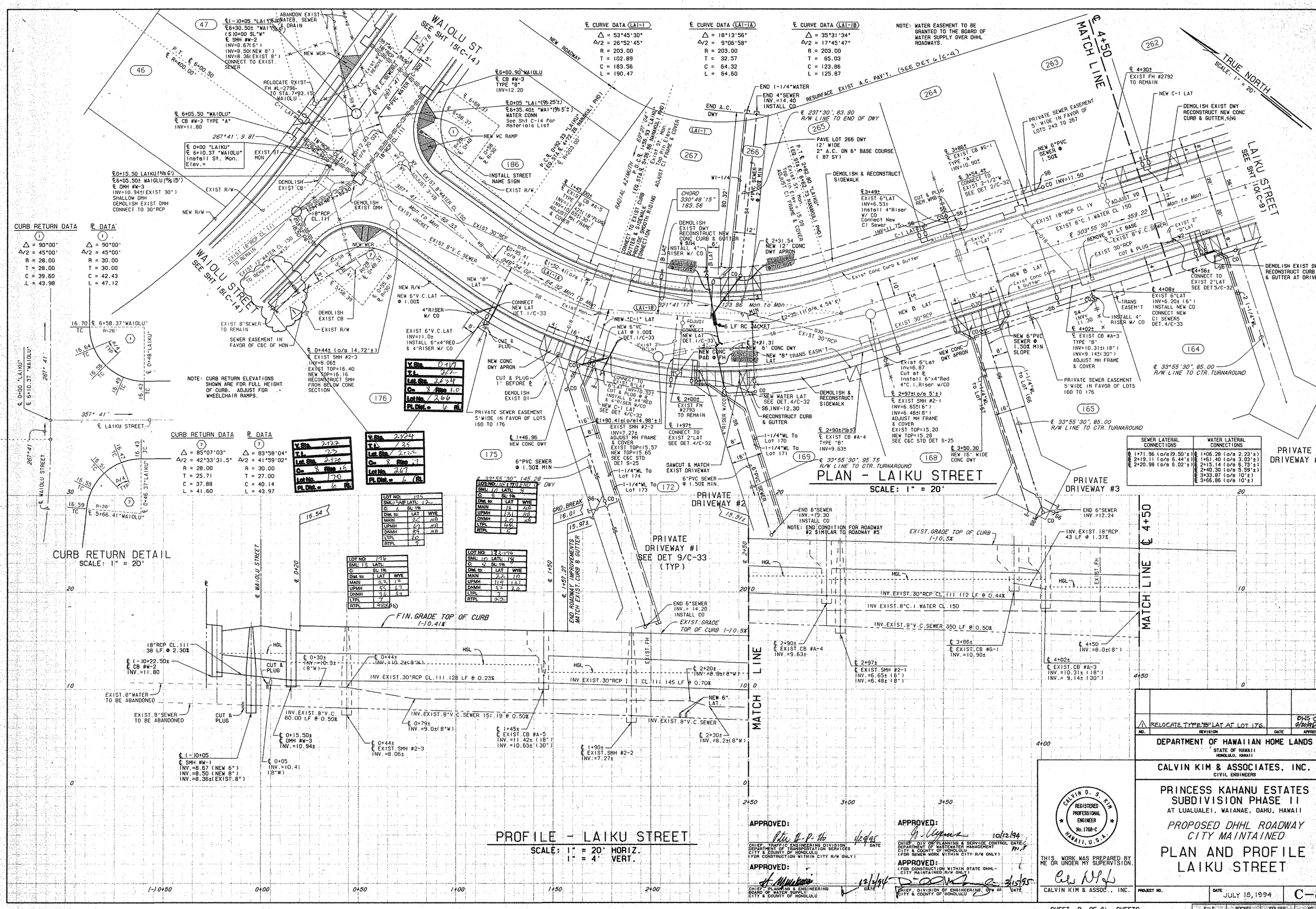
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE POHAI STREET

PROJECT NO. | DATE JULY 18, 1994 | C-7

SHEET 8 OF 81 SHEETS

FILE	POCKET	FOLDER	NO.


WAIOLU ST
SEE SHT 15(C-14)
LAIKU STREET
SEE SHT 10(C-9)
MATCH LINE
℄ 4+50
TRUE NORTH
SCALE: 1" = 20'
NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.
℄ CURVE DATA (LAI-1)
Δ = 53°45'30"
Δ/2 = 26°52'45"
R = 203.00
T = 102.89
C = 183.56
L = 190.47
℄ CURVE DATA (LAI-1A)
Δ = 18°13'56"
Δ/2 = 9°06'58"
R = 203.00
T = 32.57
C = 64.32
L = 64.60
℄ CURVE DATA (LAI-1B)
Δ = 35°31'34"
Δ/2 = 17°45'47"
R = 203.00
T = 65.03
C = 123.86
L = 125.87
CURB RETURN DATA
Δ = 90°00'
Δ/2 = 45°00'
R = 28.00
T = 28.00
C = 39.60
L = 43.98
℄ DATA
Δ = 90°00'
Δ/2 = 45°00'
R = 30.00
T = 30.00
C = 42.43
L = 47.12
CURB RETURN DATA
Δ = 85°07'03"
Δ/2 = 42°33'31.5"
R = 28.00
T = 25.71
C = 37.88
L = 41.60
℄ DATA
Δ = 83°58'04"
Δ/2 = 41°59'02"
R = 30.00
T = 27.00
C = 40.14
L = 43.97
CURB RETURN DETAIL
SCALE: 1" = 20'
NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.
PLAN - LAIKU STREET
SCALE: 1" = 20'
PROFILE - LAIKU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
PRIVATE DRIVEWAY #1 SEE DET 9/C-33 (TYP)
PRIVATE DRIVEWAY #2
PRIVATE DRIVEWAY #3
PRIVATE DRIVEWAY #4
PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 160 TO 176
PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 243 TO 267
SEWER EASEMENT IN FAVOR OF C&C OF HON
RESURFACE EXIST A.C. PAV'T. (SEE DET 6/C-4)
DEMOLISH EXIST DWY RECONSTRUCT NEW CONC CURB & GUTTER, S/W
DEMOLISH EXIST DWY RECONSTRUCT CURB & GUTTER AT DRIVEWAY
DEMOLISH & RECONSTRUCT SIDEWALK
PAVE LOT 266 DWY 12' WIDE 2" A.C. ON 6" BASE COURSE (87 SY)
INSTALL STREET NAME SIGN
EXIST R/W
NEW R/W
NEW WC RAMP
NEW CONC DWY APRON
NEW CONC PAD
NEW 6' CONC DWY
NEW 16' WIDE CONC DWY
RECONSTRUCT CURB & GUTTER
CUT & PLUG
SAWCUT & MATCH EXIST DRIVEWAY
NEW 6"V.C.LAT @ 1.00%
4"RISER W/ CO
NEW "B" LAT
NEW "B" TRANS EASM'T LAT
CONNECT NEW LAT DET. 1/C-33
NEW "C-1" LAT
NEW 6"VC LAT @ 1.00% DET. 1/C-33
NEW C-1 LAT SEE DET 4/C-32
NEW B LAT
NEW 6"PVC SEWER @ 1.50% MIN SLOPE
NEW 4"PVC SEWER @ 2.00% MIN
NEW WATER LAT SEE DET. 4/C-32
1-1/4"WL To Lot 170
1-1/4"WL To Lot 171
1-1/4"WL To Lot 174
1-1/4"WL To Lot 173
1-1/4"WL To Lot 169
1-1/4"WL To Lot 168
1-1/4"WL To Lot 165
6"PVC SEWER @ 1.50% MIN.
EXIST 6"V.C.LAT INV=11.0± INSTALL 6"x4"RED & 4"RISER W/ CO
EXIST 8"V.C SEWER
EXIST 8"WATER CL 150
EXIST 12"WATER CL 150 TO REMAIN
EXIST 18"RCP CL III TO REMAIN
EXIST 30"RCP
EXIST 8"SEWER TO REMAIN
EXIST 2"LAT
EXIST 6"LAT INV=6.20± (6") INSTALL NEW CO CONNECT NEW CI SEWERS DET. 4/C-33
EXIST 6"LAT INV=6.87 Cut at R Install 6"x4"Red 4"C.I.Riser w/CO
EXIST 6"LAT INV=6.53± Install 4"Riser W/ CO Connect New CI Sewer
EXIST CB #A-3 TYPE "B" INV=10.31± (18") INV=9.14± (30") ADJUST MH FRAME & COVER
EXIST CB #A-4 TYPE "B" INV=9.63±
EXIST CB #G-1 TYPE "A" INV=10.90±
EXIST SMH #2-1 INV=6.65±(6") INV=6.48±(8") ADJUST MH FRAME & COVER EXIST TOP=15.20 NEW TOP=15.28 SEE C&C STD DET S-25
EXIST SMH #2-2 INV=7.27± ADJUST MH FRAME & COVER EXIST TOP=15.65 NEW TOP=15.65 SEE C&C STD DET S-25
EXIST SMH #2-3 INV=8.06± EXIST TOP=16.40 NEW TOP=16.16 RECONSTRUCT SMH FROM BELOW CONE SECTION
EXIST CB #A-5 TYPE "B" 42"(18"PLUG) ADJUST MH FRAME & COVER
EXIST FH #2792 TO REMAIN
EXIST FH #2793 TO REMAIN
EXIST FH #2792 TO REMAIN
EXIST SMH #W-2 INV=8.67(6") (INV=8.50(NEW 8") INV=8.36(EXIST 8") CONNECT TO EXIST. SEWER
CB #W-3 TYPE "B" INV=12.20
CB #W-2 TYPE "A" INV=11.80
SMH #W-3 INV=10.94±(EXIST 30") SHALLOW DMH DEMOLISH EXIST DMH CONNECT TO 30"RCP
SMH #W-1 INV.=8.67 (NEW 6") INV.=8.50 (NEW 8") INV.=8.36±(EXIST 8")
DEMOLISH EXIST CB
DEMOLISH EXIST DMH
DEMOLISH EXIST DI
ABANDON EXIST WATER, SEWER & DRAIN
RELOCATE EXIST FH #L-2796 TO STA. 7+93.15 WAIOLU
INSTALL 4" RISER W/ CO
INSTALL 4" RISER W/ CO
INSTALL 6"x4"RED & 4"RISER W/CO
INSTALL 6"x4"RED & 4"RISER W/CO
CONNECT TO EXIST 2"LAT SEE DET. 4/C-32
CONNECT TO EXIST 2"LAT SEE DET. 4/C-32
CONNECT TO EXIST 2"LAT SEE DET 5/C-32
CONNECT TO EXIST 6"LAT CUT & PLUG @ R & 4"RISER W/CO
ADJUST W/V
ADJUST V.B
ADJUST 3"VB
ADJUST CI FRAME & COVER
ADJUST MH FRAME & COVER
ADJUST MH FRAME & COVER TO FINISH GRADE
CONNECT TO EXIST C&C SIDEWALK
CONNECT TO EXIST CURB & SIDEWALK
PROVIDE SMOOTH FINISH CONNECTION
REMOVE ST LT BASE
CUT & PLUG REM. WMB
CUT & PLUG EXIST 30"RCP
CUT & PLUG EXIST 8"V.C.SEWER
CUT & PLUG EXIST 8"WATER
CUT & PLUG EXIST 12"WATER
6 LF RC JACKET
END 4"SEWER INV.=14.40 INSTALL CO
END 6"SEWER INV.=13.30 INSTALL CO
END 6"SEWER INV.=14.20 INSTALL CO
END 6"SEWER INV.=12.24
END A.C. DWY
PAVE LOT 266 DWY 12' WIDE 2" A.C. ON 6" BASE COURSE (87 SY)
PAVE LOT 267 DWY 12' WIDE 2" A.C. ON 6" BASE COURSE (87 SY)
NOTE: END CONDITION FOR ROADWAY #2 SIMILAR TO ROADWAY #5
NEW ROADWAY
RADIAL AZIMUTH
CHORD 330°49'15" 183.56
P.T. ℄ R=400.00'
P.C. ℄ R=203.00'
P.T. ℄ R=203.00'
P.C. ℄ R=400.00'
℄ 237°30', 83.90 R/W LINE TO END OF DWY
℄ 33°55'30", 95.75 R/W LINE TO CTR. TURNAROUND
℄ 33°55'30", 85.00 R/W LINE TO CTR. TURNAROUND
℄ 33°55'30", 145.28 R/W LINE TO CTR. TURNAROUND
℄ 33°55'30", 85.00 R/W LINE TO CTR. TURNAROUND
℄ 267°41', 9.87
℄ 357°41', 22.32
℄ 357°41', 64.92 Mon to Mon
℄ 357°41', 123.86 Mon to Mon
℄ 357°41', 359.22 Mon to Mon
℄ 303°55'30", 359.22
℄ 267°41'
℄ 357°41'
℄ LAIKU STREET
℄ WAIOLU STREET
℄ 0+00 "LAIKU" ℄ 6+10.37 "WAIOLU" Install St. Mon. Elev.=
℄ 6+05.50 "WAIOLU" ℄ CB #W-2 TYPE "A" INV=11.80
℄ 6+60.90 "WAIOLU" ℄ CB #W-3 TYPE "B" INV=12.20
℄ 0+05 "LAI'(%25')" ℄ 6+35.40± "WAI'(%5')" WATER CONN See Sht C-14 for Materials List
℄ 0+00 "LAIKU" ℄ 6+05.50± WAIOLU (%15') ℄ DMH #W-3 INV=10.94±(EXIST 30") SHALLOW DMH DEMOLISH EXIST DMH CONNECT TO 30"RCP
℄ 0+00 "LAIKU" ℄ 6+10.37 "WAIOLU"
℄ 0+44± (o/s 14.72'±) ℄ EXIST SMH #2-3 INV=8.06± EXIST TOP=16.40 NEW TOP=16.16 RECONSTRUCT SMH FROM BELOW CONE SECTION
℄ 1+90.41±(o/s 14.98'±) EXIST SMH #2-2 INV=7.27± ADJUST MH FRAME & COVER EXIST TOP=15.57 NEW TOP=15.65 SEE C&C STD DET S-25
℄ 2+35.11(o/s 4.54'±)
℄ 2+90±(%5') ℄ EXIST CB #A-4 TYPE "B" INV=9.63±
℄ 3+50.30 NEW 16' WIDE CONC DWY
℄ 3+86± ℄ EXIST CB #G-1 TYPE "A" INV=10.90±
℄ 3+54.45± CONNECT TO EXIST 2-1/2"W SEE DET 2/C-32
℄ 4+02± ℄ EXIST CB #A-3 TYPE "B" INV=10.31±(18") INV=9.14±(30") ADJUST MH FRAME & COVER
℄ 4+08± EXIST 6"LAT INV=6.20± (6") INSTALL NEW CO CONNECT NEW CI SEWERS DET. 4/C-33
℄ 4+30± EXIST FH #2792 TO REMAIN
℄ 4+56± CONNECT TO EXIST 2"LAT SEE DET 5/C-32
℄ 2+97± (o/s 5'±) ℄ EXIST SMH #2-1 INV=6.65±(6") INV=6.48±(8") ADJUST MH FRAME & COVER EXIST TOP=15.20 NEW TOP=15.28 SEE C&C STD DET S-25
℄ 1+46.96 NEW CONC DWY
℄ 2+00± EXIST FH #2793 TO REMAIN
℄ 1+97± CONNECT TO EXIST 2"LAT SEE DET. 4/C-32
℄ 2+31.54 NEW 12' CONC DWY APRON
℄ 1+52.41(o/s 1'±)
℄ 1+45.00± EXIST CB #A-5 TYPE "B" 42"(18"PLUG) ADJUST MH FRAME & COVER
℄ 0+58.37 "WAIOLU"
℄ 0+48 "LAIKU"
℄ 5+66.41 "WAIOLU"
P.T. ℄ R=400.00'
P.C. ℄ R=203.00'
P.T. ℄ R=203.00'
P.C. ℄ R=400.00'
P.C. ℄ 0+92.33 "LAIKU" (EQ. STA. ℄ 4+72.26 NAMAKUL PHD)
P.T. ℄ 2+82.80 "LAIKU" (EQ. STA. ℄ 6+62.73 NAMAKUL PHD)
RADIAL AZIMUTH 69°27'04" ℄ 1+65.93 "LAIKU" (EQ. STA. ℄ 5+36.85 NAMAKUL PHD)
EXIST ST. Mon. ON EXIST PIN & CAP
ADJUST CI FRAME & COVER
EXIST 18"RCP CL III
EXIST 18"RCP CL IV
EXIST 8"C.I WATER CL 150
EXIST 6"C.I WATER CL 150
EXIST 8"V.C SEWER
EXIST 6"V.C SEWER
EXIST 2"LAT
EXIST 2-1/2"LAT
EXIST 2-1/2"LAT
EXIST 2-1/2"LAT
EXIST 2"LAT
EXIST 2"LAT
EXIST 6"LAT
EXIST 6"LAT
EXIST 6

RESURFACE EXIST. A.C. PAV'T. (SEE DET 6/C-4)

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

℄ 4+50 MATCH LINE

℄ 9+50 MATCH LINE

TRUE NORTH SCALE: 1" = 20'

LAIKU STREET
SEE SHEET 9 (C-8)

LAIKU STREET
SEE SHEET 11 (C-10)

POHAI STREET
SEE SHEET 8 (C-7)

SEWER EASEMENT 6' WIDE IN FAVOR OF C&C OF HONOLULU

DRAINAGE EASEMENT 10' WIDE IN FAVOR OF C&C OF HONOLULU

PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 243 TO 267

PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 160 TO 176

PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 132 TO 157

WATER LATERAL CONNECTIONS

℄ 4+58.99	(o/s 10'±)
℄ 5+52.42	(o/s 10'±)
℄ 5+73.37	(o/s 10'±)
℄ 7+32.41	(o/s 10'±)
℄ 8+18.12	(o/s 10'±)
℄ 9+15.35	(o/s 10'±)
℄ 9+48.41	(o/s 10'±)

CURB RETURN DATA (EXIST)

(21)	(22)
△ = 90°20'00"	△ = 89°40'00"
△/2 = 45°10'00"	△/2 = 44°50'00"
R = 28.00	R = 28.00
T = 28.16	T = 27.84
C = 39.71	C = 39.48
L = 44.15	L = 43.82

℄ DATA

(21)	(22)
△ = 90°20'00"	△ = 89°40'00"
△/2 = 45°10'00"	△/2 = 44°50'00"
R = 30.00	R = 30.00
T = 30.18	T = 29.83
C = 42.55	C = 42.30
L = 47.30	L = 46.95

PLAN - LAIKU STREET
SCALE: 1" = 20'

PROFILE - LAIKU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

APPROVED:
Peter H. P. Ho 1/24/95
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY)

APPROVED:
H. Nakamura 12/15/94
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU

APPROVED:
G. Ueyama 10/12/94
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY)

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
D. Takamine for 3/15/95
CHIEF, DIVISION OF ENGINEERING, DPW, GS DATE

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 7768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

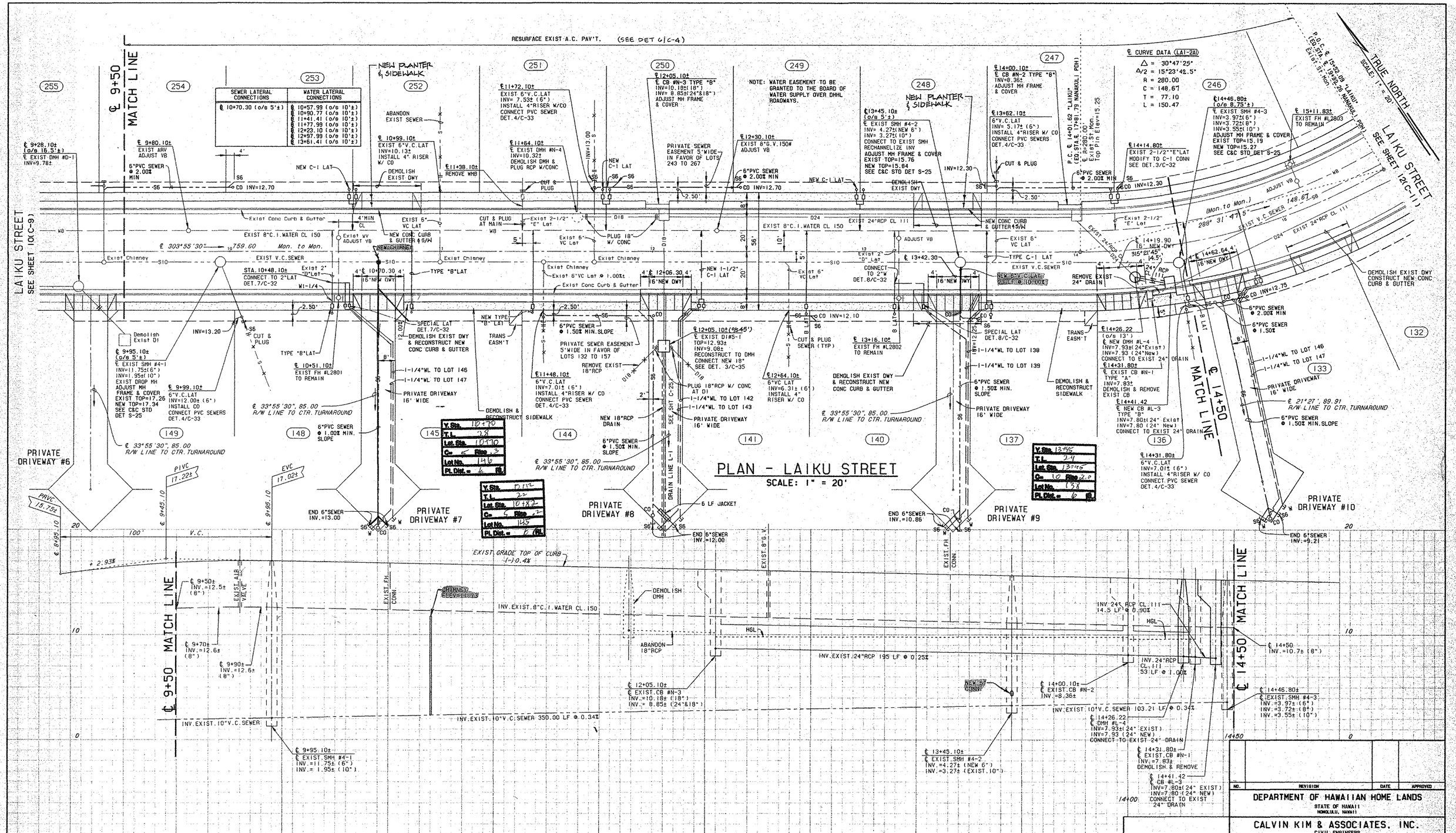
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
LAIKU STREET

PROJECT NO. | DATE JULY 18, 1994 | C-9

SHEET 10 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.


RESURFACE EXIST. A.C. PAV'T. (SEE DET 6/C-4)
℄ 9+50 MATCH LINE
LAIKU STREET
SEE SHEET 10(C-9)
SEWER LATERAL CONNECTIONS
WATER LATERAL CONNECTIONS
℄ 10+70.30 (o/s 5'±)
@ 10+57.99 (o/s 10'±)
@ 10+90.77 (o/s 10'±)
@ 11+41.41 (o/s 10'±)
@ 11+77.99 (o/s 10'±)
@ 12+29.10 (o/s 10'±)
@ 12+97.99 (o/s 10'±)
@ 13+61.41 (o/s 10'±)
NEW PLANTER & SIDEWALK
ABANDON EXIST SEWER
DEMOLISH EXIST DWY
NEW C-1 LAT
EXIST 6" VC LAT
NEW CONC CURB & GUTTER @ S/W
EXIST V.C.SEWER
EXIST 8"C.I.WATER CL 150
Exist Conc Curb & Gutter
Exist Chimney
TYPE "B"LAT
TYPE C-1 LAT
CUT & PLUG
CUT & PLUG AT MAIN
Exist 2-1/2" "E" Lat
Exist 2" "D" Lat
PLUG 18" W/ CONC
DEMOLISH EXIST DWY & RECONSTRUCT NEW CONC CURB & GUTTER
DEMOLISH & RECONSTRUCT SIDEWALK
TRANS EASM'T
PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 132 TO 157
PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 243 TO 267
REMOVE EXIST 18"RCP
REMOVE EXIST 24" DRAIN
NEW 18"RCP DRAIN
CONNECT TO 2"W DET.8/C-32
SPECIAL LAT DET.3/C-32
CUT & PLUG SEWER (TYP)
DEMOLISH & RECONSTRUCT SIDEWALK
NEW 6"VC LAT
NEW 1-1/2" C-1 LAT
NEW TYPE "B" LAT
ADJUST VB
ADJUST MH FRAME & COVER
EXIST FH #L2803 TO REMAIN
EXIST FH #L2802 TO REMAIN
EXIST 24"RCP CL III
EXIST 8"G.V.150#
EXIST 8"C.I.WATER CL 150
EXIST 8"V.C.
EXIST 6"V.C.
EXIST 10"V.C.
EXIST 24"RCP
EXIST 2-1/2"*E"LAT MODIFY TO C-1 CONN SEE DET.3/C-32
EXIST SMH #4-3 INV=3.97±(6") INV=3.72±(8") INV=3.55±(10") ADJUST MH FRAME & COVER EXIST TOP=15.19 NEW TOP=15.27 SEE C&C STD DET S-25
EXIST SMH #4-2 INV= 4.27±(NEW 6") INV= 3.27±(10") CONNECT TO EXIST SMH RECHANNELIZE INV ADJUST MH FRAME & COVER EXIST TOP=15.76 NEW TOP=15.84 SEE C&C STD DET S-25
EXIST CB #N-2 TYPE "B" INV=8.36± ADJUST MH FRAME & COVER
EXIST CB #N-3 TYPE "B" INV=10.18±(18") INV= 8.85±(24"&18") ADJUST MH FRAME & COVER
EXIST DMH #N-4 INV=10.32± DEMOLISH DMH & PLUG RCP W/CONC
EXIST CB #S-1 TOP=12.93± INV=9.08± RECONSTRUCT TO DMH CONNECT NEW 18" SEE DET. 3/C-35
EXIST DI #S-1 TOP=12.93± INV=9.08± DEMOLISH EXIST DI
EXIST SMH #4-1 INV=11.75±(6") INV=11.95±(10") EXIST DROP MH ADJUST MH FRAME & COVER EXIST TOP=17.26 NEW TOP=17.34 SEE C&C STD DET S-25
NEW CB #L-3 TYPE "B" INV=7.80±(24" Exist) INV=7.80±(24" New) CONNECT TO EXIST 24" DRAIN
NEW DMH #L-4 INV=7.93±(24"EXIST) INV=7.93 (24" NEW) CONNECT TO EXIST 24" DRAIN
EXIST CB #N-1 TYPE "A" INV=7.83± DEMOLISH & REMOVE EXIST CB
6"V.C.LAT INV=11.75±(6") INSTALL 4"RISER W/ CO CONNECT PVC SEWER DET.4/C-33
6"V.C.LAT INV=10.13± INSTALL 4" RISER W/ CO
6"V.C.LAT INV=7.01± INSTALL 4"RISER W/ CO CONNECT PVC SEWER DET.4/C-33
6"V.C.LAT INV=6.31± (6") INSTALL 4" RISER W/ CO
6"V.C.LAT INV= 5.17± (6") INSTALL 4"RISER W/ CO CONNECT PVC SEWERS DET.4/C-33
6"PVC SEWER @ 2.00% MIN
6"PVC SEWER @ 1.50% MIN.SLOPE
6"PVC SEWER @ 1.00% MIN. SLOPE
1-1/4"WL TO LOT 138
1-1/4"WL TO LOT 139
1-1/4"WL TO LOT 146
1-1/4"WL TO LOT 147
1-1/4"WL TO LOT 142
1-1/4"WL TO LOT 143
PRIVATE DRIVEWAY 16' WIDE
℄ 33°55'30", 85.00 R/W LINE TO CTR. TURNAROUND
℄ 21°27', 89.91 R/W LINE TO CTR. TURNAROUND
℄ 303°55'30" 759.60 Mon. to Mon.
℄ 288° 31' 47.5" 148.67 SB (Mon. to Mon.)
CURVE DATA (LAI-2A)
△ = 30°47'25"
△/2 = 15°23'42.5"
R = 280.00
C = 148.67
T = 77.10
L = 150.47
P.C. ℄ 14+01.62 "LAIKU" (CEO STA.℄ 17+81.79 NANAKULI PDH)
P.R.C. STA.℄ 15+52.09 "LAIKU" (CEO STA.℄ 15+92.28 NANAKULI PDH)
Exist 8"C.I. Mon. Top Flr. Elev=15.25
Exist 24"RCP CL III
Exist 8"G.V.
Exist FH CONN.
Exist Chimney
Exist Conc Curb & Gutter
Exist WV ADJUST VB
Exist 6" VC Lat
Exist 6"VC Lat @ 1.00±
Exist 2" "D" Lat
Exist V.C.SEWER
Exist Chimney
Exist Conc Curb & Gutter
Exist 6" VC Lat
Exist 2-1/2" "E" Lat
Exist 24"RCP CL III
Exist 24"RCP
Exist 8"C.I.WATER CL 150
Exist 8"V.C.
Exist 6"V.C.
Exist 10"V.C.
Exist FH CONN.
Exist Chimney
Exist Conc Curb & Gutter
Exist Chimney
Exist Chimney
Exist Chimney

RESURFACE EXIST A.C. PAVEMENT (SEE DET 6/C-9)

TRUE NORTH SCALE: 1" = 20'

LAIKU STREET SEE SHT 11(C-10)

℄ 14+50 MATCH LINE

WAIOLU STREET SEE SHEET 18(C-17)

℄ 19+50 MATCH LINE

LAIKU STREET SEE SHEET 13(C-12)

PRIVATE DRIVEWAY SEE SHT C-10

ROAD "F" SEE SHT 24(C-23)

ROAD "G" SEE SHT 24(C-23)

(OVERALL P.C.TO P.T.)
℄ CURVE DATA (LAI-2)
Δ = 61°34'50"
Δ/2 = 30°47'25"
R = 280.00
T = 166.65
C = 286.66
L = 300.94

℄ CURVE DATA (LAI-2A)
Δ = 43°31'30"
Δ/2 = 21°45'46"
R = 280.00
T = 111.78
C = 207.63
L = 212.70

℄ CURVE DATA (LAI-2A1)
Δ = 30°47'25"
Δ/2 = 15°23'42.5"
R = 280.00
T = 77.10
C = 148.67
L = 150.47

℄ CURVE DATA (LAI-2A2)
Δ = 12°44'05"
Δ/2 = 6°22'02.5"
R = 280.00
T = 31.25
C = 62.11
L = 62.23

℄ CURVE DATA (LAI-2B)
Δ = 18°03'20"
Δ/2 = 9°01'40"
R = 280.00
T = 44.49
C = 87.87
L = 88.24

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS:

WATER CONN
1-8"x 8"Tee
2-8"Sleeve 12"Long
3-8"GV 150#
3-Valve Boxes
1-Conc Block w/Struct.Strut
20 LF 8"PVC Pipe, CL 150
2-SLF 8"PVC PIPE FOR ISOLATION
TEMP FOR TESTING
1 2-1/2"Cleanout w/8" MJ Cap
1-Conc Block

CHORD: 282°09'45", 297.63 (P.C.to Int'rs.)

CHORD: 288°31'47.5", 148.67 (P.C.to Mon.)

CHORD: 266°46'025", 62.11 (Mon.to Int'rs.)

RADIAL AZ. = 369°08'05"

RADIAL AZ = 360°24'

RADIAL AZ = 342° 11' 00"

℄ 21°27' : 89.91 R/W LINE TO CTR. TURNAROUND

P.C.℄ 14+01.62 "LAIKU" (EQ.STA.℄ 17+81.79 NANAKULI PDH)
EXIST 8"DIP TO BE REMOVED
TOP PIN ELEV.= EXIST MH FRAME & COVER
ADJUST MH FRAME & COVER

P.C.℄ 17+40.56 "LAIKU" (EQ.STA.℄ 17+82.12 NANAKULI PDH)
EXIST 8"DIP TO BE REMOVED
TOP PIN ELEV.= EXIST MH FRAME & COVER
ADJUST CI FRAME & COVER

P.C.℄ 19+71.45 "LAIKU" (EQ.STA.℄ 23+51.50 NANAKULI PDH)
EXIST 8"DIP TO BE REMOVED
TOP PIN ELEV.= EXIST MH FRAME & COVER
ADJUST MH FRAME & COVER

P.O.C.℄ 16+14.32 "LAIKU"
℄ R = 280.00'
EXIST 8"DIP TO BE REMOVED
TOP PIN ELEV.= EXIST MH FRAME & COVER
ADJUST CI FRAME & COVER

P.O.C.℄ 16+14.32 "LAIKU"
℄ R = 280.00'
RADIAL AZ = 360°24'

P.O.C.℄ 16+14.32 "LAIKU"
℄ R = 280.00'
RADIAL AZ = 369°08'05"

P.O.C.℄ 16+14.32 "LAIKU"
℄ R = 280.00'
RADIAL AZ = 342° 11' 00"

P.O.C.℄ 19+61.45 "LAIKU"
℄ DMH #L-2 SPECIAL TYPE"W"
INV=8.20 (18")
INV=7.10 (36")
DET.2/C-36

P.O.℄ 16+14.32 "LAIKU"
℄ 0+00 RD."F"
INSTALL NEW ST. MON.

P.C.℄ 19+71.45 "LAIKU"
℄ 0+00 RD."G"
INSTALL ST.MON.
ELEV.=

PRIVATE SEWER EASEMENT
5' WIDE IN FAVOR OF LOTS 243 TO 267

SIGHT DISTANCE SETBACK LINE

CONSTRUCT NEW WHEELCHAIR RAMPS

DEMOLISH EXIST CB

DEMOLISH & RECONSTRUCT EXIST SIDEWALK

NEW TYPE "B"LAT

INSTALL 4" RISER W/ CO

NEW C-1 LAT

NEW "B"LAT

NEW "C" LAT

DEMOLISH EXIST DWY
CONSTRUCT NEW CONC CURB & GUTTER ℄ S/W

INSTALL 4" RISER W/ CO TYP ALL LAT

DEMOLISH & RECONSTRUCT SIDEWALK

MODIFY TO "B"LAT DET 3/C-32

RECONSTRUCT CONC CURB & GUTTER

NEW CONC THRU-GUTTER

DEMOLISH & RECONSTRUCT SIDEWALK

DEMOLISH & RECONSTRUCT SIDEWALK

CUT & PLUG 18"RCP

Install ST Name Sign

Remove Exist 18"RCP

10 LF RC JACKET

NEW 18"RCP CL III 8 LF @ 7.50%

CUT & PLUG AT TEE

ADJUST VB

INSTALL STREET NAME SIGN

DEMOLISH EXIST DWY
RECONSTRUCT NEW CURB & GUTTER ℄ S/W

DEMOLISH & REMOVE EXIST CURB, GUTTER & SIDEWALK
CONSTRUCT NEW IMPROVEMENTS

RELOCATE EXIST FH #L2805 TO ℄ 18+93.80
REMOVE & SALVAGE EXIST GV & VB FRAME & COVER
1-6" PLUG
1-CONC BLOCK
1-6" HUB CLAMP W/ STRONG BACK

DEMOLISH EXIST CURB, GUTTER, SIDEWALK & DRIVEWAY
RECONSTRUCT IMPROVEMENTS SHOWN

INSTALL STREET NAME SIGN
PROVIDE SMOOTH RIDING CONNECTION

MATCH EXIST CURB & GUTTER

MATCH EXIST CURB & GUTTER AND CURB

ABANDON EXIST 30"RCP

EXIST 18"RCP TO BE ABANDONED (TYP.)

CUT & PLUG EXIST SEWER TO BE ABANDONED (TYP.)

NEW 6"V.C.LAT @ 20.00% 4" RISER W/ CO

NEW 6"V.C.LAT @ 20.00% 4" RISER W/ CO

NEW 6"V.C.LAT @ 11.00% 4" RISER W/ CO

EXIST 6"V.C LAT @ 11.00%

EXIST 6"V.C LAT

EXIST 6"V.C LAT @ 20.00%

EXIST 6"V.C LAT @ 11.00%

TRUE NORTH
SCALE: 1" = 20'

℄ 19+50 MATCH LINE

LAIKU STREET
SEE SHT 12(C-11)

ROAD "G"
SEE SHT 24(C-23)

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

℄ CURVE DATA (LAI-3)

Δ = 21°15'
Δ/2 = 10°37'30"
R = 500.00
T = 93.80
C = 184.38
L = 185.44

RADIAL TO P.T. ℄ 21+56.89 "LAIKU" = 91°05'40"
INSTEAD NEW ST. MON. ELEV.=

CURB RETURN DATA

①	③
Δ = 90°00'	Δ = 85°36'16"
Δ/2 = 45°00'	Δ/2 = 42°48'08"
R = 28.00	R = 28.00
T = 28.00	T = 25.93
C = 39.60	C = 38.05
L = 43.98	L = 41.83

℄ CURVE DATA

①	③
Δ = 90°00'	Δ = 84°39'10"
Δ/2 = 45°00'	Δ/2 = 42°19'35"
R = 30.00	R = 30.00
T = 30.00	T = 27.32
C = 42.43	C = 40.40
L = 47.12	L = 44.32

CURB RETURN DATA

④	⑤
Δ = 49°14'55"	Δ = 222°06'53"
Δ/2 = 24°37'27.5"	Δ/2 = 111°03'26.5"
R = 48.00	R = 32.00
T = 22.00	C = 59.73
C = 40.00	L = 124.05
L = 41.26	

CURB RETURN DATA

⑤
Δ = 222°06'53"
Δ/2 = 111°03'26.5"
R = 32.00
C = 59.73
L = 124.05
Δ/10 = 22°12'41.3"

CURB RETURN DATA

④
Δ = 49°14'55"
Δ/2 = 24°37'27.5"
R = 48.00
T = 22.00
C = 40.00
L = 41.26

TURNAROUND DETAIL
SCALE: 1" = 20'

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
℄ 20+10 (o/s 6.39'±)	℄ 20+49.48 (o/s 6.41'±)
℄ 20+91.34 (o/s 9.82'±)	℄ 20+97.03 (o/s 7.83'±)
℄ 21+10.15 (o/s 8.40'±)	℄ 21+49.80 (o/s 11.18'±)
℄ 21+12.21 (o/s 8.15'±)	℄ 21+56.59 (o/s 11.37'±)
	℄ 21+60.59 (o/s 11.37'±)

PLAN - LAIKU STREET
SCALE: 1" = 20'

PROFILE - LAIKU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/20/95

APPROVED:
CHIEF ENGINEER, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/1/94

APPROVED:
CHIEF, DIV. OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL CITY MAINTAINED R/W & MAIN CONNECTION ONLY)
CHIEF, DIVISION OF ENGINEERING, DPH &S, CITY & COUNTY OF HONOLULU — DATE 9/15/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
LAIKU STREET

PROJECT NO.
DATE JULY 18, 1994
C-12

FILE | POCKET | FOLDER | NO.

SHEET 13 OF 81 SHEETS

TRUE NORTH
SCALE: 1" = 20'

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

ROAD "B"
SEE SHT 21 (C-20)

HAKIMO ROAD (CITY)

TO FARRINGTON HIGHWAY

ROADWAY LOT

EXIST ROAD TO REMAIN
RESURFACE EXIST A.C. PAV'T. (SEE DET 1/C-4)

EXIST ROAD IMPROVEMENTS TO BE DEMOLISHED AND RECONSTRUCTED TO THE NEW ALIGNMENT
SCARIFY & REMOVE EXIST A.C.PAV'T.

SIGHT LINE

NEW CONC S/W 4" THICK

INSTALL NEW ST NAME SIGN

SLOPE 1/4"PER FT

REMOVE EXIST W/CR

Exist W/C Ramp to Remain

℄ 0+00 "WAIOLU"
EQ.STA.℄ 6+26.39
(NANAKULI PLANNED DEV.HOUSING)

CUT & PLUG AT MAIN

Exist St Mon

LIMIT OF RESURFACING
PROVIDE SMOOTH RIDING CONNECTION

Exist Conc Curb & Gutter

Exist Conc S/W

EXIST 18"RCP CL III

EXIST 12"C.I. WATER CL 150

ADJUST VB

REMOVE EXIST ST.MON.

Exist W/C Ramp to Remain

Exist Lt. Pole Base (Demolish)

NEW CONC S/W 4" THICK

Exist 6" VC LAT

BWS
BOOSTER PUMP STATION

℄ 0+51.39
℄ EXIST CB #A-8
TYPE "B"
INV=44.99±

℄ 1+79.80 "WAIOLU"
(EQ.STA.℄ 4+52.59 NANAKULI PDH)
BEGIN NEW IMPROVEMENTS (PHASE II)
MATCH EXIST CURB, GUTTER & S/W
PROVIDE SMOOTH RIDING CONNECTION

P.C.℄ 1+93.80 "WAIOLU"
℄ R=400.00' ON
Install ST. Mon.
ELEV.=

℄ 2+69.40
℄ CB #W-16
TYPE "A"
INV=22.00
W/ DEFLECTOR INLET

℄ 2+69.43±(o/s 9.20'±)
℄ EXIST DMH #A-4
INV=21.33±
ADJUST MH FRAME & COVER
CONNECT TO EXIST DMH
SEE DET. 3/C-34

℄ 3+24.50 (o/s 15')
℄ NEW DMH #W-1
INV=18.00
SHALLOW DMH

18" RCP CL III
8.5LF @ 7.88%

℄3+45.68
REMOVE EXIST ST.MON.

℄4+09.39±
CUT & PLUG W5 AT TEE
1-6"PLUG
1-CONC BLOCK
1-6"HUB CLAMP
W/ STRONG BACK

℄4+07.39±
MODIFY EXIST CB #A-7
INV=14.04±
(18"FROM CB #W-1)
INV=13.19±
ADJUST MH FRAME & COVER
SEE DET 2/C-37

℄4+21.59(%&%)
WATER CONN
SEE SHT 22 FOR MATERIALS LIST

CP TEST

ANODE

℄ 4+26.20 "WAIOLU"
℄ 0+00 RD."C"
Inst'l St.Mon.
ELEV.=

℄ 4+71.71 MATCH LINE

℄ 4+55.40
℄ NEW W/C RAMP

EXTEND 8"VC LAT 5 LF AT SAME ALIGNMENT & GRADE
DET 2/C-33
INSTALL 4"RISER W/ CO
STA 4+60.39±
EXIST 6"LAT
INV=9.50±

WAIOLU STREET
SEE SHEET 15 (C-14)

EXIST 18"RCP

280° 10' 12.92 D18

EXIST 8"V.C.SEWER

EXIST R/W

NEW R/W

INSTALL STREET NAME SIGN

℄4+71.71

NEW W/CR

℄4+83.79

R=28'
℄0+46.03
R=30'
℄0+55.04

177

℄ 4+31.20 "WAIOLU"(o/s10.50'±)
℄ NEW SMH #C-1
INV=9.19±
CONNECT TO EXIST 8"SEWER
RECHANNELIZE SMH INV.

℄0+53.03 RD "C"
RELOCATED FH#L2794
SEE SHT. C-21

ROAD "C"
SEE SHEET 22(C-21)

EXIST 18"RCP CL III

EXIST 8"V.C.SEWER

CUT & PLUG EXIST S6

REMOVE & SALVAGE 6"GV & VB

EXIST "C"LAT

WAI-1A

306°32'55" 30.0
18"RCP CL III

℄3+81.39±
(o/s 14.70'±)
℄ EXIST SMH #3-1
INV=11.69±
INV=9.89±
SHALLOW DROP
EXIST TOP=19.59
NEW TOP=19.33
RECONSTRUCT SMH FROM BELOW CONE SECTION

℄3+54.50
DEMOLISH EXIST CB #W-1
CONSTRUCT NEW CB #W-1
TYPE "B"
INV=16.37±(EXIST 18"),INV=16.37(NEW 18");
CONNECT TO EXIST 18" DRAIN
W/DEFLECTOR INLET

℄4+09.39±
RELOCATE FH#L2794
TO℄0+53.03 RD"C"

℄0+53.03
CONC.THRU-GUTTER
SEE DPW STD.DET. SHT.R-8

℄3+86.64

℄3+86.64

℄3+24.50
℄ NEW D.I.#W-1
TYPE "Y-2"
INV=18.50

NEW CONC DITCH #W-1

DRAINAGE DITCH EASEMENT
5' WIDE IN FAVOR OF LOTS 182,183 & 184

18"RCP CL.III
15 LF @ 3.33%
2°05'57"

℄2+85.36±
EXIST TYPE "D"LAT
ADJUST WMB & VB

EXTEND EXIST VC LAT 3 LF±
INSTALL 4" RISER W/ CO

℄1+96.39±(o/s 14.45'±)
℄ EXIST SMH #3-2
INV=28.36±(6")
INV=28.19±(8")
EXIST TOP=34.29
NEW TOP=34.23
RECONSTRUCT SMH FROM BELOW CONE SECTION

℄2+71.79±
(o/s 2.20'±)

℄2+40±
(o/s 1.75'±)

℄1+77.39±
EXIST FH #L2795
TO REMAIN

℄1+82.39±
EXIST FH #L2794
TO REMAIN

LOT NO:	185		
SML:	NO	LAT℄	2.0
℄:	0	SL: 1%	
Dist. to:	LAT	WYE	
MAIN	2.5	NA	
UPMH	8.7	NA	
DNMH	10.3	NA	
LTPL	9.2		
RTPL	2.3		

LOT NO:			
SML:		LAT℄	
℄:	0	SL: 1%	
Dist. to:	LAT	WYE	
MAIN			
UPMH			
DNMH			
LTPL			
RTPL			

LOT NO:	45		
SML:	NO	LAT℄	9.0
℄:	0	SL: 1%	
Dist. to:	LAT	WYE	
MAIN	4.0	NA	
UPMH	2.3	NA	
DNMH	10.3	NA	
LTPL	9		
RTPL	5.2		

CURB RETURN DATA (26)
△ = 100°38'40"
△/2 = 50°19'20"
R = 28.00
T = 33.75
C = 43.10
L = 49.18

℄ DATA (26)
△ = 56°32'24"
△/2 = 28°16'12"
R = 30.00
T = 16.13
C = 28.42
L = 29.60

CURB RETURN DATA (25)
△ = 62°16'50"
△/2 = 31°08'25"
R = 28.00
T = 16.92
C = 28.96
L = 30.44

℄ DATA (25)
△ = 70°56'27"
△/2 = 35°28'13.5"
R = 30.00
T = 21.38
C = 34.82
L = 37.14

CURB RETURN DATA (6)
△ = 84°37'14"
△/2 = 42°18'37"
R = 28.00
T = 25.49
C = 37.70
L = 41.35

℄ DATA (6)
△ = 83°28'51"
△/2 = 41°44'25.5"
R = 30.00
T = 26.77
C = 39.95
L = 43.71

℄ CURVE DATA (WAI-1)
△ = 58°15'20"
△/2 = 29°07'40"
R = 400.00
T = 222.89
C = 389.41
L = 406.70

℄ CURVE DATA (WAI-1A)
△ = 33°17'20"
△/2 = 16°38'40"
R = 400.00
T = 119.58
C = 229.15
L = 232.40

℄ CURVE DATA (WAI-1B)
△ = 24°58'
△/2 = 12°29'
R = 400.00
T = 88.56
C = 172.92
L = 174.30

PLAN - WAIOLU STREET
SCALE: 1" = 20'

PROFILE - WAIOLU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

EXIST. GRADE TOP OF CURB
(-) 5.00%

(-) 12.00%

(-) 0.50%

FIN. GRADE TOP OF CURB

BEGIN ROADWAY IMPROVEMENTS
℄ 1+73.80
℄ 1+76.39

EXIST. FH

HGL

℄ 0+00
℄ 0+26.39
℄ 1+01.39
℄ 1+80
℄ 2+50 MATCH LINE
℄ 3+35
℄ 4+00 MATCH LINE
℄ 4+71.71 MATCH LINE
℄ 4+80

50.90±
BVC 49.63±
PIVC 45.88±
150' V.C.
EVC 37.19±
36.88
BVC 36.45
PIVC 17.85
310' V.C.
EVC 16.96
GRADE CHANGE
(310' V.C.)

℄ (-)0+18±
INV.=45.08±(20"W)
INV.=45.3±(12")

℄ 0+36±
INV.=44.4±

℄ 0+51.39
℄ EXIST.CB #A-8
INV.=44.99±

℄ 0+56±
INV.=43.4±(12"W)

℄ 0+76±
INV.=42.1±(12"W)

℄ 0+96±
INV.=40.6±(12"W)

℄ 1+16±
INV.=38.9±(12"W)

℄ 1+56±
INV.=34.7±(12"W)

INV.EXIST. 12"C.I.WATER CL.150

INV.EXIST. 18"RCP CL.III 238 LF @ 10.00%

INV.EXIST. 8"V.C.SEWER

℄ 1+96.39
℄ EXIST.SMH #3-2
INV.=28.36±(6")
INV.=28.19±(8")

℄ 2+26±
INV.=26.7±(12"W)

℄ 2+69.40
℄ CB #W-16
INV.=22.00

℄ 2+69.43
℄ EXIST.DMH #A-4
INV.=21.33±

℄ 2+86±
INV.=21.3±(12"W)

INV.EXIST. 18"RCP CL.III
32 LF @ 6.17%

INV.NEW 18"RCP CL.III
30 LF @ 6.43%

INV.EXIST. 8"V.C.SEWER
180.60 LF @ 8.60%

℄ 3+26±
INV.=18.5±(12"W)

℄ 3+24.50
℄ NEW DMH #W-1
INV.=18.00

℄ 3+54.50
℄ NEW CB #W-1
INV.=16.97±
CONNECT TO EXIST 18"RCP

℄ 3+66±
INV.=14.2±(12"W)

℄ 3+81.39±
℄ EXIST.SMH #3-1
INV.=11.69±
INV.=9.59±
SHALLOW DROP

(-)0.68%

INV.EXIST. 18"RCP CL.III
95 LF @ 1.78%

HGL

℄4+21.59
WATER CONN.

℄ 4+56±
INV.=13.0±(12"W)

INV.EXIST. 12" C.I.WATER CL 150

INV.EXIST. 8"V.C.SEWER
52 LF @ 0.77%

INV.EXIST. 8"V.C.SEWER
177.34 LF @ 0.77%

℄4+31.20
℄ NEW SMH #W-2
INV.=9.19±

℄ 4+07.39
℄ CB #A-7
INV.=14.04(#W-1)
INV.=13.19(DMH #A-4)

℄ 3+86±
INV.=13.0±(12"W)

INV.EXIST. 18"RCP CL.III
64 LFt @ 3.40%

PROPERTY OF DPP
WASTEWATER BRANCH
RETURN TO FIRST FLOOR COUNTER

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)
12/28/95 DATE

APPROVED:
CHIEF, BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
12/19/95 DATE

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY R/W ONLY)
10/12/94 DATE

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W & DRAIN CONNECTION ONLY)
CHIEF, DIVISION OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU
1/5/95 DATE

CALVIN D. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 1768-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED
1	RELOCATE EXIST FH #L2794 TO ℄ 0+58.08 RD "C"		BWS 4/24/96

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
WAIOLU STREET

PROJECT NO.

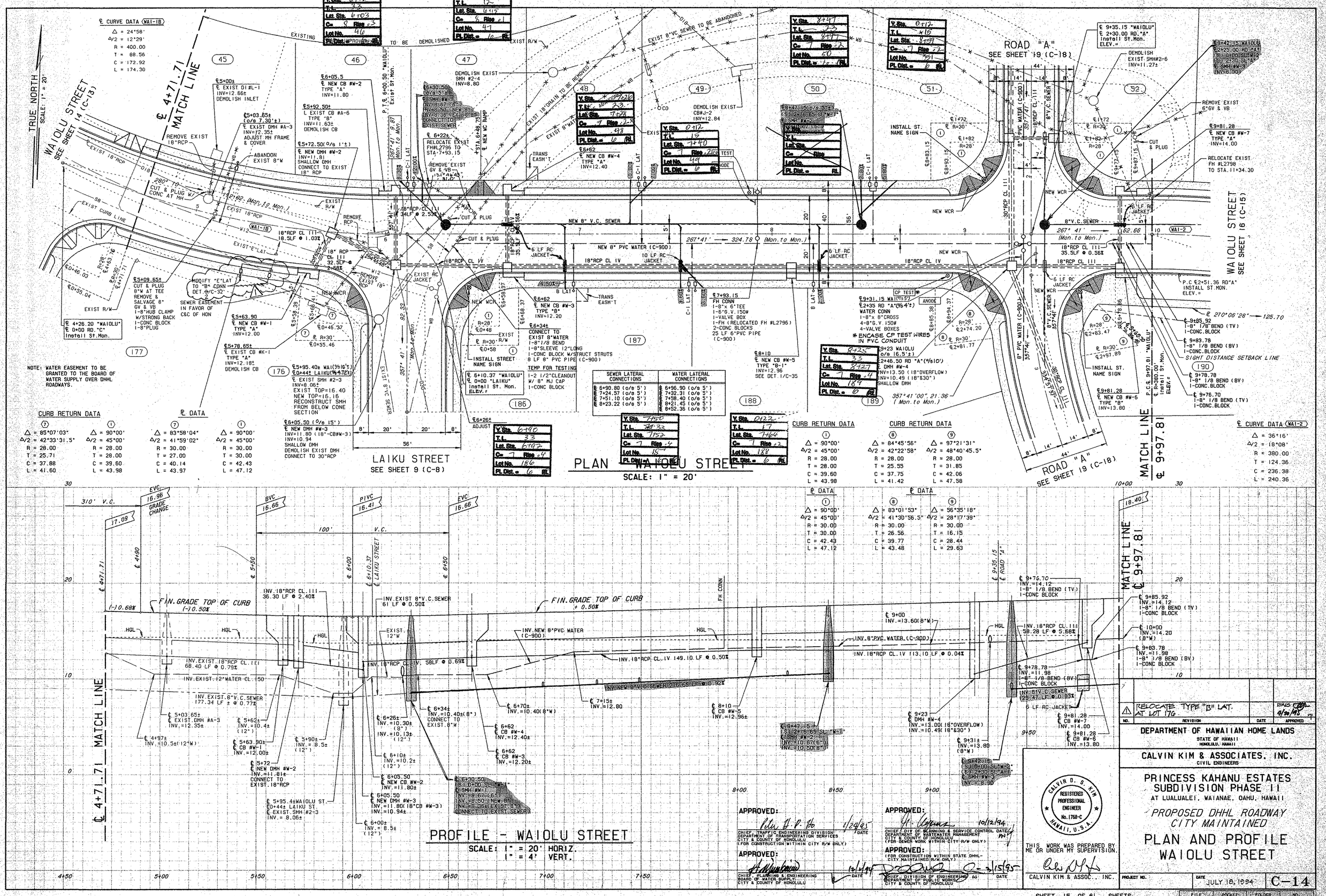
DATE JULY 18, 1994

C-13

SHEET 14 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.

(428)


℄ CURVE DATA (WAI-1B)
Δ = 24°58'
Δ/2 = 12°29'
R = 400.00
T = 88.56
C = 172.92
L = 174.30
TRUE NORTH
SCALE: 1" = 20'
WAIOLU STREET
SEE SHEET 4 (C-13)
℄ 4+71.71 MATCH LINE
EXISTING
TO BE DEMOLISHED
EXIST R/W
EXIST 8"VC SEWER TO BE ABANDONED
ROAD "A"
SEE SHEET 19 (C-18)
REMOVE EXIST 18"RCP
EXIST 18"RCP
CUT & PLUG W/ CONC AT MH
EXIST CURB LINE
EXIST 8"W
EXIST E"LAT
REMOVE RCP
18"RCP CL III 18.5LF @ 1.03±
18" RCP CL III 32.5LF @ 2.68±
NEW 8" V.C. SEWER
18"RCP CL IV
NEW 8" PVC WATER (C-900)
10 LF RC JACKET
6 LF RC JACKET
NEW WCR
EXIST RC JACKET
8 LAT
TRANS EASM'T
EXIST 18"DRAIN TO BE REMOVED
DEMOLISH EXIST SMH #2-4 INV=8.80
DEMOLISH EXIST CB#J-2 INV=12.84
DEMOLISH EXIST SMH#2-6 INV=11.27±
P.T.℄ 6+00.50 "WAIOLU" Exist St.Mon.
℄ 4+26.20 "WAIOLU" ℄ 0+00 RD."C" Install St.Mon.
NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.
SEWER EASEMENT IN FAVOR OF C&C OF HON
177
176
175
187
186
188
189
190
LAIKU STREET
SEE SHEET 9 (C-8)
PLAN - WAIOLU STREET
SCALE: 1" = 20'
MATCH LINE ℄ 9+97.81
WAIOLU STREET
SEE SHEET 16 (C-15)
ROAD "A"
SEE SHEET 19 (C-18)
CURB RETURN DATA
℄ DATA
℄ CURVE DATA (WAI-2)
Δ = 36°16'
Δ/2 = 18°08'
R = 380.00
T = 124.36
C = 236.38
L = 240.36
310' V.C.
100' V.C.
EVC 16.96 GRADE CHANGE
BVC 16.66
PVC 16.41
EVC 16.66
17.09
FIN.GRADE TOP OF CURB (-)0.50%
FIN.GRADE TOP OF CURB + 0.50%
(-)0.68%
INV.18"RCP CL.III 36.30 LF @ 2.40%
INV.EXIST 8"V.C.SEWER 61 LF @ 0.50%
INV.EXIST.18"RCP CL.III 68.40 LF @ 0.79%
INV.EXIST.12"WATER CL.150
INV.EXIST.6"V.C.SEWER 177.34 LF ± @ 0.77%
INV.NEW 8"PVC WATER (C-900)
INV.18"RCP CL.IV 149.10 LF @ 0.50%
INV.NEW 8"V.C.SEWER 216.65 LF @ 0.92%
INV.8"PVC WATER (C-900)
INV.18"RCP CL.IV 113.10 LF @ 0.04%
INV.18"RCP CL.III 58.28 LF @ 5.68%
6 LF RC JACKET
HGL
FH CONN
PROFILE - WAIOLU STREET
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.
APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION DEPARTMENT OF TRANSPORTATION SERVICES CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY)
CHIEF, PLANNING & ENGINEERING BOARD OF WATER SUPPLY CITY & COUNTY OF HONOLULU
CHIEF, DIV. OF PLANNING & SERVICE CONTROL DEPARTMENT OF WASTEWATER MANAGEMENT CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIVISION OF ENGINEERING DEPARTMENT OF PUBLIC WORKS CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS
PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY CITY MAINTAINED
PLAN AND PROFILE WAIOLU STREET
CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 7768-C HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.
PROJECT NO.
DATE JULY 18, 1994
C-14
SHEET 15 OF 81 SHEETS

PLAN - WAIOLU STREET

SCALE: 1" = 20'

PROFILE - WAIOLU STREET

SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

WAIOLU STREET
SEE SHEET 17 (C-16)

℄ 9+97.81 MATCH LINE

℄ 15+00 MATCH LINE

TRUE NORTH
SCALE: 1" = 20'

SEE SHEET 15 (C-14)

SIGHT DISTANCE SETBACK LINE

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

℄ CURVE DATA (WAI-2)
Δ = 36°14'30"
Δ/2 = 18°07'15"
R = 380.00
T = 124.36
C = 236.38
L = 240.36

WATERLINE CURVE DATA
Δ = 36°14'30"
Δ/2 = 18°07'15"
R = 375.00
T = 122.72
C = 233.27
L = 237.20

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
10+10.69 (o/s 5.30'±)	10+17.30 (o/s 5')
10+51.15 (o/s 8.82'±)	10+66.02 (o/s 5')
12+38.56 (o/s 5')	10+76.51 (o/s 5')
13+20.90 (o/s 5')	11+90.95 (o/s 5')
13+58.56 (o/s 5')	12+30.97 (o/s 5')
14+46.90 (o/s 5')	13+13.05 (o/s 5')
	13+51.06 (o/s 5')
	14+43 (o/s 5')
	14+67.05 (o/s 5')

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/16/94

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU — DATE 9/15/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
WAIOLU STREET

PROJECT NO.

DATE JULY 18, 1994

C-15

FILE	POCKET	FOLDER	NO.

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
@ 15+36.93 (o/e 5')	@ 15+30.90 (o/e 5')
@ 15+72.84 (o/e 5')	@ 15+64.85 (o/e 5')
@ 16+35.84 (o/e 5')	@ 16+29.54 (o/e 5')
@ 16+98.88 (o/e 5')	@ 16+50.90 (o/e 5')
@ 17+64.77 (o/e 5')	@ 17+66.90 (o/e 5')
@ 18+04.84 (o/e 5')	@ 17+96.89 (o/e 5')
@ 18+38.54 (o/e 5')	@ 18+30.90 (o/e 5')
@ 18+64.84 (o/e 5'±)	@ 18+58.54 (o/e 5')
	@ 19+57.78 (o/e 3.10'±)
	@ 20+09.04 (o/e 7.98'±)

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

PLAN - WAIOLU STREET

SCALE: 1" = 20'

PROFILE - WAIOLU STREET

SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/19/94

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU — DATE 2/15/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY CITY MAINTAINED

PLAN AND PROFILE WAIOLU STREET

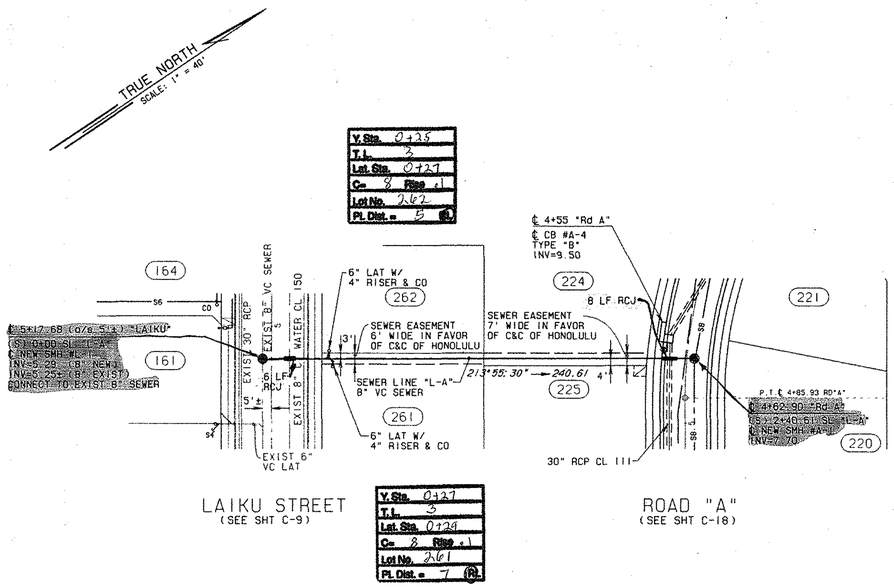
PROJECT NO.

DATE JULY 18, 1994

C-16

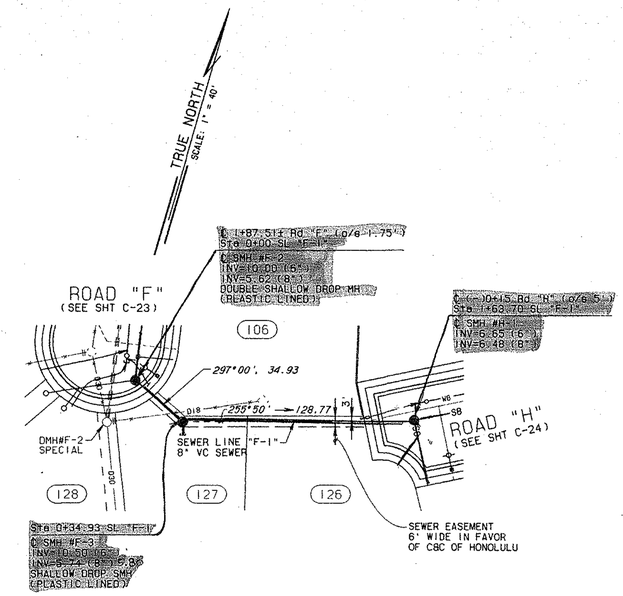
SHEET 17 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.



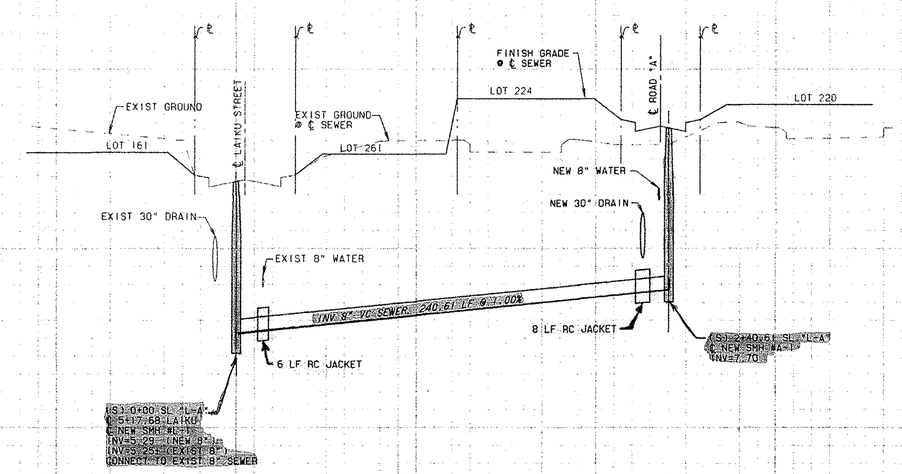
PLAN - SEWER LINE "L-A"

SCALE: 1" = 40'



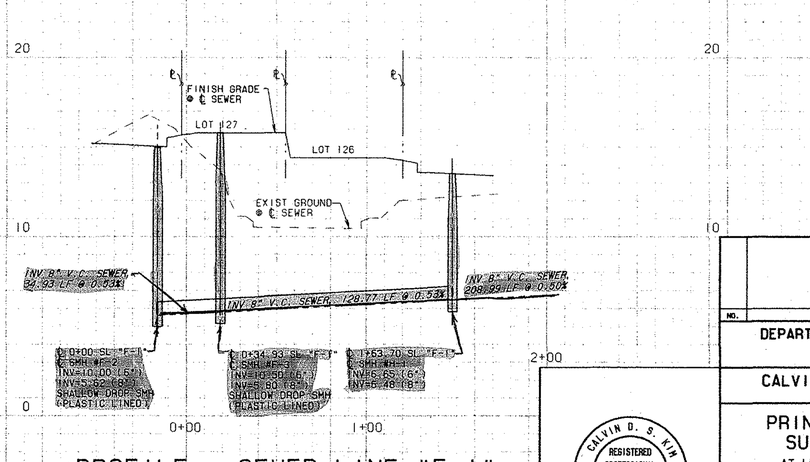
PLAN - SEWER LINE "F-1"

SCALE: 1" = 40'



PROFILE - SEWER LINE "L-A"

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



PROFILE - SEWER LINE "F-1"

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

APPROVED:

10/12/94

CHIEF, DIV OF PLANNING & SERVICE CONTROL DATE
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY R/W ONLY)

CALVIN D. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 1768-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

PLAN AND PROFILE
SEWER LINE "L-A" & "F-I"

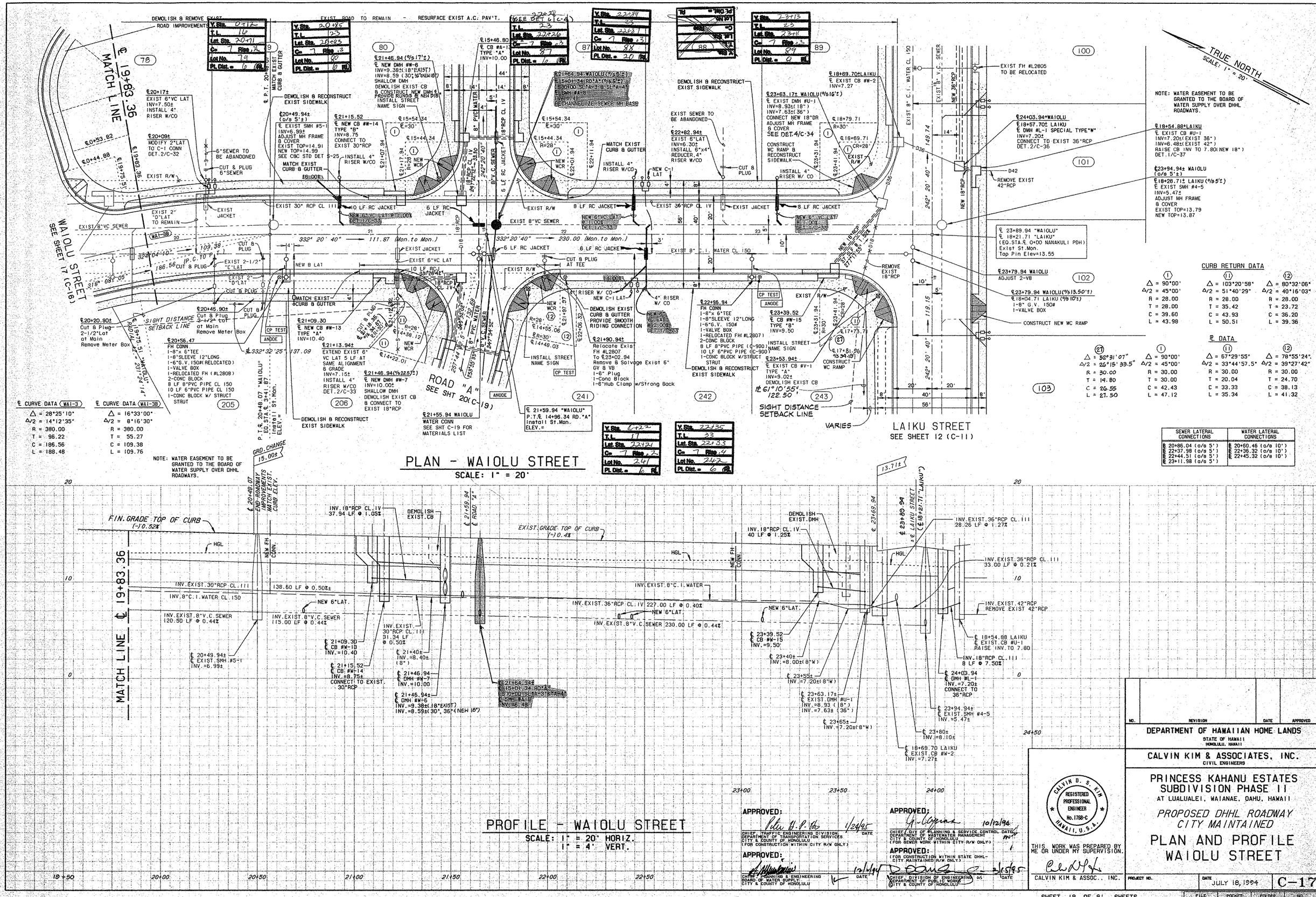
428

PROJECT NO.

DATE JULY 18, 1994

C-26

FILE | POCKET | FOLDER | NO.



APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, BUREAU OF ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/14/94

APPROVED:
CHIEF, DIV. OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED: (FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU — DATE 2/15/95

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 7768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY CITY MAINTAINED

PLAN AND PROFILE WAIOLU STREET

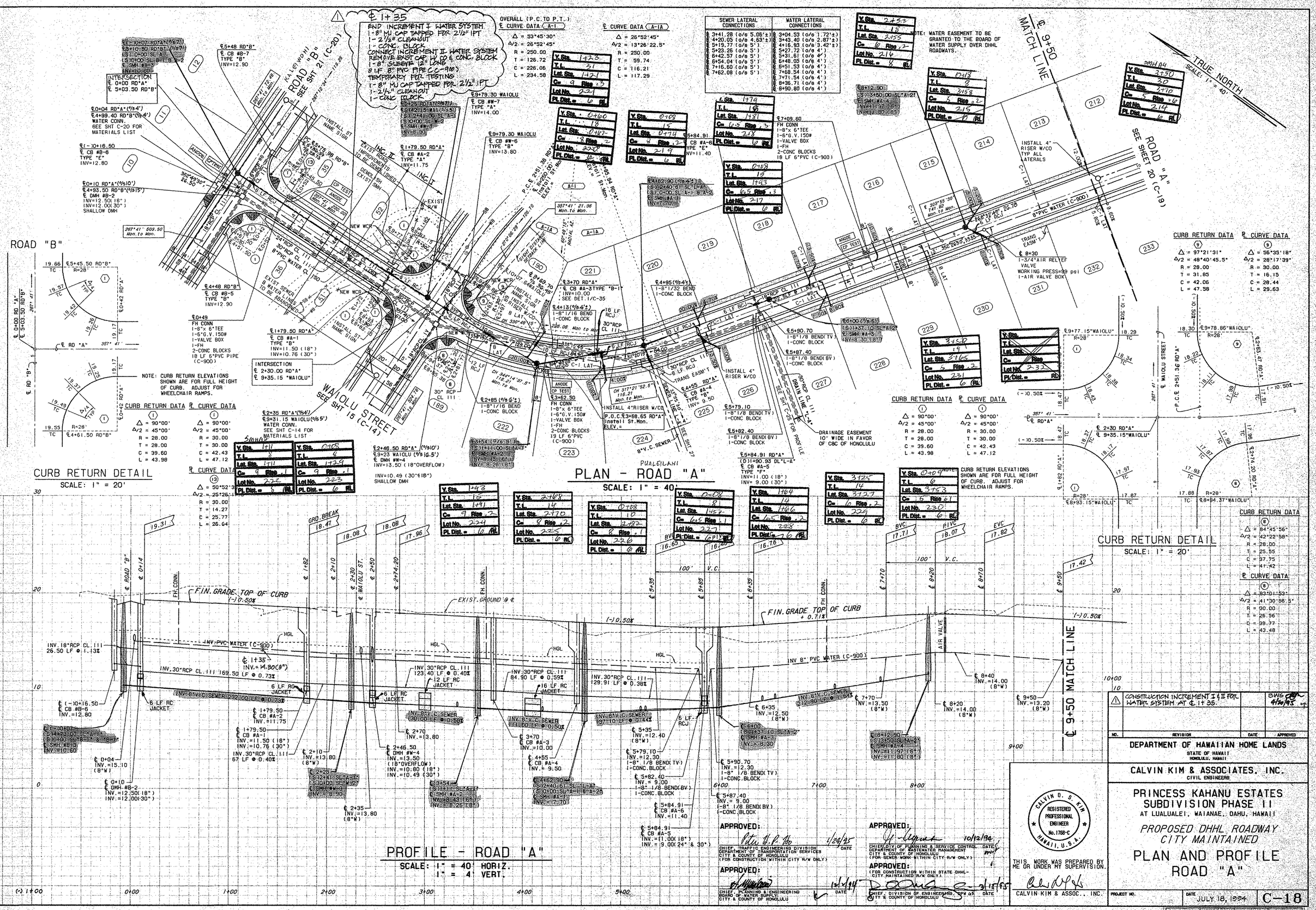
PROJECT NO.

DATE JULY 18, 1994

C-17

SHEET 18 OF 81 SHEETS

FILE	POCKET	FOLDER	NO.


℄ 1+35
END INCREMENT I WATER SYSTEM
1-8" MJ CAP TAPPED FOR 2½" IPT
1-2½" CLEANOUT
1-CONC. BLOCK
CONNECT INCREMENT II WATER SYSTEM
REMOVE EXIST CAP W/ PIPE & CONC. BLOCK
1-8" SLEEVE 12" LONG
8 LF 8" PVC PIPE (C-900)
TEMPORARY FOR TESTING
1-8" MJ CAP TAPPED FOR 2½" IPT
1-2½" CLEANOUT
1-CONC BLOCK
OVERALL (P.C. TO P.T.)
℄ CURVE DATA (A-1)
Δ = 33°45'30"
Δ/2 = 26°52'45"
R = 250.00
T = 126.72
C = 226.06
L = 234.58
℄ CURVE DATA (A-1A)
Δ = 26°52'45"
Δ/2 = 13°26'22.5"
R = 250.00
T = 59.74
C = 116.21
L = 117.29
SEWER LATERAL CONNECTIONS
WATER LATERAL CONNECTIONS
NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.
℄ 1+00 RD "A"
℄ 5+03.50 RD "B"
ROAD "B"
ROAD "A"
SEE SHT 21 (C-20)
SEE SHT 20 (C-19)
SEE SHT 15 (C-14)
WAIOLU STREET
MATCH LINE ℄ 9+50
TRUE NORTH
SCALE: 1" = 40'
INTERSECTION ℄ 0+00 RD "A" ℄ 5+03.50 RD "B"
INTERSECTION ℄ 2+30.00 RD "A" ℄ 9+35.15 "WAIOLU"
NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.
CURB RETURN DATA
℄ CURVE DATA
DRAINAGE EASEMENT 10' WIDE IN FAVOR OF CBC OF HONOLULU
INSTALL 4" RISER W/CO TYP ALL LATERALS
INSTALL 4" RISER W/CO
TRANS EASM'T
℄ 8+30 1-3/4" AIR RELIEF VALVE WORKING PRESS=39 psi 1-AIR VALVE BOX
AIR VALVE
PUALELIANI
WAIOLU STREET
CURB RETURN DETAIL
SCALE: 1" = 20'
PLAN - ROAD "A"
SCALE: 1" = 40'
PROFILE - ROAD "A"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.
FIN. GRADE TOP OF CURB (-)0.50%
EXIST. GROUND @ ℄
FIN. GRADE TOP OF CURB + 0.71%
INV. 8" PVC WATER (C-900)
INV. 18"RCP CL. III 26.50 LF @ 1.13%
INV. 30"RCP CL. III 169.50 LF @ 0.73%
INV. 30"RCP CL. III 123.40 LF @ 0.40%
INV. 30"RCP CL. III 84.90 LF @ 0.59%
INV. 30"RCP CL. III 129.91 LF @ 0.38%
INV. 8" V.C. SEWER 232.00 LF @ 0.75%
INV. 8" V.C. SEWER 130.00 LF @ 0.50%
INV. 8" V.C. SEWER 70.00 LF @ 0.50%
INV. 8" V.C. SEWER 97.10 LF @ 0.44%
INV. 8" V.C. SEWER 212.90 LF @ 0.47%
6 LF RC JACKET
12 LF RC JACKET
16 LF RC JACKET
℄ 9+50 MATCH LINE
CONSTRUCTION INCREMENT I & II FOR WATER SYSTEM AT ℄ 1+35.
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC. CIVIL ENGINEERS
PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY CITY MAINTAINED
PLAN AND PROFILE ROAD "A"
APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION DEPARTMENT OF TRANSPORTATION SERVICES CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY)
1/24/95 DATE
APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL DEPARTMENT OF WASTEWATER MANAGEMENT CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY)
10/12/94 DATE
APPROVED:
CHIEF, PLANNING & ENGINEERING BOARD OF WATER SUPPLY CITY & COUNTY OF HONOLULU
12/1/94 DATE
APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW (45 CITY & COUNTY OF HONOLULU
2/15/95 DATE
CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.
PROJECT NO.
DATE JULY 18, 1994
C-18
SHEET 19 OF 81 SHEETS
FILE POCKET FOLDER NO.

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
@ 10+17.95 (o/e 5')	@ 10+13.36 (o/e 4')
@ 10+78.21 (o/e 5')	@ 10+60.60 (o/e 4')
@ 11+37.93 (o/e 5')	@ 11+30.29 (o/e 4')
@ 11+98.19 (o/e 5')	@ 11+89.58 (o/e 4')
@ 12+37.91 (o/e 4.93'±)	@ 12+36.79 (o/e 4.20'±)
@ 13+05.04 (o/e 8.88'±)	@ 13+00.55 (o/e 7.25'±)
@ 13+41.54 (o/e 9.44'±)	@ 13+45.07 (o/e 6.07'±)
@ 13+96.25 (o/e 0.25'±)	@ 13+96.42 (o/e 1.18'±)
@ 16+16.19 (o/e 5')	@ 13+60.54 (o/e 4')
@ 16+26.34 (o/e 5')	@ 15+15.15 (o/e 4')
	@ 16+24.51 (o/e 4')
	@ 16+75.15 (o/e 10.68±)
	@ 17+00 (o/e 13')

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

PLAN - ROAD "A"

SCALE: 1" = 40'

PROFILE - ROAD "A"

SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CURB RETURN DETAIL

SCALE: 1" = 20'

CURB RETURN DATA

(11)	(12)
Δ = 103°20'58"	Δ = 80°32'05"
Δ/2 = 51°40'29"	Δ/2 = 40°16'03"
R = 28.00	R = 28.00
T = 35.42	T = 23.72
C = 43.93	C = 36.20
L = 50.51	L = 39.36

℄ CURVE DATA

(11)	(12)
Δ = 67°29'55"	Δ = 78°55'24"
Δ/2 = 33°44'57.5	Δ/2 = 39°27'42"
R = 30.00	R = 30.00
T = 20.04	T = 24.70
C = 33.33	C = 38.13
L = 35.34	L = 41.32

CURB RETURN DATA

(1)	(1)
Δ = 90°00'	Δ = 90°00'
Δ/2 = 45°00'	Δ/2 = 45°00'
R = 28.00	R = 30.00
T = 28.00	T = 30.00
C = 39.60	C = 42.43
L = 43.98	L = 47.12

CURB RETURN DATA

(20)	(21)
Δ = 60°41'36"	Δ =229°26'38"
Δ/2 = 30°20'49"	Δ/2 =114°43'19"
R= 48.00	R = 32.00
T = 28.10	C = 58.13
C = 48.50	L =128.15
L = 50.85	Δ/10= 22°56'39.8"

TURNAROUND DETAIL

SCALE: 1" = 20'

FH CONNECTION STA. 13+48

SCALE: 1" = 10' HORIZ.
1" = 4' VERT.

NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.

NOTE: LATERAL & METER BOX SHALL BE CLEAR OF DRIVEWAYS & DRIVEWAY FLARES.

NO.	REVISION	DATE	APPROVED
1	RELOCATE TYPE "B" LAT. AT LOT 83 & 86. CHANGE TYPE "B" LAT. AT LOT 84 TO C-1 LAT. DELETE B LAT. AT LOT 85		DHHL 4/24/95

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
ROAD "A"

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU — DATE 12/1/94

APPROVED:
CHIEF, DIV. OF PLANNING & SERVICE CONTROL
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW — DATE 3/6/95

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.
CALVIN KIM & ASSOC., INC.

PROJECT NO.
DATE: JULY 18, 1994
C-19

SHEET 20 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.

HAKIMO ROAD (CITY)

SUBDIVISION BOUNDARY

ROAD "A"
SEE SHEET 19 (C-18)

SEE SHEET 22 (C-21) ROAD "B"

E 9+50 MATCH LINE

TRUE NORTH
SCALE: 1" = 40'

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

DRAINAGE EASEMENT 5'WIDE IN FAVOR OF ADJOINING LOTS

DRAINAGE EASEMENT 5'WIDE IN FAVOR OF LOT OWNERS

ROADWAY LOT

LOT DITCH AT WALL

CMU WALL (TYPE "F") SEE GRADING PLANS (BOUND SEPARATELY)

DRAINAGE DITCH DET 4/C-34

DRAINAGE DITCH DET 4/C-43

TRANS EASM'T

CP TEST

ANODE

INSTALL STREET NAME SIGN

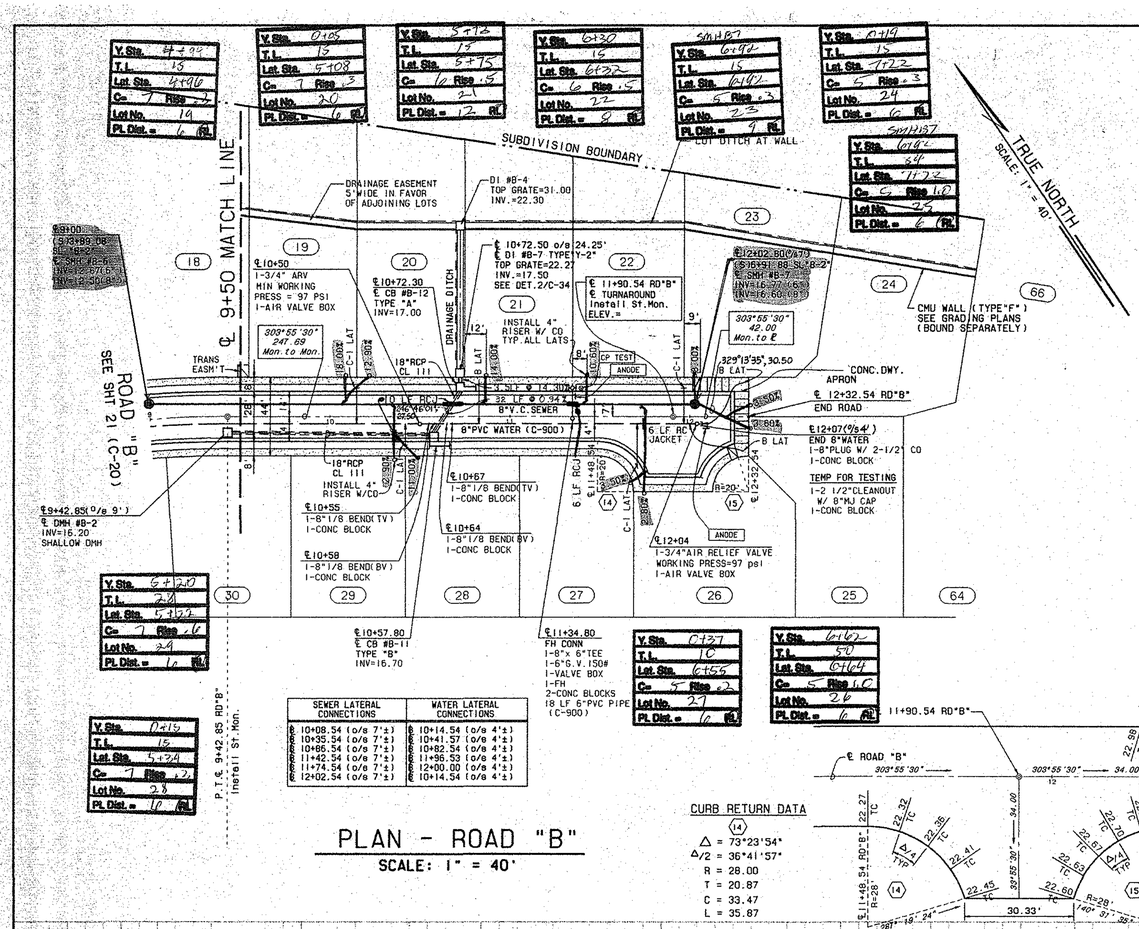
INSTALL 4" RISER W/CO

INSTALL 4" RISER W/CO TYP ALL LAT

INSTALL 4" RISER W/CO

INSTALL 4" RISER W/CO

INSTALL 4" RISER W/CO



NO.	REVISION	DATE	APPROVED
1	RELOCATE EXIST FH #L2794 TO ℄ 0+53.00 RD"C", RELOCATE TYPE "B" LAT AT LOT 181.	4/20/95	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II

AT LUALUALEI, WAIANAE, OAHU, HAWAII

PROPOSED DHHL ROADWAY CITY MAINTAINED

PLAN AND PROFILE ROADS "B" & "C"

PROJECT NO.

DATE JULY 18, 1994

C-21

FILE | POCKET | FOLDER | NO.

TRUE NORTH
SCALE: 1" = 40'

WAIOLU STREET
SEE SHEET 17 (C-16)

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

INTERSECTION
℄ 0+00 RD"D"
℄ 17+15.58 "WAIOLU"

℄(-)0+05 RD"D"(9%5')
℄17+19.58 WAI(9%5')
WATER CONN
See Sht C-16 for Materials List

℄0+16 RD"D"(9%10')
℄17+25.58 WAI(9%10')
DMH #W-5
INV=10.28
SHALLOW DMH

303°55'30" 152.29 Mon.to Mon.

303°55'30" 486.56 Mon.to Mon.

℄0+40S RD"D"(9%5')
℄17+10.58 WAI(9%5')
(S)0+00.SL"D"
(S)242°12.5L"W-3"
℄SMH #W-7
INV=8.62

℄0+50.50
℄ CB #D-2
TYPE "A"
INV=11.10

℄0+50.50
℄ CB #D-1
TYPE "B"
INV=10.80

℄0+60.50
(S)0+55 SL"D"
℄SMH #D-1
INV=9.00 (8")

℄1+89.80
(S)1+84.80 SL"D"
℄SMH #D-2
INV=13.17 (6")
INV=13.00 (8")

℄1+77
FH CONN
1-8"x 6"TEE
1-6"G.V.150#
1-VALVE BOX
1-RELOCATED FH
2-CONC BLOCKS
18 LF 6"PVC PIPE (C-900)

℄1+79.80 RD"D"
Install St.Mon.
ELEV.=

℄1+87
END 8" WATER
1-8"Plug w/ 2-1/2" CO
1-Conc Block
1-3/4"Air Valve Working Press=99 psi
1-Air Valve Box

TEMP FOR TESTING
1 2-1/2"Cleanout w/ 8" MJ Cap
1-Conc Block

STA.1+79.80 9/s 18'RIGHT
CTR.OF CUL-DE-SAC
Install St.Mon.
ELEV.=

NEW CMU WALL (TYPE"F")
SEE GRADING PLANS
(BOUND SEPARATELY)

DRAINAGE EASEMENT 5'WIDE IN FAVOR OF ADJOINING LOTS

LOT DITCH AT WALL SEE DET 3/C-34

NEW CHAIN LINK FENCE 6' HIGH

NEW 20' WIDE CONC DWY APRON
303°55'30", 18.00 Mon.to Mon.

Relocate Exist FH #L2810

Exist DI to be Demolished

Exist Drain to be Abandoned

Exist SMH to be Demolished

Exist Sewer & Water to be Abandoned

EXIST R/W

NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
℄ 1+24.00 (o/e 5'±)	℄ 1+20.00 (o/e 4'±)
℄ 1+72.00 (o/e 5'±)	℄ 1+23.00 (o/e 4'±)
℄ 1+89.80 (o/e 5'±)	℄ 1+73.80 (o/e 4'±)
	℄ 1+87.00 (o/e 4'±)

PLAN - ROAD "D"
SCALE: 1" = 40'

CURB RETURN DATA ①
△ = 90°00'
△/2 = 45°00'
R = 28.00
T = 28.00
C = 39.60
L = 43.98

℄ DATA ①
△ = 90°00'
△/2 = 45°00'
R = 30.00
T = 30.00
C = 42.43
L = 47.12

CURB RETURN DATA ⑱
△ = 56°37'59"
△/2 = 28°18'59.5"
R = 48.00
T = 25.86
C = 45.54
L = 47.44

CURB RETURN DATA ⑲
△ =236°37'59"
△/2 =118°18'59.5"
R = 32.00
C = 56.34
L =132.16
△/10=23°39'47.9"

TRUE NORTH
SCALE: 1" = 40'

WAIOLU STREET
SEE SHT 17 (C-16)

Chord 309°51'35" 78.58 Mon to Mon

P.C.℄ 18+59.59 "WAIOLU"
℄ R=380.00

℄0+19.50(9%5')
(S)1+93.12 WAI(9%5')
(S)0+00.SL"E"(9%5')
℄SMH #W-8
INV=7.52±
CONNECT TO EXIST 8"SEWER

INTERSECTION
℄ (-)0+00.92 RD"E"
P.O.C.℄19+38.31"WAIOLU"

℄(-)0+06 RD"A"(9%4')
℄19+42.12WAI(9%3.5')
WATER CONN
See Sht C-16 for Materials List

℄19+71 WAIOLU
CONNECT TO EXIST 8" WATER
See Sht C-16 for Materials List

P.T.℄ 20+48.07 "WAIOLU"

Chord 324°04'10" 109.38 Mon.to Mon

℄19+78± WAIOLU
CONNECT TO EXIST 30"RCP

℄0+48.30
℄ CB #E-2
TYPE "A"
INV=11.50

℄0+55.10
1-8"1/8"BEND(TV)
1-CONC BLOCK

℄0+53
1-8"1/8"BEND(V)
1-CONC BLOCK

℄0+29.50±
RD"E"(9% 10')
℄ DMH #W-6
INV=9.60
SHALLOW DMH

℄0+48.30
℄ CB #E-1
TYPE "B"
INV=11.20

℄1+08.26
FH CONN
1-8"x 6"TEE
1-6"G.V.150#
1-VALVE BOX
1-FH
2-CONC BLOCKS
26 LF 6"PVC PIPE (C-900)

℄1+20(9/s 11')
℄ DMH #E-1
INV=12.00
SHALLOW DMH

℄1+38 (9/s 4')
END 8" WATER
1-8"PLUG W/ 2-1/2" CO
1-CONC.BLOCK
1-3/4"AIR VALVE
WORKING PRESS.=99 psi
1-AIR VALVE BOX

TEMP FOR TESTING
1- 2-1/2"CLEANOUT W/ 8"MJ CAP
1-CONC.BLOCK

℄1+50 (9/s 5')
(S)1+30.50 SL"E"
℄SMH #E-1
INV=10.27±(6")
INV=10.00 (8")

225°35'20" 143.42 Mon.to Mon

DRAINAGE EASEMENT 5'WIDE IN FAVOR OF ADJOINING LOTS

℄ 1+42.50 "RD"E"
Install St.Mon.
ELEV.=

315°35'20", 18.00 Mon.to Mon.

Tie Ctr to ℄ D.I.
244°02'01", 61.80

LOT DITCH SEE DET 4/C-34

℄ D.I.#E-1
TYPE "Y-2"
TOP GRATE=17.75
INV=13.00
SEE DET.2/C-34

STA.1+42.50 /s 18'RIGHT
CTR.OF CUL-DE-SAC
Install St.Mon.
ELEV.=

NEW CMU WALL (TYPE"F")
SEE GRADING PLANS
(BOUND SEPARATELY)

LOT DITCH AT WALL SEE DET 3/C-34

NEW CHAIN LINK FENCE 6' HIGH

D.I.#E-1
TOP GRATE=22.12
INV.=18.40

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
℄ 1+17.17 (o/e 5'±)	℄ 1+12.75 (o/e 4'±)
℄ 1+50.00 (o/e 5'±)	℄ 1+28.50 (o/e 4'±)

PLAN - ROAD "E"
SCALE: 1" = 40'

CURB RETURN DATA ⑩
△ = 84°11'06"
△/2 = 42°05'33"
R = 28.00
T = 25.29
C = 37.54
L = 41.14

℄ DATA ⑩
△ = 83°00'07"
△/2 = 41°30'03.5"
R = 30.00
T = 26.54
C = 39.76
L = 43.46

CURB RETURN DETAIL
SCALE: 1" = 20'

NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.

TURNAROUND DETAIL
SCALE: 1" = 20'

CURB RETURN DETAIL
SCALE: 1" = 20'

TURNAROUND DETAIL
SCALE: 1" = 20'

PROFILE - ROAD "D"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

PROFILE - ROAD "E"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)
DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
DATE 12/16/94

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU
(FOR SEWER WORK WITHIN CITY R/W ONLY)
DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL CITY MAINTAINED R/W & DRAIN CONNECTION ONLY)
CHIEF, DIVISION OF ENGINEERING, DPM
CITY & COUNTY OF HONOLULU
DATE 3/15/95

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

REGISTERED PROFESSIONAL ENGINEER
No. 1768-C
CALVIN D. S. KIM
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

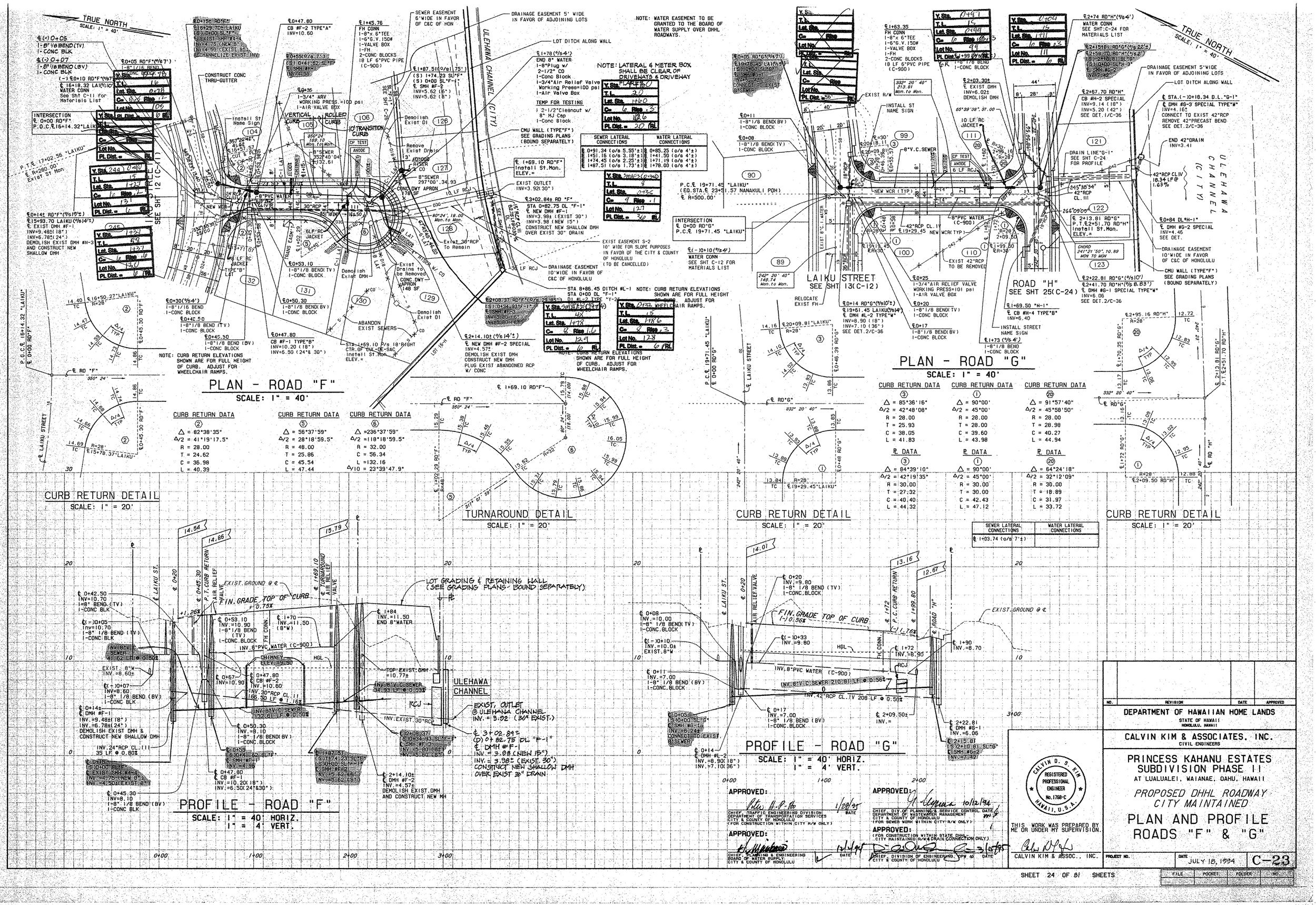
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE ROADS "D" & "E"

PROJECT NO.
DATE JULY 18, 1994
C-22

SHEET 23 OF 81 SHEETS

FILE | POCKET | FOLDER | NO.


TRUE NORTH
SCALE: 1" = 40'
SEE SHT C-11
SEE SHT C-12
SEE SHT C-13
ULEHAWA CHANNEL (CITY)
LAIKU STREET
SEE SHT 13(C-12)
ROAD "H"
SEE SHT 25(C-24)
NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.
NOTE: LATERAL & METER BOX SHALL BE CLEAR OF DRIVEWAYS & DRIVEWAY
SEWER LATERAL CONNECTIONS
WATER LATERAL CONNECTIONS
INTERSECTION ℄ 0+00 RD"F" P.O.C.℄ 16+14.32"LAIKU"
INTERSECTION ℄ 0+00 RD"G" P.C.℄ 19+71.45 "LAIKU"
P.C.℄ 19+71.45 "LAIKU" (EQ.STA.℄ 23+51.57 NANAKULI PDH) ℄ R=500.00'
P.T.℄ 17+02.56 "LAIKU" ℄ R=280.00' Exist St Mon
RELOCATE EXIST FH
EXIST R/W
INSTALL ST NAME SIGN
INSTALL STREET NAME SIGN
EXIST 42"RCP TO BE REMOVED
NEW WCR (TYP.)
8"PVC WATER (C-900)
8"V.C.SEWER
42"RCP CL.III
42"RCP CL.IV
6' C.M.P. RCJ
10 LF RCJ
36 LF RCJ
CP TEST
ANODE
6 LF RCJ
DRAINAGE EASEMENT 5' WIDE IN FAVOR OF ADJOINING LOTS
LOT DITCH ALONG WALL
CONSTRUCT CONC THRU-GUTTER
CMU WALL (TYPE"F") SEE GRADING PLANS (BOUND SEPARATELY)
EXIST OUTLET INV=3.92(30")
EXIST EASEMENT S-2 10' WIDE FOR SLOPE PURPOSES IN FAVOR OF THE CITY & COUNTY OF HONOLULU (TO BE CANCELLED)
DRAINAGE EASEMENT 10'WIDE IN FAVOR OF C&C OF HONOLULU
WATER CONN SEE SHT C-12 FOR MATERIALS LIST
WATER CONN SEE SHT C-24 FOR MATERIALS LIST
DRAINAGE EASEMENT 5'WIDE IN FAVOR OF ADJOINING LOTS
CMU WALL (TYPE"F") SEE GRADING PLANS (BOUND SEPARATELY)
DRAIN LINE"G-1" SEE SHT C-24 FOR PROFILE
END 42"DRAIN INV=3.41
42"RCP CL.IV 18.34 LF@ 1.63%
ABANDON EXIST SEWERS
Exist Drains to be Removed
CONC DWY APRON 178 SF
CONC DWY APRON 148 SF
Remove Exist Drain
Demolish Exist DI
Demolish Exist DMH
Exist 30"RCP To Remain
Install St Name Sign
VERTICAL CURB
ROLLER CURB
10' TRANSITION CURB
3-1/4" ARV WORKING PRESS.=100 psi
1-AIR VALVE BOX
3-1/4" AIR RELIEF VALVE WORKING PRESS=100 psi
1-AIR VALVE BOX
1-FH
2-CONC BLOCKS
18 LF 6"PVC PIPE (C-900)
TEMP FOR TESTING
1 2-1/2"Cleanout w/ 8" MJ Cap
1-Conc Block
1-8"1/8 BEND
1-CONC BLOCK
1-8"1/8 BEND(BV)
1-8"1/8 BEND(TV)
1-8"1/16 BEND
1-8"1/16 BEND(BV)
1-8"1/16 BEND(TV)
1-CONC BLK
1-8"V.G.V.
1-VALVE BOX
1-FH
2-CONC BLOCKS
18 LF 6"PVC PIPE (C-900)
1-8"1/8 BEND
1-CONC BLOCK
JACKET
TYPE"B" LAT
TRANS EASH-1
TRANS EASH-2
CB #F-2 TYPE"A" INV=10.60
CB #F-1 TYPE"B" INV=10.20 (18") INV=6.50 (24"& 30")
CB #F-2 SPECIAL INV=4.57 DEMOLISH EXIST DMH CONSTRUCT NEW DMH PLUG EXIST ABANDONED RCP W/ CONC
DMH #F-1 INV=9.48±(18") INV=6.78±(24") DEMOLISH EXIST DMH #N-3 AND CONSTRUCT NEW SHALLOW DMH
DMH #F-2 SPECIAL INV=4.57 DEMOLISH EXIST DMH CONSTRUCT NEW MH
DMH #F-1 INV=3.98± (EXIST 30") INV=3.98 (NEW 15") CONSTRUCT NEW SHALLOW DMH OVER EXIST 30" DRAIN
DMH #G-2 SPECIAL TYPE"W" INV=6.06 SEE DET.2/C-36
DMH #G-3 SPECIAL TYPE"W" INV=4.16 CONNECT TO EXIST 42"RCP REMOVE 42"PRECAST BEND SEE DET.2/C-36
DMH #G-3 SPECIAL INV=4.46 SEE DET.
CB #H-4 TYPE"B" INV=6.40
CB #H-2 SPECIAL INV=9.14 (18") INV=5.20 (42") SEE DET.1/C-36
STA 8+86.45 DITCH #L-1 NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.
NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.
NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.
PLAN - ROAD "F"
SCALE: 1" = 40'
PLAN - ROAD "G"
SCALE: 1" = 40'
CURB RETURN DATA
TURNAROUND DETAIL
SCALE: 1" = 20'
CURB RETURN DETAIL
SCALE: 1" = 20'
PROFILE - ROAD "F"
SCALE: 1" = 40' HORIZ. 1" = 4' VERT.
PROFILE - ROAD "G"
SCALE: 1" = 40' HORIZ. 1" = 4' VERT.
EXIST.GROUND @ ℄
FIN.GRADE TOP OF CURB
LOT GRADING & RETAINING WALL (SEE GRADING PLANS- BOUND SEPARATELY)
AIR RELIEF VALVE
P.T. CURB RETURN
P.C. CURB RETURN
FH CONN.
HGL
CHIMNEY CL=19.30
TOP EXIST DMH =10.77±
EXIST, OUTLET @ULEHAWA CHANNEL INV. = 3.92 (30" EXIST.)
ULEHAWA CHANNEL
℄ 3+02.89± (D) 07 82.75 DL "F-1" ℄ DMH #F-1 INV. = 3.98 (NEW 15") INV. = 3.98± (EXIST. 30") CONSTRUCT NEW SHALLOW DMH OVER EXIST 30" DRAIN
℄ 2+14.10± ℄ DMH #F-2 INV.=4.57± DEMOLISH EXIST.DMH AND CONSTRUCT. NEW MH
℄ 0+14 ℄ DMH #L-2 INV.=8.90(18") INV.=7.10(36")
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII HONOLULU, HAWAII
CALVIN KIM & ASSOCIATES, INC. CIVIL ENGINEERS
PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY CITY MAINTAINED
PLAN AND PROFILE ROADS "F" & "G"
APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU
APPROVED:
CHIEF, PLANNING & ENGINEERING BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY)
APPROVED:
CHIEF, CITY PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY)
APPROVED:
(FOR CONSTRUCTION WITHIN STATE RWY, CITY MAINTAINED R/W & DRAIN CONNECTION ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW
REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.
PROJECT NO.
DATE JULY 18, 1994
C-23
FILE POCKET FOLDER NO.
SHEET 24 OF 81 SHEETS

TRUE NORTH
SCALE: 1" = 40'

ROAD "G"
SEE SHT. 24(C-23)

ULEHAWA CHANNEL

EXIST. MAINTENANCE ROAD

EXIST. 42" RCP TO REMAIN

EXIST SEWERS TO BE ABANDONED

EXIST SEWER TO BE ABANDONED

EXIST DRAIN TO BE REMOVED

EXIST DRAIN TO BE REMOVED

DEMOLISH EXIST DI

DEMOLISH EXIST DMH

INSTALL ST NAME SIGN

TRANS EASH'T

CUT & PLUG

INSTALL 4" RISER W/CO TYP ALL LAT

DRAINAGE EASEMENT IN FAVOR OF C&C OF HON

SEWER EASEMENT 6' WIDE IN FAVOR OF C&C OF HONOLULU

EXIST EASEMENT S-2 10' WIDE FOR SLOPE PURPOSES IN FAVOR OF THE CITY & COUNTY OF HONOLULU (TO BE CANCELLED)

PRIVATE DRAINAGE EASEMENT 5' WIDE IN FAVOR OF LOTS 115 TO 126

CMU WALL TYPE "F" W/ 4'HIGH C.L. FENCE ALONG R.
SEE GRADING PLANS (BOUND SEPARATELY)

EXIST. MAINTENANCE ROAD

TEMP FOR TESTING
1 2-1/2"Cleanout w/ 8" MJ Cap
1-Conc Block

TEMP FOR TESTING
1 2-1/2"Cleanout w/ 8" MJ Cap
1-Conc Block

END 8" WATER
1-8"Plug w/ 2-1/2" CO
1-Conc Block
1-3/4"Air Valve Working Press=
1-Air Valve Box

END 8" WATER
1-8"Plug w/ 2-1/2" CO
1-Conc Block
1-3/4"Air Relief Valve Working Press=101 psi
1-Air Valve Box

STA. 5+27.94 /s 18°LEFT CTR. OF CUL-DE-SAC
Install St.Mon.
ELEV.=

℄ 5+27.95 RD "H"
Install St.Mon.
ELEV.=

℄ 0+00 RD"H"
℄ TURNAROUND
Install St.Mon.

℄ 0+38.70
FH CONN
1-6"x 6"TEE
1-6"S.V.I50W
1-VALVE BOX
1-FH
2-CONC BLOCKS
10 LF 6"PVC PIPE (C-900)

℄ 2+33.50
1-8"1/8 BEND(TV)

℄ 2+38
1-8"1/8 BEND(BV)

℄ 2+41.70
℄ DMH #G-1
SPECIAL
INV=6.06 (18")
INV=6.06 (42")

℄ 2+67.70 RD"H"
STA 0+00 OL"G-1"
℄ CB #H-2
SPECIAL
INV=5.20 (18")
INV=5.20 (42")
SEE DET. 1/C-36

℄ 0+00
℄ DI #H-1 TYPE"Y-2"
INV=5.95±
SEE DET. 2/C-34
CONNECT TO EXIST 18"RCP
PLUG ABANDONED RCP W/CONC

℄ 5+11.76
FH CONN
1-8"x 6"TEE
1-6"G.V.I50W
1-VALVE BOX
1-FH
2-CONC BLOCKS
14 LF 6"PVC PIPE (C-900)

INV=5.71± (18")
EXIST OUTLET

℄ 0+84
℄ DMH #G-2
SPECIAL
INV=4.46
SEE DET. 1/C-36

℄2458.70 RD"H"(0/0.23)
(S) 0+00 SL"H-1"
(S) 2+01.8 SL"G"
℄ SMH #G-2
INV=7.42

℄(-)0+18.34 DL"G-1"
℄ DMH #G-3
SPECIAL
INV = 4.16 (42")
SEE DET. 2/C-36

℄ 5+34 (0/0.43')
(S) 2+75.30 SL"H-1"
℄ SMH #H-3
INV=8.80 (6")
INV=8.63 (8")

℄ 1+87.51 RD"F"(0/61.75')
(S) 0+00 SL"F-1"
(S) 1+98 SL"H-2"
℄ SMH #F-2
INV=5.62 (6")
INV=5.62 (8")

℄ 2+08.37 RD"F"(0/028.85')
(S) 0+84.03 SL"F-1"
℄ SMH #F-3
INV=5.90 (6")
INV=5.84 (8")

℄(-)0+42 RD"E"
BEGIN ROAD

S.L. "F-1"
SEE SHT. C-25 FOR PROFILE

℄(-)0+10(0/6.55') RD"H"
(S) 1+63.70 SL"F-1"
℄ SMH #F-1
INV=5.65 (6")
INV=5.49 (8")

℄(-)0+10(0/64')
END 8" WATER
1-8"Plug w/ 2-1/2" CO
1-Conc Block
1-3/4"Air Valve Working Press=
1-Air Valve Box

℄ 1+93.98 RD"H"
(0/0.57')
(S) 2+08.45
℄ SMH #H-2
INV=7.03 (6")
INV=6.92 (8")

℄ 2+17.19
℄ W/C RAMP

℄ 2+98
℄ CB #H-2
INV.=5.40

℄ 2+03.20
℄ CB #H-1
INV.=5.40

℄ 2+62
1-8"1/8 BEND(BV)

℄ 2+65
1-8"1/8 BEND(TV)

℄ 2+98
1-8"x 6"TEE
2-8"GV. I50W
2-VALVE BOXES
1-CONC BLOCK

℄ CB #H-3
TYPE "A"
INV=5.40

℄ 3+90
INV.=9.30(8"W)

℄ 5+14
INV.=9.70

℄ 5+24
END 8"WATER
INV.=9.70

℄ 0+00
END 8"WATER
INV.=9.80
(8"W)

℄(-)0+10
INV.=9.60
END 8"W

℄(-)0+15
(S) 1+63.70 SL"F-1"
(S) 0+00 SL"H"
℄ SMH #F-1
INV=6.65 (6")
INV=6.49 (8")

SEWER LATERAL CONNECTIONS	WATER LATERAL CONNECTIONS
℄ 0+41.70 (o/s 8.21'±)	℄ 0+10.00 (o/s 4'±)
℄ 0+57.70 (o/s 7.86'±)	℄ 0+45.70 (o/s 4'±)
℄ 0+80.77 (o/s 7.37'±)	℄ 0+74.77 (o/s 4'±)
℄ 1+43.31 (o/s 6.01'±)	℄ 0+98.70 (o/s 4'±)
℄ 1+64.33 (o/s 5.51'±)	℄ 2+00.02 (o/s 4'±)
℄ 1+93.98 (o/s 5'±)	℄ 3+24.85 (o/s 4'±)
℄ 3+18.07 (o/s 3.20'±)	℄ 3+33.57 (o/s 4'±)
℄ 3+91.43 (o/s 3.28'±)	℄ 3+97.57 (o/s 4'±)
℄ 4+43.87 (o/s 3.28'±)	℄ 4+49.92 (o/s 4'±)
℄ 5+34.00 (o/s 4'±)	℄ 5+14.99 (o/s 4'±)
	℄ 5+24.00 (o/s 4'±)

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

℄ CURVE DATA H-1
△ = 1°57'40"
△/2 = 0°58'50"
R = 318.05
T = 5.44
C = 10.89
L = 10.89

PLAN - ROAD "H"
SCALE: 1" = 40'

TURNAROUND DETAIL
SCALE: 1" = 20'

TURNAROUND DETAIL
SCALE: 1" = 20'

CURB RETURN DATA
(15)
△ = 56°47'49"
△/2 = 28°23'54.5"
R = 28.00
T = 15.14
C = 26.63
L = 27.76

CURB RETURN DATA
(14)
△ = 73°23'54"
△/2 = 36°41'57"
R = 28.00
T = 20.87
C = 33.47
L = 35.87

CURB RETURN DATA
(18)
△ = 56°37'59"
△/2 = 28°18'59.5"
R = 48.00
T = 25.86
C = 45.54
L = 47.44

CURB RETURN DATA
(19)
△ = 236°37'59"
△/2 = 118°18'59.5"
R = 32.00
C = 56.34
L = 132.16
△/10 = 23°39'47.9"

CURB RETURN DATA

(1)	(20)
△ = 90°00'	△ = 91°57'40"
△/2 = 45°00'	△/2 = 45°58'50"
R = 28.00	R = 28.00
T = 28.00	T = 28.98
C = 39.60	C = 40.27
L = 43.98	L = 44.94

℄ DATA

(1)	(20)
△ = 90°00'	△ = 64°24'18"
△/2 = 45°00'	△/2 = 32°12'09"
R = 30.00	R = 30.00
T = 30.00	T = 18.89
C = 42.43	C = 31.97
L = 47.12	L = 33.72

PROFILE - ROAD "H"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

PROFILE - DRAINLINE "G-1"
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 1/24/95

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12/19/94

APPROVED:
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) — DATE 10/12/94

APPROVED:
(FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW &S — DATE 3/15/95

CALVIN D. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 1768-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN-KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

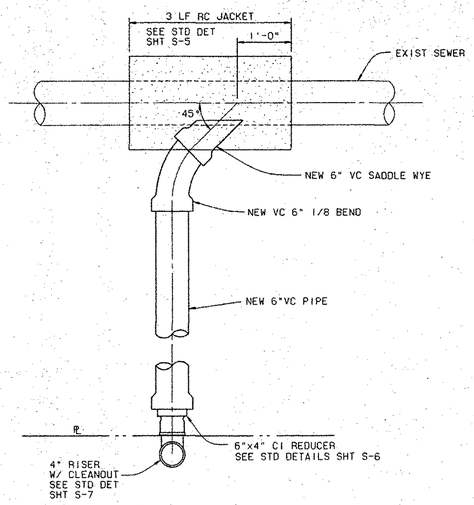
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
ROAD "H"

PROJECT NO.
DATE JULY 18, 1994
C-24

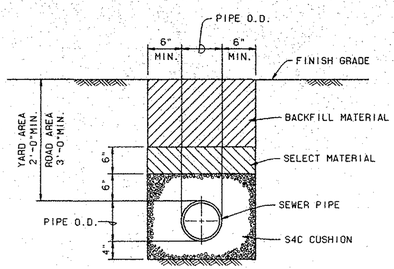
SHEET 25 OF 81 SHEETS

FILE	POCKET	FOLDER	NO.



1 C-33 DETAIL - NEW SEWER LATERAL CONNECTION TO EXIST MAIN

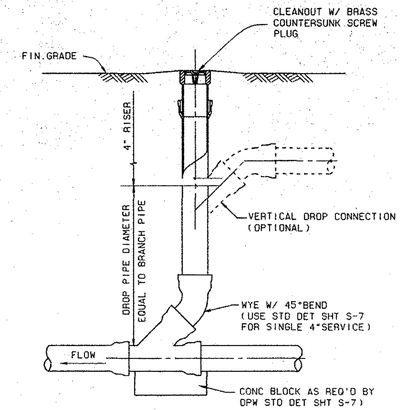
SCALE: 3/4"=1'-0"



PRIVATE SEWER

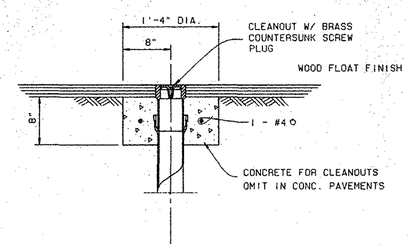
3 C-33 TYPICAL TRENCH SECTIONS (PRIVATE)

NOT TO SCALE



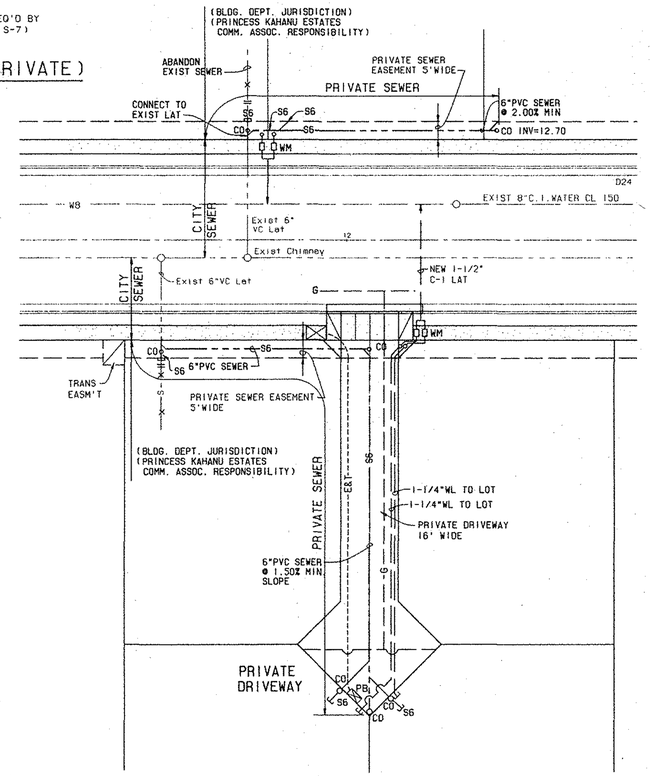
5 C-33 DETAIL - CLEANOUT (YARD AREA-PRIVATE)

SCALE: 1"=1'-0"



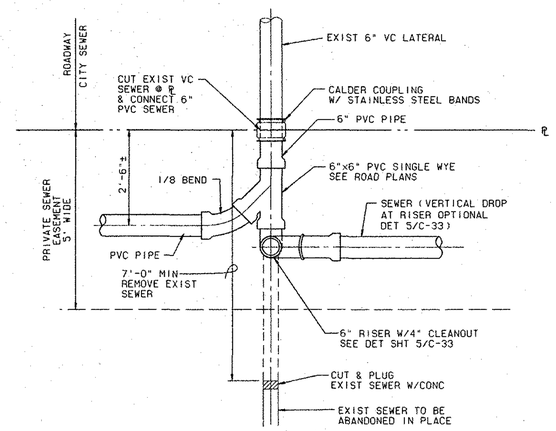
6 C-33 DETAIL - CLEANOUT IN AC PAV'T (PRIVATE)

SCALE: 1"=1'-0"



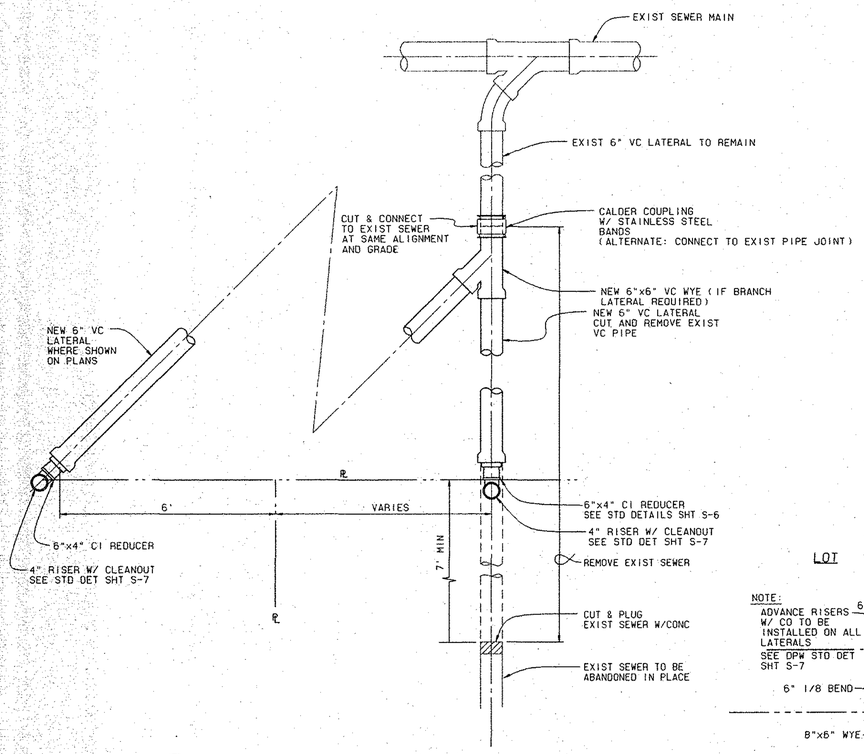
9 C-33 PLAN PRIVATE SEWER WITHIN DRIVEWAY & EASEMENTS

SCALE: 1"=20'-0"



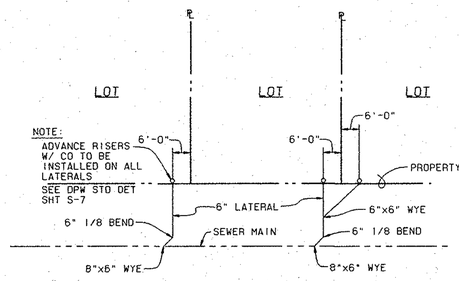
4 C-33 DETAIL - PRIVATE SEWER CONNECTION

SCALE: 1/2"=1'-0"



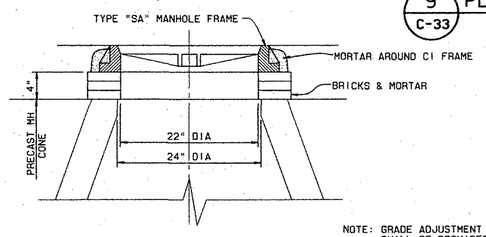
2 C-33 DETAIL - RECONSTRUCT EXIST LATERAL

SCALE: 1/2"=1'-0"



7 C-33 SEWER LATERAL LAYOUT

NOT TO SCALE



NOTE: GRADE ADJUSTMENT RINGS SHALL BE PROVIDED FOR ALL MANHOLES WITHIN C&C AC PAVEMENT AREAS

8 C-33 DETAIL - GRADE ADJUSTMENT RINGS FOR SEWER MANHOLES

SCALE: 1"=1'-0"

APPROVED:

10/12/94

CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY R/W ONLY) DATE

CALVIN D. S. KIM REGISTERED PROFESSIONAL ENGINEER No. 1768-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES
SUBDIVISION PHASE II
AT LUALUALEI, WAIANAE, OAHU, HAWAII

SEWER DETAILS

PROJECT NO.

DATE JULY 18, 1994

C-33

FILE	ROCKET	FOLDER	NO.

CONSTRUCTION PLANS FOR

PRINCESS KAHANU ESTATES SUBDIVISION

PHASE I — (POHAI STREET)

PRINCESS KAHANU AVENUE

AT LUALUALEI, WAIANAE, OAHU, HAWAII

TAX MAP KEY 8-7-07:4 AND 8-7-33:14 & 19

INSPECTOR'S COPY

Res. Engr.	TED SAITO
Inspector	DAVID NEYER
Date Final Inspection	5/31/96
Pipe	NONE
Cradle	NONE
Contractor	OAHU CONSTRUCTION

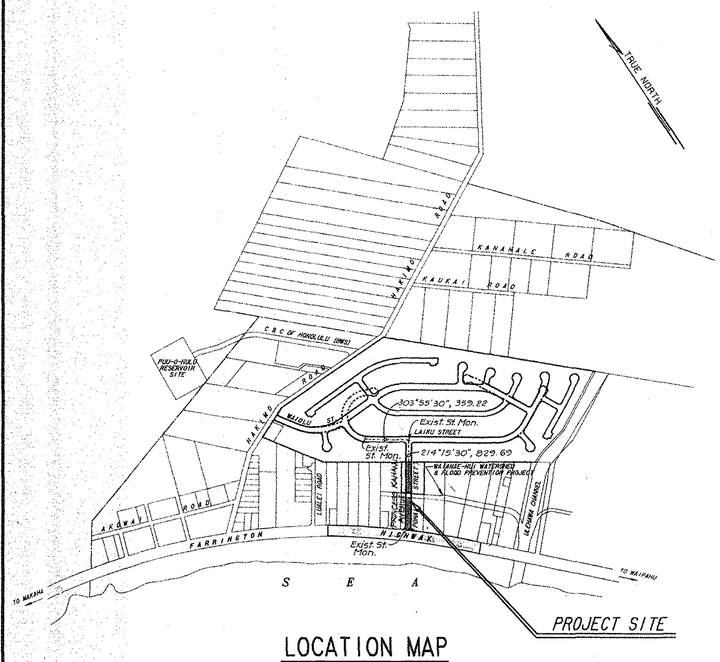
OWNER : DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

DEVELOPER : PRINCESS KAHANU DEVELOPMENT CORPORATION

OAHU CONSTRUCTION COMPANY, LTD.
3375 Koapaka St. Ste. H450
P.O. Box 20105
Honolulu, Hawaii 96820-0105

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LOCATION MAP

GRAPHIC SCALE IN FEET
500' 0 500' 1000'
1"=500'

APPROVED

Wesley L Drake — 11/23/94
DIRECTOR, DEPARTMENT OF HAWAIIAN HOME LANDS, STATE OF HAWAII — DATE

for — 2/27/95
DIRECTOR AND CHIEF ENGINEER, DEPARTMENT OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU — DATE

ACTING — 9/12/94
DIRECTOR, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU (FOR SEWER WORK WITHIN CITY RIGHT-OF-WAY ONLY) — DATE

DIRECTOR, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY RIGHT-OF-WAY ONLY) — DATE

9/6/94
MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE

for — 7/7/95
DIRECTOR, DEPARTMENT OF LAND UTILIZATION, CITY & COUNTY OF HONOLULU — DATE

for — 10/5/94
CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION, DEPARTMENT OF HEALTH, STATE OF HAWAII — DATE

for — 17 Jan 95
ADMINISTRATOR, HIGHWAYS DIVISION, STATE DEPARTMENT OF TRANSPORTATION (APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY. ID NO. O-94-42 LETTER OF APPROVAL NO. HWY-CM 2.6041 DATED 6-6-95.) — DATE

428/5

INSPECTOR'S COPY
RECORD PLAN - DO NOT DESTROY

CALVIN D. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 1758-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

FILE	POCKET	FOLDER	NO.

BWS WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, AND THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS," VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.

2. NUTS AND BOLTS FOR FLANGED CONNECTIONS WITHIN METER BOXES SHALL BE BRONZE OR STAINLESS STEEL EXCEPT COUPLING ADAPTERS WHERE "COR-TEN" (U.S. STEEL) OR "MAYARI" (BETHLEHEM STEEL) MAY BE USED. FLANGED CONNECTIONS OUTSIDE OF METER BOX MAY USE "COR-TEN" OR "MAYARI" TYPE NUTS AND BOLTS.

3. TEST PRESSURE SHALL BE ONE OF THE FOLLOWING:

   a. PREVAILING LINE PRESSURE. JOINTS LEFT EXPOSED FOR 24 HOURS TO CHECK FOR LEAKS PRIOR TO BACKFILL.

   b. 150 PSI.

4. THE CONTRACTOR SHALL CHLORINATE THE ENTIRE INSIDE SURFACE OF EACH PIPE AND FITTING WITH DISINFECTION SOLUTION OF 5 OUNCES OF SODIUM HYPOCHLORITE MIXED WITH 10 GALLONS OF WATER. (FOR CONNECTION ONLY)

5. THE PROJECT SHALL PAY THE APPLICABLE WATER SYSTEM FACILITIES AND/OR ONE-TIME SERVICE CHARGE AND FOR THE METER WHICH WILL BE FURNISHED BY BWS AND INSTALLED BY THE CONTRACTOR WHEN THE LATERAL IS INSTALLED.

6. THE CONTRACTOR SHALL NOTIFY BWS PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION, ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.

7. CONTRACTOR SHALL CUT AND PLUG ALL EXISTING UNUSED LATERALS AT THE MAIN WHETHER OR NOT SHOWN ON THE PLANS. METER AND VALVE BOXES TO BE OR ALREADY ABANDONED SHALL BE DEMOLISHED OR REMOVED AND PROPERLY DISPOSED OF. THE DAMAGED AREA SHALL BE REPAIRED TO AN EQUAL OR BETTER CONDITION THAN THE IMMEDIATE AREA. ALL WORK SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.

8. ALL PLANS APPROVED BY THE BOARD OF WATER SUPPLY ARE BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY. ALL OTHER FEATURES OF THE WATER SYSTEM, SUCH AS LINES, GRADES, FITTINGS, DRAINAGE, ETC., AND OTHER FEATURES OF IMPROVEMENTS SHALL NOT BE THE RESPONSIBILITY OF THE BOARD OF WATER SUPPLY.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WATER LINES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ESPECIALLY CAREFUL WHEN EXCAVATING BEHIND WATER LINES. TEES AND BENDS WHEREVER THERE IS A POSSIBILITY OF WATER LINE MOVEMENT DUE TO REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURE NECESSARY TO PROTECT THE WATER LINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BWS APPROVAL) AND/OR MODIFYING HIS CONSTRUCTION METHOD.

10. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES.

11. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL CAST IRON (GRAY OR DUCTILE) FITTINGS FOR THE PROJECT CONFORM IN ALL RESPECTS TO THE WATER SYSTEM STANDARDS, DATED 1985.

12. POLYGON SHAPE FOR MECHANICAL JOINT GLANDS AS DESCRIBED IN AWWA STANDARD C111 SHALL BE "STRAIGHT-SIDED" OR AN APPROVED EQUAL ON A JOB TO JOB BASIS.

13. REAPPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.

14. WATER METER/S WILL NOT BE ISSUED UNTIL THE BACKFLOW PREVENTION DEVICE IS INSTALLED.

15. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT BACKFILL HAS A RESISTIVITY GRATER THAN 5000 OHM-CM.

16. THE CONTRACTOR/DEVELOPER SHALL OBTAIN A NPDES PERMIT PRIOR TO CHLORINATION AND/OR DEWATERING. A COPY OF THE PERMIT SHALL BE SUBMITTED TO THE BOARD OF WATER SUPPLY, PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION.

17. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES AND STANDPIPES SHALL BE SUPPLIED WITH A FUSION BONDED EPOXY COATING. NO BENDING OF PVC PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE, ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS & SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS & SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE AND ALL NON-METALLIC LATERALS.

18. ALL PVC PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BE THE USE OF PVC DEFLECTION COUPLINGS.

19. ALL PVC FITTINGS FOR CLASS 150 C-900 PVC PIPES SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) C-907. ALL TYPES OF FITTINGS NOT SPECIFIED IN AWWA C-907 ARE NOT APPROVED.

20. REACTION BLOCK REQUIREMENTS FOR PVC FITTINGS SHALL BE THE SAME AS FOR DUCTILE IRON FITTINGS.

21. THE USE OF HUB CLAMPS & SET SCREWS ON PVC FITTINGS IS NOT APPROVED.

22. PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BOARD, THE MANUFACTURERS' CERTIFICATION THAT ALL PVC FITTINGS CONFORM IN ALL RESPECTS TO AWWA C-907.

23. UNLESS OTHERWISE SPECIFIED, ALL LATERALS AND CONNECTIONS SHALL BE COPPER TYPE "C-1" WITH BLIND METER SPLICE LENGTHS TO ACCOMMODATE 3/4" METERS.

24. WATER COMMITMENT SHALL BE CANCELLED IF THE APPROVED CONSTRUCTION PLANS ARE ALLOWED TO LAPSE.

25. THE CONTRACTOR SHALL FURNISH AND INSTALL DIELECTRIC COUPLINGS FOR ALL COPPER SERVICE LATERAL CONNECTIONS.

26. AT THE ELECTRICAL/SIGNAL DUCTLINE WATER CROSSINGS, ADJUST ALL ELECTRICAL/SIGNAL DUCTLINE ELEVATIONS TO MAINTAIN 6" VERTICAL CLEAR SEPARATION FROM ALL WATERLINES (12" CLEAR FOR ALL ELECTRICAL/SIGNAL DUCTLINE STRUCTURES LARGER THAN 16") AT NO COST TO THE BOARD OF WATER SUPPLY.

27. MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATER-LINE SYSTEMS AND NEAREST ELECTRICAL/SIGNAL DUCTLINES PARALLELING THE WATER SYSTEM AT NO COST TO THE BOARD OF WATER SUPPLY.

28. MAINTAIN 3'-0"MIN. HORIZONTAL CLEAR SEPARATION BETWEEN STREET LIGHT/ TRAFFIC SIGNAL STANDARDS (INCLUDING ANY MODULAR UNITS) AND THE NEAREST WATER SYSTEM. CONTRACTOR SHALL FIELD VERIFY FOR ANY CONFLICTS AT EACH STREET LIGHT/TRAFFIC SIGNAL STANDARD LOCATION. WHERE CONFLICTS OCCUR, THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER TO REVISE THE STREET LIGHT/TRAFFIC SIGNAL STANDARD TO PROVIDE THE REQUIRED CLEARANCES AT NO COST TO THE BWS.

29. THE CONTRACTOR SHALL ADJUST ALL MANHOLE FRAMES/VALVE BOXES WITHIN THE RESURFACED AREA. PRIOR TO RESURFACING, BWS WILL INITIALLY LOCATE ALL WATER MANHOLES/VALVE BOXES THAT WILL REQUIRE ADJUSTMENTS. THE CONTRACTOR SHALL THEN BE RESPONSIBLE FOR "REFERENCING" THESE MANHOLES/VALVE BOXES TO FACILITATE THE ADJUSTMENTS. THE COST FOR ADJUSTMENTS SHALL BE MADE AT THEIR RESPECTIVE UNIT PRICES IN THE BID BASED ON THE ACTUAL NUMBER ADJUSTED. COST FOR REFERENCING SHALL BE INCIDENTAL AND SHALL NOT BE PAID FOR DIRECTLY. ANY ADDITIONAL REQUEST TO BWS TO AGAIN LOCATE THE MANHOLES/VALVE BOXES SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR. (BWS WILL CHARGE AND BILL THE CONTRACTOR FOR ALL COST FOR SAID ADDITIONAL WORK).

30. ANY ADJUSTMENTS TO THE EXISTING WATER SYSTEM REQUIRED DURING CONSTRUCTION TO MEET REQUIREMENTS OF BWS STANDARDS, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE DONE BY THE CONTRACTOR AT NO COST TO THE BOARD.

31. PRIOR TO ANY EXCAVATING, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.

32. BWS WILL NOT SEND COMPLETION NOTICE TO DLU UNTIL EASEMENT DOCUMENTS ARE SUBMITTED TO BWS AND RECORDED.

33. UPON COMPLETION OF THE PROJECT, THE DEVELOPER SHALL PROVIDE THE BWS A CERTIFICATE FROM A REGISTERED SOILS ENGINEER CERTIFYING THAT THE ROAD PRISM HAS BEEN CONSTRUCTED IN ACCORDANCE TO CITY AND COUNTY ROAD STANDARDS.

34. ACCORDING TO THE SOIL RESISTIVITY AND PH TEST "PRINCESS KAHANU ESTATES SUBDIVISION" DATED APRIL 26, 1994, BY HAWAII GEOTECHNICAL GROUP, INC., THE SOIL HAS A CORROSION RATING OF "1". THE CONTRACTOR SHALL PROVIDE CORROSION PROTECTION MEASURES CONSISTENT FOR A CORROSION RATING OF "1", AS STATED IN THE BWS "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS" VOLUME 3, DATED 1991.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, SEPTEMBER 1986, THE DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS, SEPTEMBER 1984, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT VOLUME 1, JULY 1993.

2. IN THE EVENT THAT ANY CHANGES IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICTS WITH OTHER UTILITIES, THE ENGINEER IN CHARGE OR THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES WHICH ARE TO BE PRESENTED TO THE DEPARTMENT OF WASTEWATER MANAGEMENT FOR APPROVAL.

3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DEPARTMENT OF WASTEWATER MANAGEMENT, AT 527-5820 OR 523-4345, TO ARRANGE FOR INSPECTION SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN DAYS PRIOR TO COMMENCEMENT OF SEWER WORK.

4. CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED.

5. TREES IN THE ROAD RIGHT-OF-WAY SHALL BE SITUATED A MINIMUM OF 6'-0" FROM THE CITY'S SEWER LINES.

6. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA.

7. SEWER LATERAL LOCATION MEASURED ALONG THE FRONT PROPERTY LINE SHALL BE 6'-0" FROM THE PROPERTY CORNER UNLESS OTHERWISE NOTED ON THE PLANS AND SHOULD NOT STRADDLE ELECTRICAL TRANSFORMER PAD.

8. SLOPE FOR SEWER LATERALS SHALL BE 1.00% UNLESS OTHERWISE NOTED.

9. BUILDING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.

11. THE CONSULTING ENGINEER SHALL SUBMIT TO THE DEPT. OF WASTEWATER MANAGEMENT MYLAR "AS-BUILT" TRACINGS OF THE CONSTRUCTION PLANS AS ACTUALLY CONSTRUCTED, SHOWING ALL CHANGES FROM THE ORIGINAL PLANS.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES.

13. THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.

14. FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(b), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
   1. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
      a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
      b. LIFELINE AND ASSOCIATED CLIPS.
      c. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
      d. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
      e. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
      f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
      g. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
      h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
   2. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
   3. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).

15. ALL DROP AND SHALLOW DROP SEWER MANHOLES SHALL BE LINED WITH PLASTIC LINERS. ALSO, IF THE VELOCITY EXCEEDS 10 FPS, THE SEWER MANHOLE SHALL BE PLASTIC LINED.

16. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR ADVANCE SEWER RISER AGREEMENT AT THE DEPT. OF WASTEWATER MANAGEMENT AND OBTAIN PLUMBING PERMIT BEFORE ANY ADVANCE RISER IS MADE.

17. ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER.

18. SEWER PIPES 30 INCHES AND LARGER SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED INTERNALLY WITH LINING.

19. S4C PIPE CRADLE SEALS SHALL BE INSTALLED 10 FEET FROM ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION.

20. GEOTEXTILE FABRIC TO ENVELOP THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.

21. DHHL SHALL PAY TO THE CITY THE APPLICABLE WASTEWATER SYSTEM FACILITY CHARGE.

22. THE PRINCESS KAHANU ESTATES COMMUNITY ASSOCIATION SHALL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE SEWER SYSTEM OUTSIDE OF THE PUBLIC ROAD RIGHT-OF-WAY.

23. THE DEPARTMENT OF HAWAIIAN HOMELANDS (DHHL) SHALL GRANT AN EASEMENT IN FAVOR OF THE CITY AND COUNTY OF HONOLULU THROUGH A LICENSE AGREEMENT FOR MAINTENANCE OF THE SEWER SYSTEM WITHIN THE ROADWAY EASEMENT RIGHT-OF-WAY.

TRAFFIC NOTES

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK IS STARTED ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY. SUBMIT A SET OF APPROVED CONSTRUCTION PLANS WHEN APPLYING FOR THE PERMIT.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATIVE RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS IN THE STATE OF HAWAII", ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," PART VI, "TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".

3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.

4. DURING NON-WORK HOURS ONE LANE SHALL BE OPEN AND ALL EXCAVATIONS ON CITY AND COUNTY ROADS SHALL BE COVERED WITH A SAFE, NON-SKID BRIDGING MATERIAL.

5. ~~THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT LEAST FIVE (5) WORKING DAYS PRIOR TO REMOVAL OF ANY EXISTING CITY TRAFFIC CONTROL SIGN OR DEVICE.~~

6. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL DRIVEWAYS DURING WORK AND NON-WORK HOURS OR MAKE OTHER ARRANGEMENTS TO THE SATISFACTION OF THE AFFECTED RESIDENTS.

7. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL HIRE SPECIAL DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.

8. A ROADWAY MAY BE CLOSED ONLY WITH THE EXPRESS PERMISSION OF THE DEPARTMENT OF TRANSPORTATION SERVICES.

9. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTION SHALL ALSO BE PROVIDED.

10. THE CONTRACTOR SHALL REFERENCE, TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES, ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT 523-4029 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POSTS AND PAVEMENT MARKINGS.

11. IF UNABLE TO PROVIDE ONE LANE, THE CONTRACTOR SHALL AT LEAST THREE WEEKS (3) PRIOR TO THE CLOSURE, SUBMIT A TRAFFIC CONTROL PLAN TO THE DEPARTMENT OF TRANSPORTATION SERVICES FOR APPROVAL.

12. THE CONTRACTOR SHALL ALSO PROVIDE AND ERECT, AT LEAST ONE WEEK PRIOR TO THE ROAD CLOSURE, TWO SIGNS INFORMING THE PUBLIC OF THE IMPENDING WORK. THE SIGNS SHALL BE APPROXIMATELY 4 FEET BY 8 FEET IN SIZE AND SHALL INCLUDE THE DATE WHEN WORK IS TO COMMENCE AND THE HOURS OF THE CLOSURE: 8:00 AM TO 3:30 PM. THE SIGNS SHALL BE ERECTED AT BOTH APPROACHES TO THE ROADWAY.

13. THE TRAFFIC CONTROL PLAN MAY BE ADJUSTED AS FIELD CONDITIONS WARRANT, UPON THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES.

14. THE CONTRACTOR SHALL NOTIFY OTS, ED SNIFFEN OR TRASK HUDDY, AT 848-4571, TWO WEEKS PRIOR TO CONSTRUCTION, INFORMING THEM OF LOCATION, SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUS STOP.

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1984, AS AMENDED, AND THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU.

2. ALL EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.

3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 527-6311 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.

4. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

5. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION ACTIVITY SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OF FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE COSTS INCURED FOR ANY REMIDIAL ACTION BY THE CHIEF ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMITY WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.

7. BENCH MARKS SHALL BE ESTABLISHED ON NEW STREET MONUMENTS AND THE DATA SUBMITTED TO THE DIVISION OF ENGINEERING.

8. ALL EXISTING IMPROVEMENTS WITHIN THE CITY'S JURISDICTION OR CITY MAINTAINED ROAD R/W THAT ARE DISTURBED DURING THE CONSTRUCITON PHASE SHALL BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION AT NO COST TO THE CITY.

STREET NAME SIGNS

1. STREET NAME SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE DEPARTMENT OF TRANSPORTATION SERVICES. THE EXACT LOCATION SHALL BE DETERMINED BY THE DIRECTOR OF TRANSPORTATION SERVICES. IN LIEU OF THE STANDARD EMBOSSED SIGNS, REFLECTORIZED STREET NAME SIGNS AND SIGN BRACKETS IDENTICAL TO THAT PRESENTLY USED BY THE DEPARTMENT OF TRANSPORTATION SERVICES MAY BE INSTALLED.

ELECTRICAL AND MAINTENANCE SERVICE DIVISION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.

2. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE STREET LIGHTING SYSTEM (PHONE 527-5002).

3. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE 527-5007).

4. STREET LIGHTING AND TRAFFIC SIGNALS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION OR CHANGEOVER REQUIRED SHALL BE APPROVED BY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES AND PERFORMED AND PAID FOR BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING STREET LIGHTING AND TRAFFIC SIGNAL FACILITIES AND DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY & COUNTY OF HONOLULU.

APPROVED: (FOR CONSTRUCTION WITHIN CITY R/W ONLY)
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU — DATE 12/6/94

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 8-11-94

APPROVED: (FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU — DATED 9/9/94

APPROVED: FOR GRADING AND CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY
CHIEF, DIVISION OF ENGINEERING, DPW, CCH — DATE 4/3/95

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

PRINCESS KAHANU ESTATES SUBDIVISION
PHASE I -(POHAI STREET)
PRINCESS KAHANU AVENUE
AT LUALUALEI, WAIANAE, OAHU, HAWAII

CONSTRUCTION NOTES

PROJECT NO. — DATE: JULY 18, 1994 — C-1

SHEET 2 OF 11 SHEETS

FILE	POCKET	FOLDER	NO.

NOTE: 1) ALL EXISTING SEWERS AND DRAINS SHALL BE CLEANED AND REPAIRED TO THE SATISFACTION OF THE CITY.
2) WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.
3) SEWER EASEMENT TO BE GRANTED TO THE CITY & COUNTY OF HONOLULU OVER DHHL ROADWAYS.
4) SIDEWALK AREA ALONG PRINCESS KAHANU AVE TO BE MAINTAINED BY PRINCESS KAHANU ESTATES COMM. ASSOCIATION.

TRUE NORTH
SCALE: 1" = 20'

PRINCESS KAHANU AVENUE
PLAN - (POHAI STREET) (DHHL ROAD CITY MAINTAINED)
SCALE: 1" = 20'

CURB RETURN DATA

(24)
Δ = 37°54'59"
Δ/2 = 18°57'29.5"
R = 28.00
C = 18.19
T = 9.62
L = 18.53

R DATA

(23) Δ = 66°45'00" Δ/2 = 33°22'30" R = 30.00 C = 33.01 T = 19.76 L = 34.95

(24) Δ = 83°10'30" Δ/2 = 41°35'15" R = 30.00 C = 39.83 T = 26.62 L = 43.55

LOT 273 WATERFLOW REQUIREMENTS

DOMESTIC	-	29 FIXTURE UNITS 40 GPM	500 GPD
IRRIGATION	-	40 GPM	500 GPD
TOTALS		40 GPM	1,000 GPD

NOTE: IRRIGATION TO BE DONE AFTER WORKING HOURS (7:00 P.M.)

SEWER DESIGN DATA (PRINCESS KAHANU ESTATES)

LAND USE	HOMES/ACRES	TRIBUTARY EQUIVALENT POPULATION
SINGLE-FAMILY HOME	271 HOMES	1,084
CHILD CARE CENTER		100
ADMIN BUILDING	0.1 ACRES	4
	TOTAL =	1,188

DESIGN DATA
AVE Q = 0.131 MGD DRY W I/I = 0.042 MGD
MAX FF = 1.056 MGD WET W I/I = 0.056 MGD
MAX Q = 0.467 MGD PEAK Q_p = 0.523 MGD

SEWER HYDRAULIC DATA
Q_R = 0.52 MGD n = 0.015
Q_A = 1.06 MGD d_n = 0.50 ft
V_R = 2.15 fps
V_A = 2.07 fps

PRINCESS KAHANU AVENUE
PROFILE - (POHAI STREET)
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

CURB RETURN DETAIL
SCALE: 1" = 20'

NOTE: CURB RETURN ELEVATIONS SHOWN ARE FOR FULL HEIGHT OF CURB. ADJUST FOR WHEELCHAIR RAMPS.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 12/6/94

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 1-30-95

APPROVED: (FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIV. OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU — DATE 9/9/94

APPROVED:
FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY
CHIEF, DIVISION OF ENGINEERING, DPW, CITY & COUNTY OF HONOLULU — DATE 2/2/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION
PRINCESS KAHANU AVENUE
PHASE I - (POHAI STREET)
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED

PLAN AND PROFILE
(POHAI STREET)
PRINCESS KAHANU AVENUE

PROJECT NO. | DATE JULY 16, 1994 | C-3

SHEET 4 OF 11 SHEETS

FILE	POCKET	FOLDER	NO.

TRUE NORTH
SCALE: 1" = 20'

PRINCESS KAHANU ESTATES SUBDIVISION
PHASE II IMPROVEMENTS
(BOUND SEPARATELY)

PHASE I

RESURFACE EXISTING A.C. PAV'T.

NOTE: WATER EASEMENT TO BE GRANTED TO THE BOARD OF WATER SUPPLY OVER DHHL ROADWAYS.

℄ 4+10 MATCH LINE (SEE SHT. 4)

PRINCESS KAHANU AVENUE (POHAI STREET)

REMOVE EXIST 4'C.L.FENCE (333 LF) & CONSTRUCT NEW CMU WALL 6' HIGH

℄ 4+82 EXIST "B"LAT CUT & PLUG AT MAIN

℄ 4+90± EXIST FH# L2790 TO REMAIN

℄ 5+90± ℄ EXIST CB B-1 TYPE"E" INV=8.50±(EXIST 18")

EXIST CMU WALL W/ C.L.FENCE TO REMAIN

EXIST CONC SIDEWALK TO REMAIN

Exist Conc S/W

Exist Conc Curb & Gutter

CUT & PLUG

ADJUST VB

EXIST ARV

214°15'30" — 829.68 Mon. to Mon.

EXIST A.C. PAV'T

EXIST 8" C.I. WATER CL 150

EXIST 12" V.C. SEWER

Exist Conc Curb & Gutter To Remain

CUT & PLUG AT TEE

CITY SEWER

NEW CONC CURB GUTTER & S/W

EXIST 18"RCP CL IV

PROJECT LIMIT PHASE I
END RESURFACING
PROVIDE SMOOTH RIDING CONNECTION

EXIST 48"RCP CL III

Exist Conc S/W to Remain

END NEW SIDEWALK MATCH INTO EXIST S/W

NEW C-1 LAT

NEW 6"PVC SEWER @ 2.00% MIN

CUT & PLUG

Remove Exist HECO PB

Remove (2)Exist HTCO PB

NEW 6"PVC SEWER 104 LF@1.50%MIN

NEW 6"PVC SEWER 60 LF @ 2.00%MIN

℄ 5+44.50±(o/s 5'±)
℄ EXIST SMH #1-2
INV=(-10.14±
ADJUST MH FRAME & COVER
SEE C&C STD DET S-25
EXIST TOP=12.56±
NEW TOP=12.64

℄ 5+90±
℄ EXIST CB #A-1 TYPE F
INV=7.64±(18")
INV=5.39±(48")
ADJUST MH FRAME & COVER

DEMOLISH EXIST D/W
CONSTRUCT NEW CONC CURB,GUTTER & SIDEWALK MATCH EXIST CURB, GUTTER AND S/W ELEV

℄ 4+70± EXIST 6"LAT INV=4.56± INSTALL ℄"RISER W/ CO CONNECT NEW PVC SEWERS

℄ 4+65 EXIST "C-1"LAT RELOCATE AND MODIFY TO "B" LAT

PRIVATE SEWER

PRIVATE SEWER EASEMENT (BLDG. DEPT. JURISDICTION)

PRIVATE SEWER EASEMENT 5' WIDE IN FAVOR OF LOTS 268, 269, 270, 271, 272 & 158.

STA 6+28 END PHASE I ROADWAY IMPROVEMENTS

271 270 269 268 159 158 157 160

PRINCESS KAHANU
℄ 8+24.69 (POHAI)
℄ 6+47.02 LAIKU
℄ EXIST SMH #1-3
INV=4.60(8")
INV=0.91(10")
INV=0.66(12")

LAIKU STREET

℄ 8+12.68±(POHAI)PRINCESS KAHANU (o/s 17.20'±)

℄ 6+59.10± LAIKU
℄ EXIST DMH A-1
INV=8.49±(18")
INV=7.74±(30")
INV=6.49±(48")

℄ 7+40± EXIST FH #L2791

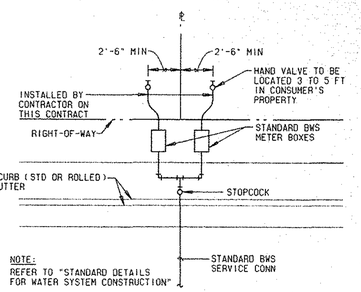
309°55'30" 359.22 (EXIST 5'C MON) EXIST 5'C

309°55'30" 759.60 (EXIST 5'C MON. TO EXIST 5'C MON)

℄ 8+52.19± (POHAI)PRINCESS KAHANU
℄ EXIST CB #E-1 TYPE"E"
INV=8.17±

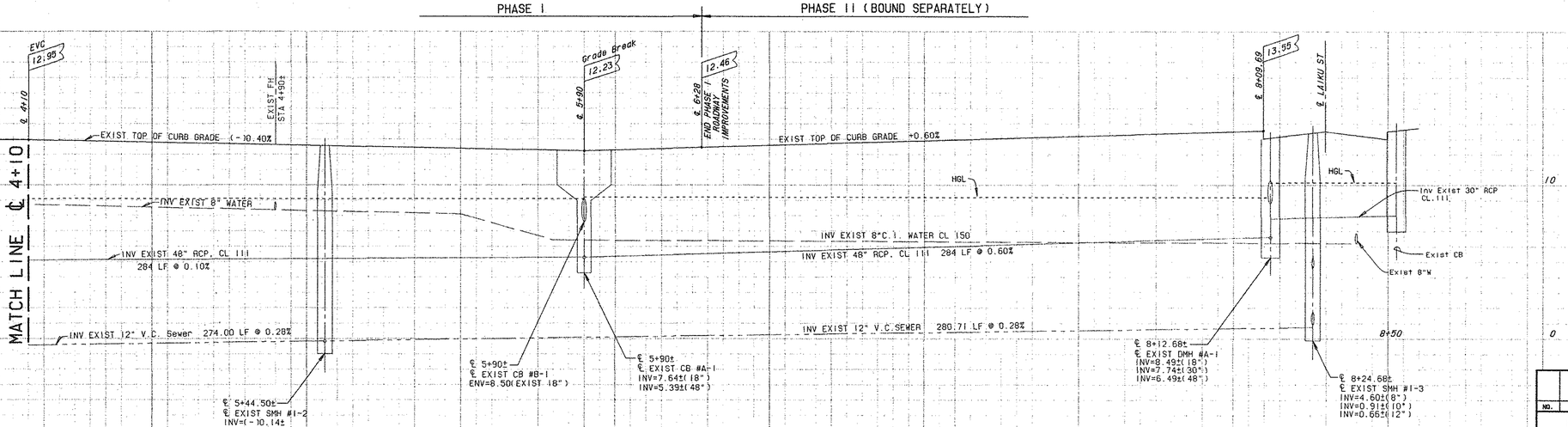
BENCH MARK
℄ 8+29.69 (POHAI)PRINCESS KAHANU
℄ 6+42.02"LAIKU"
(CO.STA.10+21.92 LAIKU NANAKULI PDH)
EXIST ST MON
TOP PIN ELEV = 13.31
ADJUST C.I.FRAME & COVER

TYPICAL WATER LATERAL DETAIL
NOT TO SCALE

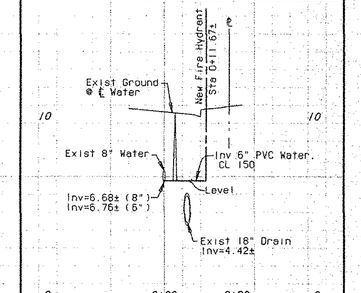


PLAN -(POHAI STREET) PRINCESS KAHANU AVENUE
SCALE: 1" = 20'

PHASE I — PHASE II (BOUND SEPARATELY)



PROFILE -(POHAI STREET) PRINCESS KAHANU AVENUE
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.



PROFILE - FH CONNECTION AT STATION 1+39.84
SCALE: 1" = 20' HORIZ.
1" = 4' VERT.

APPROVED:
CHIEF, TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY) — DATE 12/6/94

APPROVED:
CHIEF, PLANNING & ENGINEERING, BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU — DATE 12-30-94

APPROVED: (FOR SEWER WORK WITHIN CITY R/W ONLY)
CHIEF, DIV OF PLANNING & SERVICE CONTROL, DEPARTMENT OF WASTEWATER MANAGEMENT, CITY & COUNTY OF HONOLULU — DATE 9/9/94

APPROVED: FOR CONSTRUCTION WITHIN STATE DHHL-CITY MAINTAINED R/W ONLY
CHIEF, DIVISION OF ENGINEERING, DPW, CITY & COUNTY OF HONOLULU — DATE 1/26/95

CALVIN D. S. KIM — REGISTERED PROFESSIONAL ENGINEER — No. 1768-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

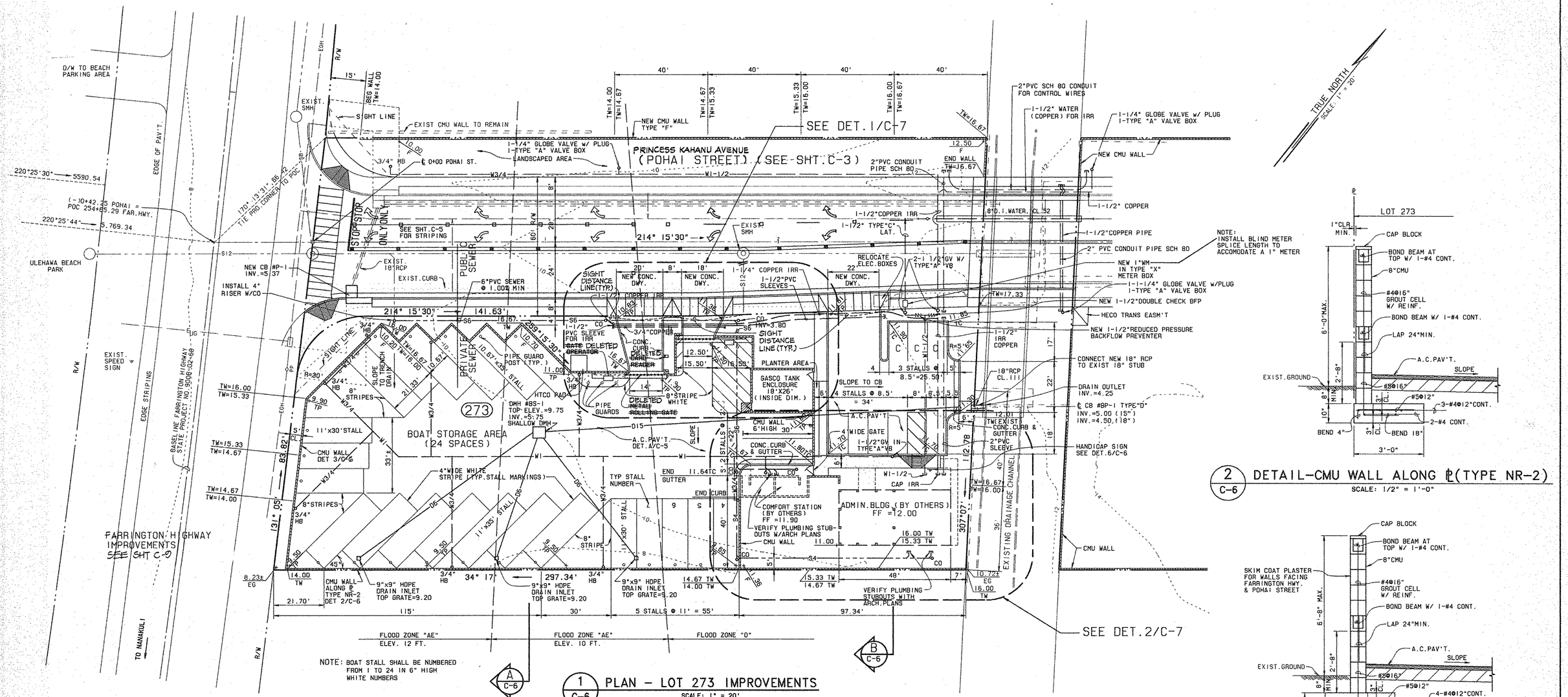
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION
PHASE I -(POHAI STREET) PRINCESS KAHANU AVENUE
AT LUALUALEI, WAIANAE, OAHU, HAWAII
PROPOSED DHHL ROADWAY
CITY MAINTAINED
PLAN AND PROFILE (POHAI STREET) PRINCESS KAHANU AVENUE

PROJECT NO. | DATE: JULY 16, 1994 | C-4

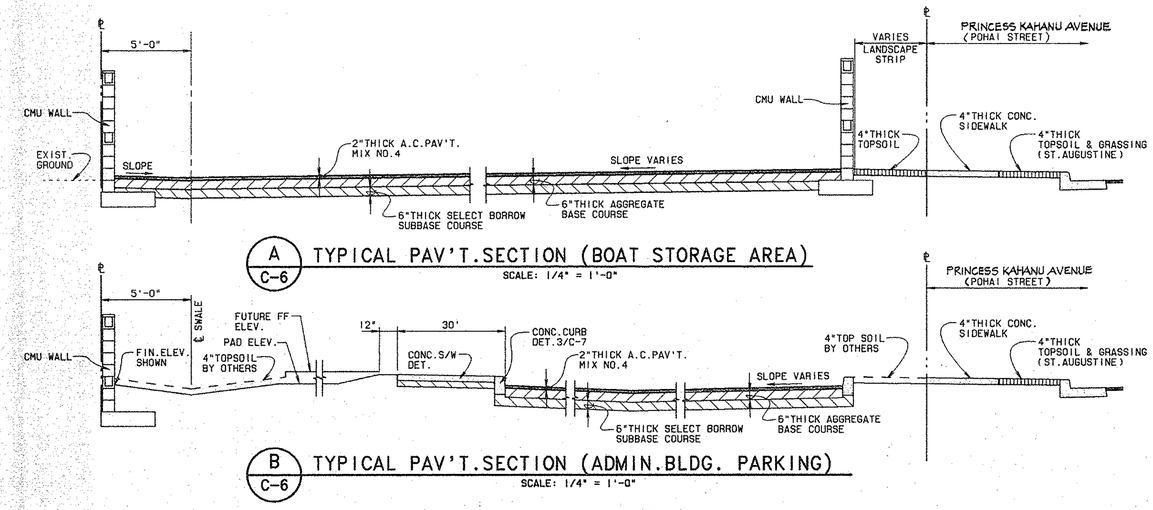
SHEET 5 OF 11 SHEETS

FILE | POCKET | FOLDER | NO.



1/C-6 PLAN – LOT 273 IMPROVEMENTS

SCALE: 1" = 20'



A/C-6 TYPICAL PAV'T.SECTION (BOAT STORAGE AREA)

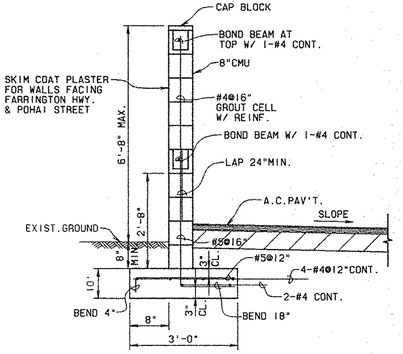
SCALE: 1/4" = 1'-0"

B/C-6 TYPICAL PAV'T.SECTION (ADMIN.BLDG. PARKING)

SCALE: 1/4" = 1'-0"

2/C-6 DETAIL–CMU WALL ALONG ℄ (TYPE NR-2)

SCALE: 1/2" = 1'-0"



3/C-6 DETAIL–CMU WALL (TYPE NR-1)

SCALE: 1/2" = 1'-0"

EARTHWORK SUMMARY:

EXC. = 305 C.Y.
EMB. = 67 C.Y.
AREA GRADED = 0.74 AC.

NOTE: THE EARTHWORK QUANTITIES SHOWN ARE FOR GRADING PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL EARTHWORK QUANTITIES.

APPROVED:
(FOR SEWER WORK WITHIN CITY R/W ONLY)
9/9/94
CHIEF, DIV OF PLANNING & SERVICE CONTROL DATE
DEPARTMENT OF WASTEWATER MANAGEMENT
CITY & COUNTY OF HONOLULU

APPROVED:
CHIEF, PLANNING AND ENGINEERING DATE 9-16-94
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

APPROVED:
(FOR GRADING & DRAIN CONNECTION ONLY)
CHIEF, DIVISION OF ENGINEERING, DPW DATE 12/8/95
CITY & COUNTY OF HONOLULU

CALVIN O. S. KIM
REGISTERED PROFESSIONAL ENGINEER
No. 1768-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
CALVIN KIM & ASSOC., INC.

NO.	REVISION	DATE	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
HONOLULU, HAWAII

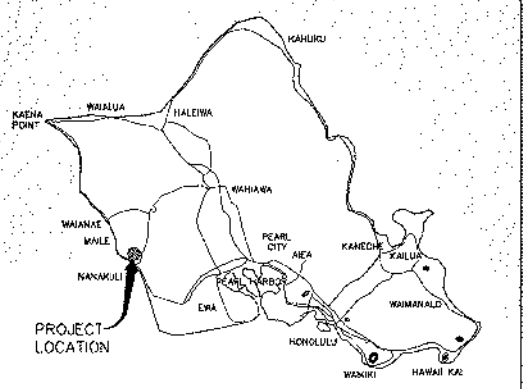
CALVIN KIM & ASSOCIATES, INC.
CIVIL ENGINEERS

PRINCESS KAHANU ESTATES SUBDIVISION PHASE I –(POHAI STREET)
PRINCESS KAHANU AVENUE
AT LUALUALEI, WAIANAE, OAHU, HAWAII

PLAN–LOT 273 IMPROVEMENTS

PROJECT NO.
DATE JULY 16, 1994
C-6

FILE	POCKET	FOLDER	NO.



VICINITY MAP

BOARD OF WATER SUPPLY

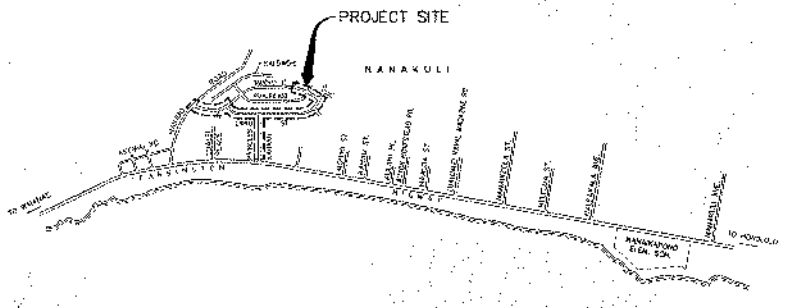
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS

NANAKULI, OAHU, HAWAII

TMK: 8-7-33, 42 AND 43

PREPARED BY
HAWAII PACIFIC ENGINEERS, INC.
1132 BISHOP ST., SUITE 1003
HONOLULU, HAWAII 96813



LOCATION MAP
NOT TO SCALE

INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET, VICINITY MAP, LOCATION MAP, AND INDEX OF DRAWINGS
2	CONSTRUCTION NOTES
3	CONSTRUCTION NOTES
4	WATER SERVICE TABLE AND CONNECTION SCHEDULE
5	GENERAL LAYOUT PLAN
6	PLAN AND PROFILE W.L. "A" STA. 0+00 TO STA. 4+00
7	PLAN AND PROFILE W.L. "A" STA. 4+00 TO STA. 8+00
8	PLAN AND PROFILE W.L. "A" STA. 8+00 TO STA. 12+00
9	PLAN AND PROFILE W.L. "A" STA. 12+00 TO STA. 16+00
10	PLAN AND PROFILE W.L. "A" STA. 16+00 TO STA. 20+00
11	PLAN AND PROFILE W.L. "A" STA. 20+00 TO STA. 24+00
12	PLAN AND PROFILE W.L. "A" STA. 24+00 TO END
13	PLAN AND PROFILE W.L. "B" STA. (-)0+21.14 TO END
14	PLAN AND PROFILE W.L. "BB" AT STA. 2+20 W.L. "B", CONNECTION SCHEMATICS AND MISCELLANEOUS DETAIL
15	PLAN AND PROFILE W.L. "C" STA. 0+00 TO END
16	PLAN AND PROFILE W.L. "D" STA. 0+00 TO END
17	WATER LINE PROFILES AND FIRE HYDRANT LATERAL PROFILES
18	FIRE HYDRANT LATERAL PROFILES
19	CONNECTION SCHEMATICS
20	MISCELLANEOUS DETAILS
21	WHEELCHAIR RAMP DETAIL PLAN
22	WHEELCHAIR RAMP DETAIL PLAN
23	WHEELCHAIR RAMP DETAIL PLAN
24	WHEELCHAIR RAMP DETAIL PLAN
25	WHEELCHAIR RAMP DETAIL PLAN AND TYPICAL RAMP DETAILS
26	WHEELCHAIR RAMP DETAILS – DIMENSIONS
27	WHEELCHAIR RAMP DETAILS – DIMENSIONS
28	WHEELCHAIR RAMP DETAILS – DIMENSIONS
29	PAVING PLAN
30	PAVING PLAN
31	RESTRIPING NOTES AND DETAILS

APPROVED: **DATE:**

Howard H. Iwasaki 7/5/02

for MANAGER & CHIEF ENGINEER
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

AS-BUILT PLANS

☐ FINAL INSPECTION DATE: 3/4/05

☐ NO FINAL INSPECTION; PLACED IN SERVICE:

INSPECTED BY: D. Kraus

SUPERVISOR: K. Tuiki

CLASS OF PIPE: 8"

TYPE OF PIPE: DI

02-031A

FILE: ___ POCKET: ___ FOLDER: ___ NUMBER: ___

SHEET 1 OF 31 SHEETS

JOB 02-031A LAIKU STREET WATER SYSTEM IMPROVEMENTS

WATER NOTES: (REV. 3/15/01)

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1986, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.

2. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.

3. PAYMENT FOR ITEMS OF WORK CALLED FOR IN THE PLANS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL AND NO ADDITIONAL COMPENSATION SHALL BE MADE.

4. THE CONTRACTOR IS ALERTED TO THE ENCOUNTERING OF OBSTACLES WHETHER SHOWN ON THE PLANS OR NOT, OR WHICH MAY DIFFER IN LOCATION FROM THAT SHOWN ON THE PLANS WHICH MAY INTERFERE WITH HIS NORMAL METHOD OF OPERATIONS. THE CONTRACTOR SHALL TAKE INTO ACCOUNT ANY ADDITIONAL COSTS ANTICIPATED DUE TO THESE CONDITIONS AND SHALL HAVE THESE COSTS INCLUDED IN THE BID ITEMS WHICH HE/SHE FEELS MOST APPROPRIATE. NO SEPARATE ADDITIONAL COMPENSATION SHALL BE MADE.

5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS HE/SHE MAY MAKE OR DERIVE FROM THE SUBSURFACE INFORMATION OR DATA FURNISHED ON THE PLANS. THE CONTRACTOR MUST SATISFY HIMSELF/HERSELF THROUGH HIS/HER OWN INVESTIGATIONS AS TO WHAT SUBSURFACE CONDITIONS ARE TO BE ENCOUNTERED.

6. PRIOR TO START OF EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL AGENCIES AND UTILITIES AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL OF HIS/HER CONSTRUCTION AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE PROTECTION OF EXISTING UTILITIES AND STRUCTURES.

7. THE CONTRACTOR SHALL EXPOSE, VERIFY AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO EXCAVATION OF PIPELINE TRENCH. THE WATER MAIN ALIGNMENT AND GRADE MAY BE CHANGED IF THERE ARE CONFLICTS WITH ANY EXISTING UNDERGROUND UTILITIES AND STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT; PAYMENT FOR WORK INCLUDED IN THIS PARAGRAPH SHALL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE ITEMS OF THE PROPOSAL, AND NO ADDITIONAL COMPENSATION SHALL BE MADE. IF THE CONTRACTOR ELECTS NOT TO EXPOSE AND VERIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO PIPELINE EXCAVATION, THE CONTRACTOR FORFEITS ALL RIGHTS FOR ANY CLAIMS FOR COMPENSATION CAUSED BY ANY CONFLICTS WITH EXISTING UTILITIES AND STRUCTURES.

8. EXISTING UTILITIES CROSSING THE WATER MAIN ARE TO REMAIN IN SERVICE AND IN PLACE. IF RELOCATED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE FOR A REASONABLE PERIOD OF TIME AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE BOARD OF WATER SUPPLY.

9. ANY COST INCURRED BY GASCO, HECO, OR VERIZON HAWAII BY THIS PROJECT SHALL BE PAID BY THE BOARD OF WATER SUPPLY THROUGH THE CONTRACTOR. PAYMENT SHALL BE ONLY FOR THE ACTUAL COST AS SHOWN ON THE UTILITY COMPANY'S INVOICE. NO PAYMENT WILL BE MADE FOR PROFIT, TAX, OVERHEAD, AND BOND COST.

10. PAYMENT FOR RESTORATION OF DRIVEWAYS, CURBS AND GUTTERS SHALL NOT BE MADE DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL.

11. RESTORATION OF PAVEMENT SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND DONE WITH EQUIVALENT TO OR BETTER QUALITY MATERIALS. ALL A.C. AND CONCRETE PAVEMENT TO BE TRENCHED (FOR PIPELINE OR ANY WATER SYSTEM INSTALLATION) SHALL BE "SAW-CUT" TO THE REQUIRED WIDTH PRIOR TO REPAVING.

12. UNLESS OTHERWISE SPECIFIED, CONNECTIONS TO EXISTING WATER MAINS AND CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH THE BOARD OF WATER SUPPLY'S INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT THE EWS MAINTENANCE UNIT, ENGINEERING CONSTRUCTION SECTION.

13. WHEREVER CONNECTIONS TO EXISTING MAINS ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING MAINS PRIOR TO EXCAVATION OF MAIN TRENCH. THE REMAINING EXCAVATION FOR THE CONNECTION SHALL BE EXCAVATED WHEN THE CONTRACTOR IS READY TO MAKE THE CONNECTION.

14. ALL WATER MAIN TRENCHES SHALL BE BACKFILLED AS CALLED FOR UNDER PART XI, SECTION F.2.2, TRENCH BACKFILL OF THE "WATER SYSTEM STANDARDS", DATED 1985. COMPACTION OF TRENCH BACKFILL SHALL MEET APPLICABLE REQUIREMENTS OF "THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE COMBINED OF THE STATE OF HAWAII, OR THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS FOR PROJECTS WITHIN STATE HIGHWAYS.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL EFFLUENT ASSOCIATED WITH THE CONSTRUCTION ACTIVITY AND THE DISINFECTION AND HYDROTESTING OPERATIONS TO SAFEGUARD PUBLIC HEALTH AND SAFETY IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS. ALL PERMITS AND LICENSES FOR CONSTRUCTION WATER DISPOSAL, INCLUDING ALL APPLICATIONS, CHARGES, FEES, AND TAXES, ARE THE RESPONSIBILITY OF THE CONTRACTOR.

16. SHOULD MAJOR TREE ROOTS 2" AND GREATER BE ENCOUNTERED DURING CONSTRUCTION, THESE ROOTS SHALL BE CUT AND SEALED WITH ASPHALTIC PAINT.

WATER NOTES (CONTINUED):

17. DURING NON-WORKING HOURS, THE TRENCHES ON STREETS SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC. TEMPORARY STEEL PLATES FOR VEHICULAR TRAFFIC SHALL BE FLUSH AND/OR PROVIDE SMOOTH RAMP CONNECTION WITH ADJOINING PAVEMENT OR SIDEWALK. NO BUMPS OR ELEVATED STEEL PLATES SHALL BE ALLOWED.

18. UNLESS OTHERWISE SPECIFIED, ALL ABANDONED LINES SHALL BE CUT AND PLUGGED WITH CLASS B/WS 3000 CONCRETE. PAYMENT FOR CUTTING AND PLUGGING SHALL NOT BE MADE DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL. THE CONTRACTOR SHALL VERIFY THE SIZE AND TYPE OF LINE TO BE PLUGGED.

19. ALL WATER MAINS AND APPURTENANCES INCLUDING SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE SUBJECTED TO A HYDROSTATIC TEST PRESSURE OF 150 PSI, BY THE CONTRACTOR IN THE PRESENCE OF THE BOARD OF WATER SUPPLY INSPECTOR.

20. ALL LATERALS SHALL BE REPLACED OR RECONNECTED WITH COPPER TUBING.

21. PAYMENT FOR SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE MADE AT THE LUMP SUM BID IN THE PROPOSAL. PAYMENT SHALL INCLUDE TAGS INTO MAINS, RECONNECTIONS TO EXISTING SERVICES, TRANSFERAL OF METERS, AND INSTALLING PIPE LATERALS, FITTINGS, BALL CORPS, BALL STOPS, GLOBE VALVES, METER SPACER, BRASS PIPES, CAPS, 3/4" PVC SCH-80 OR CONDUIT FOR MULTIPLE METER BOXES, AND ALL APPURTENANCES, AS REQUIRED, IN PLACE COMPLETE. PAYMENT FOR METER BOXES, INCLUSIVE OF C.I. FRAMES AND COVERS AND TYPE "A" VALVES BOXES, SHALL BE MADE AT THE RESPECTIVE UNIT PRICE BID IN THE BID. BALL CORPS AND BALL STOPS SHALL BE INSTALLED IN LIEU OF THE CORPORATION STOPS AND STOPCOCKS, RESPECTIVELY.

22. DEMOLISH AND BACKFILL ALL ABANDONED MANHOLES, VALVE BOXES AND METER BOXES. SALVAGE ALL CAST IRON FRAMES, COVERS AND FIRE HYDRANTS. FOR WATERPROOFED MANHOLES, DRILL HOLES IN WALLS AND FLOOR SLABS FOR DRAINAGE FLOW, AS REQUIRED. ALL SALVAGE MATERIALS SHALL BE CLEANED, REPAINTED AND DELIVERED TO THE KALIHI EWS CORPORATION YARD.

23. AFTER INSTALLATION OF TAPPING SLEEVE AND TAPPING VALVE AND PRIOR TO TAPPING THE EXISTING WATER MAIN, THE ASSEMBLY SHALL BE PRESSURE TESTED AT 150 PSI, ON BOTH SIDES OF THE VALVE AND IN ACCORDANCE WITH THE WATER SYSTEM STANDARDS, DATED 1985.

24. THE NEW WATER MAIN SHALL BE COMPLETED IN PHASES AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL COMPLETE EACH PHASE INCLUDING INSTALLATION AND TESTING OF THE WATER MAIN, TRANSFER OF SERVICES AND FINAL PAVING OF THE STREET PRIOR TO BEGINNING THE NEXT PHASE; HOWEVER, THE CONTRACTOR MAY COMMENCE WORK ON THE NEXT PHASE UPON SATISFACTORY PROGRESS OF ALL REMAINING WORK ON THE PREVIOUS PHASE AS APPROVED IN WRITING BY BWS.

25. THE CONTRACTOR SHALL INSTALL FIRE HYDRANT REFLECTIVE MARKERS. PAYMENT FOR INSTALLATION OF REFLECTIVE HYDRANT MARKERS SHALL BE MADE AT THE RESPECTIVE UNIT PRICE IN THE PROPOSAL.

26. MECHANICAL JOINT GLANDS SHALL BE "STRAIGHT-SIDED", POLYGON IN SHAPE, AND DUCTILE IRON GLAND THICKNESS SHALL MEET OR EXCEED GRAY IRON GLAND THICKNESS AS DESCRIBED IN AWWA C115. REDUCED METAL GLAND SECTION THICKNESS IS NOT PERMITTED.

27. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL PIPES, FITTINGS, SPECIAL CASTINGS, AND VALVES CONFORM IN ALL RESPECTS TO THE WATER SYSTEM STANDARDS.

28. ALL AIR RELIEF VALVES SHALL HAVE A MINIMUM WORKING PRESSURE RANGE OF 0 TO 150 PSI.

29. PIPE CUSHION SHALL BE OF HIGH RESISTIVITY MATERIAL. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT CUSHION MATERIAL HAS A RESISTIVITY GREATER THAN 5,000 OHM-CM. REMAINDER OF THE BACKFILL MATERIAL SHALL BE AS SPECIFIED IN THE WATER SYSTEM STANDARDS. PIPE CUSHION AND BACKFILL MATERIAL SHALL CONTAIN NO HAZARDOUS SUBSTANCES ABOVE REGULATORY ACTION LEVELS INCLUDING BUT NOT LIMITED TO LEAD, ASBESTOS, MERCURY, CHROMIUM, CADMIUM, ZINC, STRONTIUM, AND POLYCHLORINATED BIPHENYLS (PCB).

30. ALL SECTIONS OF THE WATER MAIN REQUIRING REINFORCED CONCRETE ENCASING SHALL BE DUCTILE IRON PIPE WITH DUCTILE IRON FITTINGS OR CONCRETE CYLINDER PIPE WITH CONCRETE CYLINDER FITTINGS.

31. CLEANING SHALL BE BY THE USE OF "PIGS" INTRODUCED INTO THE PIPELINE AND RUN COMPLETELY THROUGH ALL INSTALLED PIPELINES AND ALL BRANCH LINES FOR FIRE HYDRANTS. "PIGGING" OF SERVICE LATERALS IS NOT REQUIRED. RAPE FOAM "PIGS" SHALL BE USED TO SWAB PIPING CLEAN AS EACH LENGTH OF THE PIPELINE IS INSTALLED. EACH "PIG" SHALL CONSIST OF A CYLINDRICAL PIECE OF POLYURETHANE FOAM WITH A DENSITY OF 3-7 POUNDS PER CUBIC FOOT AND A VINYL-COATED NOSE. OUTSIDE DIAMETER OF THE "PIG" SHALL BE EQUAL TO 1-3/4 TO 1-1/2 TIMES THE INSIDE DIAMETER OF THE PIPE BEING INSTALLED. THE LENGTH OF THE "PIG" SHALL BE 1-1/2 TO 2 TIMES ITS DIAMETER. PRIOR TO USE, THE "PIG" SHALL BE SUBMERGED IN A CHLORINE SOLUTION OF 1 OZ. OF 5% CHLORINE BLEACH IN 5 GALLONS OF WATER. "PIGGING" OF THE PIPELINE SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE NEW PIPELINE.

WATER NOTES (CONTINUED):

32. TRAFFIC CONTROL PLAN: THE CONTRACTOR SHALL BECOME FAMILIAR WITH AND SHALL MEET THE LATEST REQUIREMENTS OF THE CITY DEPARTMENT OF TRANSPORTATION SERVICES (DTS). AFTER THE AWARD OF THE CONSTRUCTION CONTRACT, THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY DEPARTMENT OF PLANNING AND PERMITTING TRAFFIC REVIEW BRANCH FOR REVIEW AND APPROVAL BEFORE APPLYING FOR A STREET USAGE PERMIT. THE TRAFFIC CONTROL PLAN SHALL MEET ALL DTS REQUIREMENTS INCLUDING PREPARATION BY, OR UNDER THE SUPERVISION OF, A LICENSED PROFESSIONAL ENGINEER. PAYMENT FOR THE PREPARATION AND IMPLEMENTATION OF THE APPROVED TRAFFIC CONTROL PLAN SHALL NOT BE MADE DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL.

33. THE CONTRACTOR SHALL COORDINATE THE SECURING OF THE EXISTING WATER SYSTEM WITH THE EWS PRIOR TO EXCAVATING BEHIND OR REMOVING ANY EXISTING THRUST BLOCKS, STRUCTURAL STRUTS OR REACTION BEAMS, OR ANY FITTINGS SUCH AS TEES, PLUGS, CAPS, BENDS, REDUCERS, AND VALVES, OR ANY OTHER PIPELINE APPURTENANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED DAMAGES RESULTING FROM FAILURE TO ADEQUATELY SECURE THE EXISTING SYSTEM.

34. PIPE ALTERNATIVES:

A. DUCTILE IRON PIPES SHALL BE CLASS 52, DOUBLE WRAPPED WITH POLYETHYLENE.

B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150.* ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK. ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.

* FOR DIAMETERS 12" AND SMALLER: AWWA C900, CLASS 150 OR 200
FOR DIAMETERS 16" THROUGH 24": AWWA C905, DR18
FOR DIAMETERS 30" THROUGH 36": AWWA C905, DR21

CONSTRUCTION NOTES FOR GAS FACILITIES:

1. THE GAS COMPANY GAS PIPELINES IN THE PROJECT AREA ARE PLASTIC COATED AND CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR THESE GAS PIPELINES.

2. WRITTEN CLEARANCE MUST BE OBTAINED FROM THE GAS COMPANY, MAPS AND RECORDS DEPARTMENT, 515 KAMAKEE STREET, AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING EXCAVATION NEAR THESE GAS PIPELINES.

3. SINCE GAS LINE LOCATIONS ON FIELD MAPS ARE APPROXIMATE, THE CONTRACTOR, AFTER OBTAINING WRITTEN CLEARANCE, SHALL CALL USA NORTH A MINIMUM OF TWO (2) WORKING DAYS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF THE EXISTING GAS PIPELINES. THE TELEPHONE NUMBER IS 1-800-227-2600.

4. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPELINES IN THE PRESENCE OF A REPRESENTATIVE OF THE GAS COMPANY. ALL BACKFILL WITHIN SIX INCHES OF ANY GAS PIPELINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY THE GAS COMPANY.

5. FOR RELOCATION OF ANY GAS PIPELINE, THE CONTRACTOR SHALL NOTIFY THE GAS COMPANY FIVE (5) WORKING DAYS BEFORE STARTING WORK. THE TELEPHONE NUMBER IS 594-5574. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, OBTAIN TRAFFIC PERMITS, AND RESTORE PAVEMENT, SIDEWALKS, AND OTHER FACILITIES. ANY RELOCATION OF GAS FACILITIES SHALL BE DONE BY THE GAS COMPANY AND PAID FOR BY THE CONTRACTOR.

6. THE CONTRACTOR SHALL NOTIFY THE GAS COMPANY IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPELINES, COATINGS, OR ITS CATHODIC PROTECTION DEVICES. THE TELEPHONE NUMBER IS 836-5933, 24 HOURS A DAY. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO THE GAS COMPANY FACILITIES. REPAIR WORK ON SUCH DAMAGE SHALL BE DONE BY THE GAS COMPANY WITH PAYMENT FOR HIS WORK BE BORNE BY THE CONTRACTOR.

7. MINIMUM VERTICAL AND HORIZONTAL CLEARANCE BETWEEN THE GAS PIPELINES AND OTHER PIPELINES, CONDUITS, STRUCTURES, OR OTHER FACILITIES SHALL BE 12 INCHES. ADEQUATE SUPPORT AND PROTECTION FOR GAS PIPELINES EXPOSED IN THE TRENCH SHALL BE PROVIDED BY THE CONTRACTOR AND APPROVED BY THE GAS COMPANY.

8. THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER KEEP THE UNCOVERED GAS PIPELINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.

VERIZON HAWAII GENERAL CONSTRUCTION/DESIGN NOTES:

1. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.

2. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT AND TOWING REQUEST FROM VERIZON HAWAII'S EXCAVATION PERMIT SECTION, LOCATED AT 3228 WALEMA STREET, THIRD FLOOR, TWO WEEKS PRIOR TO THE START OF CONSTRUCTION. HOURS OF BUSINESS ARE 7:00 AM TO 10:45 AM AND 11:30 AM TO 2:45 PM MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS.

3. PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST VERIZON HAWAII TO LOCATE EXISTING DUCTLINE WHENEVER REQUIRED FOR UNDERGROUND CABLE LOCATING AND MARKING. FIVE (5) WORKING DAYS ADVANCE NOTICE IS REQUIRED. THREE (3) WORKING DAYS ADVANCE IS REQUIRED FOR ANY INSPECTION BY A DESIGNATED REPRESENTATIVE.

4. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION AND SHALL MAINTAIN PROPER CLEARANCES WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF VERIZON HAWAII FACILITIES. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS AND SHALL BE LIABLE FOR ANY DAMAGES TO VERIZON HAWAII FACILITIES. ANY DAMAGES SHALL BE REPORTED IMMEDIATELY TO VERIZON HAWAII'S REPAIR SECTION AT 811 (24 HOURS) OR TO THE EXCAVATION PERMIT SECTION AT 840-1464 (NORMAL WORKING HOURS, MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS). AS A RESULT OF HIS OPERATIONS, ADJUSTMENTS TO THE NEW DUCTLINE ALIGNMENT, IF REQUIRED, SHALL BE MADE TO PROVIDE THE REQUIRED CLEARANCES.

5. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. A VERIZON HAWAII INSPECTOR OR DESIGNATED REPRESENTATIVE IS REQUIRED TO BE AT ANY JOB SITE WHENEVER THERE WILL BE A BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAIN VERIZON HAWAII FACILITIES. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHENEVER NECESSARY.

6. THE CONTRACTOR SHALL NOTIFY VERIZON HAWAII'S INSPECTOR OR DESIGNATED REPRESENTATIVE A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION, BRACING OR BACKFILLING OF VERIZON HAWAII'S STRUCTURES OR FACILITIES.

7. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "VERIZON HAWAII STANDARD SPECIFICATIONS FOR PLACING UNDERGROUND TELEPHONE SYSTEMS" DATED MARCH 1999. ALL SUBSEQUENT AMENDMENTS AND ADDENDA, AND ALL OTHER PERTINENT STANDARDS FOR TELEPHONE CONSTRUCTION. CONTRACTOR SHALL FAMILIARIZE HIS PERSONNEL BY OBTAINING APPLICABLE SPECIFICATIONS.

8. WHEN EXCAVATION IS ADJACENT TO OR BENEATH VERIZON HAWAII'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL:

   a) SHEET AND/OR BRACE THE EXCAVATION TO PREVENT SLIDES, CAVE-INS, OR SETTLEMENTS TO ENSURE NO MOVEMENT TO VERIZON HAWAII'S STRUCTURES OR FACILITIES.

   b) PROTECT EXISTING STRUCTURES AND/OR FACILITIES WITH BEAMS, STRUTS, OR UNDERPINNING WHILE EXCAVATING BENEATH THEM TO ENSURE NO MOVEMENT TO VERIZON HAWAII'S STRUCTURES OR FACILITY.

9. THE CONTRACTOR SHALL BRACE ALL POLES OR LIGHT STANDARDS NEAR THE NEW DUCTLINE, MANHOLE, OR HANDHOLE DURING HIS OPERATIONS.

10. THE CONTRACTOR SHALL SAW-CUT A.C. PAVEMENT AND CONCRETE GUTTER WHENEVER NEW MANHOLES, HANDHOLES, OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.

11. THE CONTRACTOR SHALL COMPLY WITH THE POLICY ADOPTED BY THE DEPARTMENT OF DESIGN AND CONSTRUCTION, CITY AND COUNTY OF HONOLULU, CONCERNING THE REPLACEMENT OF CONCRETE SIDEWALKS AFTER EXCAVATION WORK.

12. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHENEVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

13. WHENEVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATIONS AND DEPTHS.

14. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE COST FOR SUPPLEMENTARY MEASURES, WHICH WILL BE REQUIRED BY THE CITY AND COUNTY, SHALL BE BORNE BY THE CONTRACTOR.

15. THE CONTRACTOR SHALL PUMP ALL MANHOLES DRY DURING FINAL INSPECTION.

16. THE CONTRACTOR SHALL NOTIFY VERIZON HAWAII INSPECTOR 24 HOURS PRIOR TO THE POURING OF CONCRETE OR BACKFILLING.

17. WHEN CONNECTING TO MANHOLE WALLS, ALL EXISTING REINFORCING BARS SHALL BE LEFT INTACT. DUCTS SHALL BE ADJUSTED IN THE FIELD IN ORDER TO CLEAR REINFORCING.

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY:

1. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK UPON STATE HIGHWAYS FROM THE OAHU DISTRICT ENGINEER, STATE HIGHWAYS, AT 727 KAKOI STREET, PRIOR TO COMMENCEMENT OF WORK WITHIN STATE'S HIGHWAY RIGHT-OF-WAY.

2. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT HIS CONSTRUCTION PLANS FOR DIVISION'S REVIEW AND REAPPROVAL.

PUBLIC TRANSIT DIVISION NOTE:

1. THE CONTRACTOR SHALL NOTIFY OAHU TRANSIT SERVICES, INC. (OTS), ED SNIFFEN AT 848-4571, OR LOWELL TOM AT 848-4578, TWO WEEKS PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL INFORM OTS OF THE LOCATION AND SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUS STOP.

02-031A

LESTER H. FUKUDA
LICENSED PROFESSIONAL ENGINEER
No. 6988-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES

APPROVED: Howard S. Takaba — DATE: 9/5/02
ENGINEER, MAINTENANCE UNIT, EWS

DRAWN BY: TM	ENGINEER: MTH	CHECKED BY: LHF	FILE NO.
FIELD BOOK NO.	SCALE: AS NOTED		SHEET 2 OF 31 SHEETS

CONSTRUCTION NOTES:

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986 AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984 AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
2. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
3. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES AND AGENCIES AND OBTAIN EXCAVATION CLEARANCE FOR ANY EXCAVATION WORK A MINIMUM OF 72 HOURS PRIOR TO START OF ANY EXCAVATION WORK AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
4. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
5. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54, "WATER QUALITY STANDARDS" AND CHAPTER 11-55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION
7. RE-APPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.
8. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS RESEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW FACILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
9. ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION AND ANY DAMAGE TO THEM SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.
10. WHEN TRENCH EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS OR UNDERPINNING TO FULLY PROTECT THEM FROM DAMAGE.
11. BACKFILL UNDER EXISTING STRUCTURES OR FACILITIES SHALL BE SANDY AND GRANULAR MATERIAL COMPLETELY PLACED AS SOON AS THE PIPE IS LAID AND TESTED. THE BACKFILL MATERIAL SHALL BE RAMMED WITH PROPER TOOLS UNTIL COMPACTED TO 90 - 95% OF ITS MAXIMUM DENSITY.
12. ALL ABANDONED PIPE OPENINGS SHALL BE PLUGGED WITH CLASS DW5 2000 CONCRETE TO A DEPTH OF ONE AND ONE-HALF TIMES THE PIPE DIAMETER.
13. ALL WORK CALLED FOR ON THE PLANS AND NOT ITEMIZED IN THE PROPOSAL AND ALL WORK NOT CALLED FOR BUT REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE CONSIDERED INCIDENTAL TO UNCLASSIFIED TRENCH EXCAVATION
14. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION, INCLUDING PAVEMENTS, PAVEMENT MARKERS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL. DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL AND INCLUDED WITHIN THE AMOUNT PAID FOR UNCLASSIFIED TRENCH EXCAVATION
15. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS IN DISPOSING OF WATER FROM THE WATER MAIN FOLLOWING TESTING, DISINFECTION, ETC.
16. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 42 "VEHICULAR NOISE CONTROL FOR OAHU", ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, STATE OF HAWAII, IN WHICH ALLOWABLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION ACTIVITIES FOR THIS PROJECT WILL EXCEED THE ALLOWABLE NOISE LEVELS, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A PERMIT FROM THE DIRECTOR OF THE DEPARTMENT OF HEALTH. THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 42 & 43 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR CONSTRUCTION ACTIVITIES
17. DURING NON-WORKING HOURS, THE TRENCHES SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC.
18. THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM DRIVEWAYS AND PUBLIC STREETS AT ALL TIMES.
19. NO STOCKPILING OF MATERIAL WILL BE PERMITTED ON PUBLIC RIGHT OF WAYS.
20. FOR BENCH MARK, SEE SHEET 5.
21. THE BOARD OF WATER SUPPLY SHALL REMAIN RESPONSIBLE FOR THE MAINTENANCE, REPAIR, REMOVAL, AND ANY ASSOCIATED COSTS OF THE ABANDONED UTILITY LINES, SERVICE LATERALS, UTILITY BOXES, MANHOLES, VALVES, ETC., SHOWN ON THIS CONSTRUCTION PLAN "JOB - LAIKU STREET WATER SYSTEM IMPROVEMENTS". ALL CLAIMS RESULTING FROM THE ABANDONED UTILITIES SHALL REMAIN THE LIABILITY OF THE BOARD OF WATER SUPPLY.
22. WHENEVER THE CENTER OF A STREET SURVEY MONUMENT IS LESS THAN THREE (3) FEET AWAY FROM THE EDGE OF THE ROADWAY, THE CONTRACTOR SHALL RETAIN A LICENSED LAND SURVEYOR TO REFERENCE THE LOCATION OF SAID STREET MONUMENT. ALL REFERENCING WORK SHALL BE SUBMITTED TO THE DEPARTMENT DESIGN AND CONSTRUCTION, DIVISION OF LAND SURVEY AND ACQUISITION, FOR REVIEW AND APPROVAL BEFORE COMMENCEMENT OF CONSTRUCTION ADJACENT TO STREET MONUMENTS.
23. STREET MONUMENTS THAT ARE DISTURBED SHALL BE RESTORED UNDER THE LICENSED LAND SURVEYOR'S DIRECTION. ANY NEW DATA SUCH AS ELEVATIONS SHALL BE CERTIFIED BY THE SURVEYOR AND SUBMITTED TO THE DEPARTMENT OF PLANNING AND PERMITTING
24. THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, D.P.P., AT 523-4881 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

SEWER NOTES:

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, SEPT. 1986, THE DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS, SEPT. 1984, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990 AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT, VOL 1, JULY 1992.
2. THE CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION, WASTEWATER BRANCH, DOE, AT 527-5242 OR 523-4345 TO ARRANGE FOR INSPECTION SERVICES AND SUBMIT FOUR (4) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF SEWER WORK. THE CONTRACTOR SHALL PAY FOR ALL INSPECTION COSTS.
3. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS RESEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES, INCLUDING AND AFFECTING SEWER LINES, IN THE PRESENCE OF THE WASTEWATER INSPECTOR AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC NOTIFICATIONS AND PRESS RELEASES.
6. SEE "ADJUSTMENT TO EXISTING UTILITIES NOTE", THIS SHEET.
7. FOR SEWER MANHOLE ADJUSTMENTS UPWARD LESS THAN 3", SEE STD. DETAIL S-7.2. FOR SAME ADJUSTMENTS UPWARD GREATER THAN 3" OR FOR ANY ADJUSTMENTS DOWNWARD, RECONSTRUCT SUCH TOP FROM BELOW THE CONE SECTION.
8. CONFINED SPACE

   FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING

   1. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
      a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
      b. LIFELINE AND ASSOCIATED CLIPS.
      c. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
      d. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
      e. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
      f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
      g. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
      h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.S
   2. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROMOTE SAFE ENTRY CONDITIONS.
   3. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
9. SEWERS SHALL BE LAID AT LEAST 8 FEET, HORIZONTALLY, FROM ANY EXISTING OR PROPOSED WATER MAIN. WHEN CONDITIONS PREVENT A LATERAL SEPARATION OF 8 FEET, A SEWER MAY BE LAID CLOSER THAN 8 FEET TO THE WATER MAIN UNDER THE FOLLOWING CONDITION: 1. IT IS LAID IN A SEPARATE TRENCH OR IT IS LAID IN THE SAME TRENCH WITH THE WATER MAIN LOCATED TO ONE SIDE ON A BENCH OF UNDISTURBED EARTH, 2. THE ELEVATION OF THE TOP (CROWN) OF THE SEWER IS AT LEAST 6 INCHES BELOW THE BOTTOM (INVERT) OF THE WATER MAIN, 3. OTHER ALTERNATIVES SUCH AS A CONCRETE JACKET SHALL BE CONSIDERED.
10. WATER LATERALS AND WATER METER BOXES SHOULD NOT BE PLACED OVER OR NEAR SEWER LATERALS. WATER VALVES, AIR RELEASE VALVES, BLOWS AND CONCRETE BLOCKS, FIRE HYDRANTS, ETC. SHOULD NOT BE PLACED OVER OR NEAR SEWER LINES AND LATERALS.
11. WHENEVER A SEWER LINE VERTICALLY CROSSES WATER MAINS, THE SEWER LINE MUST BE JACKETED WITH REINFORCED CONCRETE FOR A MINIMUM OF 5 FEET ON BOTH SIDES OF THE POINT OF CROSSING IF THE SEWER IS ABOVE THE WATER MAIN AND FOR 3 FEET ON BOTH SIDES IF THE SEWER IS BELOW THE WATER MAIN. HOWEVER, JACKETING MAY BE ELIMINATED IF THE SEWER LINE IS BELOW THE WATER MAIN AND THE SEPARATION OF BOTH PIPES IS 18 INCHES AND ADEQUATE STRUCTURAL REQUIREMENTS ARE MET. SEE STD. DET. S-6 FOR THE DETAIL OF THE REINFORCED CONCRETE JACKET FOR PIPES 12 INCHES AND SMALLER. FOR PIPES GREATER THAN 12 INCHES IN DIAMETER, PROVIDE A NEW DETAIL OF THE REINF. CONCRETE JACKET.

ADJUSTMENT TO EXISTING UTILITIES NOTE:

1. ADJUST ALL UTILITY VALVE BOX FRAMES & COVERS, WATER METER BOXES, MANHOLE FRAMES & COVERS, STREET MONUMENT COVERS, ETC., TO NEW FINISH GRADE. COORDINATE WITH PRIVATE COMPANIES AND CITY AGENCIES FOR WORK ON EACH RESPECTIVE UTILITIES.

TRAFFIC NOTES FOR WORK IN CITY & COUNTY OF HONOLULU STREETS OR HIGHWAYS:

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN. CONSTRUCTION TRAFFIC CONTROL PLANS APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES AND/OR THE DEPARTMENT OF PLANNING AND PERMITTING MUST BE PROVIDED WHEN APPLYING FOR THE PERMIT.
2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
4. DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE FOR THROUGH TRAFFIC ON STREETS TOO NARROW TO MAKE THIS PRACTICABLE. THE CONTRACTOR MAY WORK ON ONE-HALF OF THE ROADWAY, KEEPING THE OTHER HALF OPEN TO TRAFFIC AND ALTERNATING THE FLOW OF TRAFFIC DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL AND ALL LANES SHALL BE OPEN TO TRAFFIC
5. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
6. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
7. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WORKING AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED. ALL PASSAGEWAYS SO PROVIDED SHALL BE HANDICAP ACCESSIBLE AND CONFORM TO THE THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES.
8. THE CONTRACTOR SHALL REFERENCE, TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES AND THE DEPARTMENT OF PLANNING AND PERMITTING, ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT 523-4029 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POSTS, AND PAVEMENT MARKINGS.
9. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN STREET RIGHT-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY DEPARTMENTS OF TRANSPORTATION SERVICES
10. BOARD OF WATER SUPPLY SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THIS NOTICE AND THE HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE #2.
11. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PLANNING AND PERMITTING AT 523-4881 ONE (1) WEEK PRIOR TO ANY WORK DONE ON SIGNS, POSTS AND PAVEMENT MARKINGS.

TRAFFIC SIGNALS AND TECHNOLOGY DIVISION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE: 523-4580).
2. THE TRAFFIC SIGNAL SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION REQUIRED SHALL BE APPROVED BY THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, AND PAID FOR BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE EXISTING TRAFFIC SIGNAL FACILITIES, INCLUDING BUT NOT LIMITED TO THE TRAFFIC SIGNAL FIBER OPTIC CABLE SYSTEM, AND INTERCONNECT SYSTEM. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION.

MECHANICAL/ELECTRICAL DESIGN AND ENGINEERING DIVISION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.
2. THE CONTRACTOR SHALL NOTIFY THE MECHANICAL/ELECTRICAL DESIGN AND ENGINEERING DIVISION, DEPARTMENT OF DESIGN AND CONSTRUCTION, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE STREET LIGHTING SYSTEM (PHONE: 527-5002).
3. THE STREET LIGHTING SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION REQUIRED SHALL BE APPROVED BY THE MECHANICAL/ELECTRICAL DESIGN AND ENGINEERING DIVISION, DEPARTMENT OF DESIGN AND CONSTRUCTION, AND PAID FOR BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE EXISTING STREET LIGHTING FACILITIES. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE CITY'S EXISTING COMMUNICATIONS FIBER OPTIC CABLE SYSTEM. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES:

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. CITY THE MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF THE PUBLIC. THE CONTRACTOR SHALL APPLY FOR A CONSTRUCTION PERMIT WITH A NOISE POLLUTION CONTROL PLAN.

HAWAIIAN ELECTRIC COMPANY NOTES:

1. LOCATION OF HECO FACILITIES

   THE LOCATION OF HECO'S OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS HAVING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATIONS OF THE FACILITIES AND SHALL EXERCISE PROPER CARE IN EXCAVATING AND WORKING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES AND UTILITY CROSSINGS ARE SHOWN, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS AND CROSSING TO VERIFY THE DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HECO'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.
2. COMPLIANCE WITH HAWAII OCCUPATIONAL SAFETY AND HEALTH LAWS

   THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, THOSE RELATED TO WORKING ON OR NEAR EXPOSED OR ENERGIZED ELECTRICAL LINES AND EQUIPMENT.
3. EXCAVATION PERMIT

   THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HECO'S TECHNICAL DIVISION (543-5654) LOCATED AT 820 WARD AVENUE, 4TH FLOOR, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. PLEASE REFER TO OUR REQUEST NUMBER AT THAT TIME.
4. CAUTION!!! ELECTRICAL HAZARDS!!

   EXISTING HECO OVERHEAD AND UNDERGROUND LINES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION UNLESS PRIOR SPECIAL ARRANGEMENTS HAVE BEEN MADE WITH HECO. ONLY HECO PERSONNEL ARE TO HANDLE THESE ENERGIZED LINES AND ERECT TEMPORARY GUARDS TO PROTECT THESE LINES FROM DAMAGE. THE CONTRACTOR SHALL WORK CAUTIOUSLY AT ALL TIMES TO AVOID ACCIDENTS AND DAMAGE TO EXISTING HECO FACILITIES, WHICH CAN RESULT IN ELECTROCUTION.
5. OVERHEAD LINES

   STATE LAW REQUIRES THAT A WORKER AND THE LONGEST OBJECT HE OR SHE MAY CONTACT CANNOT COME CLOSER THAN A MINIMUM RADIAL CLEARANCE OF 10 FEET WHEN WORKING CLOSE TO OR UNDER ANY OVERHEAD LINES RATED 50KV AND BELOW. FOR EACH ADDITIONAL 1KV ABOVE 50KV, AN ADDITIONAL 0.4 INCH SHALL BE ADDED TO THE 10-FOOT CLEARANCE REQUIREMENT. THE PRECISE INFORMATION ON LINE CLEARANCE REQUIREMENTS IS PROVIDED AS A CONVENIENCE AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE INFORMED OF AND COMPLY WITH ANY REVISIONS OR AMENDMENTS TO THE LAW.

   SHOULD THE CONTRACTOR ANTICIPATE THAT HIS WORK WILL RESULT IN THE NEED TO ENCROACH WITHIN THE MINIMUM REQUIRED CLEARANCE AT ANY TIME, THE CONTRACTOR SHALL NOTIFY HECO AT LEAST FOUR (4) WEEKS PRIOR TO THE PLANNED ENCROACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE, DE-ENERGIZE OR BLANKET HECO LINES) CAN BE PUT IN PLACE. HECO'S COST OF SAFEGUARDING ITS LINES WILL BE CHARGED TO THE CONTRACTOR.

   CONTACT HECO'S CUSTOMER INSTALLATIONS DEPARTMENT AT 543-7866 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

   REFER TO SECTION K OF HECO'S ELECTRIC SERVICE INSTALLATION MANUAL FOR ADDITIONAL GUIDELINES WHEN WORKING AROUND HECO'S FACILITIES. A COPY MAY BE OBTAINED FROM HECO'S CUSTOMER INSTALLATIONS DEPARTMENT.
6. POLE BRACING

   A MINIMUM CLEARANCE OF 10 FEET MUST BE MAINTAINED WHEN EXCAVATING AROUND UTILITY POLES AND/OR THEIR ANCHOR SYSTEM TO PREVENT WEAKENING OR POLE SUPPORT FAILURE. SHOULD WORK REQUIRE EXCAVATING WITHIN 10 FEET OF A POLE AND/OR ITS ANCHOR SYSTEM, THE CONTRACTOR SHALL PROTECT, SUPPORT, SECURE, AND TAKE ALL OTHER PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF THESE POLES. THE CONTRACTOR IS RESPONSIBLE FOR ALL ASSOCIATED COSTS TO BRACE, REPAIR, OR REINSTATE POLES. ALL MEANS OF STRUCTURAL SUPPORT FOR THE POLE PROPOSED BY THE CONTRACTOR SHALL FIRST BE REVIEWED BY HECO BEFORE IMPLEMENTATION. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HECO CONSTRUCTION AND MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT AT 543-4223 A MINIMUM OF TWO (2) WEEKS IN ADVANCE.

HAWAIIAN ELECTRIC COMPANY NOTES (CONTINUATION):

2. UNDERGROUND LINES

   THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES. HECO'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HECO PERSONNEL ARE TO BREAK INTO EXISTING HECO FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HECO'S ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF ITS UNDERGROUND LINES WILL BE CHARGED TO THE CONTRACTOR. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HECO'S 138KV UNDERGROUND LINES (SEE HECO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HECO'S UNDERGROUND 138KV LINES" FOR DETAILED REQUIREMENTS).

   FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL HECO'S UNDERGROUND DIVISION AT 543-7049 A MINIMUM OF 72 HOURS IN ADVANCE.

   FOR ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE LINES, THE CONTRACTOR SHALL CALL HECO'S CONSTRUCTION & MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT, AT 543-4223, A MINIMUM OF TWO (2) WEEKS IN ADVANCE.
3. UNDERGROUND FUEL LINES

   THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HECO'S UNDERGROUND FUEL OIL PIPELINES. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HECO'S UNDERGROUND FUEL OIL PIPELINES (SEE HECO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HECO'S UNDERGROUND FUEL PIPELINES" FOR DETAILED REQUIREMENTS).
4. EXCAVATIONS

   WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HECO'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR:

   a) SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE AND TO PREVENT POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENTS.

   b) PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNINGS TO FULLY PROTECT IT FROM DAMAGE.

   c) BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DEPARTMENT FOR THERMAL BACKFILL SPECIFICATIONS).
5. RELOCATION OF HECO FACILITIES

   ANY WORK REQUIRED TO RELOCATE OR MODIFY HECO FACILITIES SHALL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION. THE CONTRACT

WATER SERVICE TABLE
WAIOLU STREET

NO.	TMK NO.	METER NO.	PREM. ID. NO.	EXIST LAT TYPE BOX	METER SIZE	NEW LATERAL
1	8-7-042:103	94040179	1151847	C, X	1"	3
2	8-7-042:103	95189626	1151847	8" DI.	6"	5
3	8-7-042:045	95022901	1151848	B, X	5/8"	1
4	8-7-042:094	95020422	1151849	B, X	5/8"	1
5	8-7-042:046	95022904	1151850	C-1, X	5/8"	2
6	8-7-042:047	95022912	1151851	C-1, X	5/8"	2

WATER SERVICE TABLE
LAIKU STREET

NO.	TMK NO.	METER NO.	PREM. ID. NO.	EXIST LAT TYPE BOX	METER SIZE	NEW LATERAL
7	8-7-042:093	95020029	1091719	B, X	5/8"	1
8	8-7-042:092	95022662	1091720	C-1, X	5/8"	2
9	8-7-042:091	95022666	1091721	C-1, X	5/8"	2
10	8-7-042:090	95022663	1091723	D-2, X	5/8"	4
11	8-7-042:089	95022661	1091724	D-2, X	5/8"	4
12	8-7-042:088	95022669	1091726	D-2, X	5/8"	4
13	8-7-042:151	95022719	1091722	B, X	5/8"	2
14	8-7-042:150	95022717	1091725	B, X	5/8"	2
15	8-7-042:087	95022665	1091727	B, X	5/8"	1
16	8-7-042:149	95022718	1091728	C-1, X	5/8"	2
17	8-7-042:148	94021317	1091732	C-1, X	5/8"	2
18	8-7-042:086	94021426	1091729	B, X	5/8"	2
19	8-7-042:085	94021428	1091730	B, X	5/8"	2
20	8-7-042:084	94021427	1091731	B, X	5/8"	2
21	8-7-042:083	94021366	1091733	B, X	5/8"	2
22	8-7-042:147	97023128	1091734	C-1, X	5/8"	2
23	8-7-042:146	94021315	1091737	C-1, X	5/8"	2
24	8-7-042:082	94021369	1091735	D-2, X	5/8"	4
25	8-7-042:081	94021383	1091736	D-2, X	5/8"	4
26	8-7-042:080	94021365	1091738	D-2, X	5/8"	4
27	8-7-042:145	94021314	1091740	B, X	5/8"	1
28	8-7-042:079	94020617	1091739	B, X	5/8"	1
29	8-7-042:144	94021313	1091741	B, X	5/8"	1
30	8-7-042:143	94021312	1091742	C-1, X	5/8"	2
31	8-7-042:142	94021311	1091743	C-1, X	5/8"	2
32	8-7-042:075	94021367	1136560	C-1, X	5/8"	2
33	8-7-042:074	94020615	1091744	C-1, X	5/8"	2
34	8-7-042:141	94021430	1091748	C-1, X	5/8"	2
35	8-7-042:140	94021425	1091749	C-1, X	5/8"	2
36	8-7-042:073	94020618	1091745	D-2, X	5/8"	4
37	8-7-042:072	94021370	1091747	D-2, X	5/8"	4
38	8-7-042:071	94021382	1091748	D-2, X	5/8"	4
39	8-7-042:070	94021384	1091750	C-1, X	5/8"	2

WATER SERVICE TABLE
LAIKU STREET

NO.	TMK NO.	METER NO.	PREM. ID. NO.	EXIST LAT TYPE BOX	METER SIZE	NEW LATERAL
40	8-7-042:069	94020620	1091752	C-1, X	5/8"	2
41	8-7-042:139	94021429	1091751	C-1, X	5/8"	2
42	8-7-042:138	94021424	1091755	C-1, X	5/8"	2
43	8-7-042:068	94021368	1091753	C-1, X	5/8"	2
44	8-7-042:067	94021363	1091754	C-1, X	5/8"	2
45	8-7-043:082	94021361	1091757	D-2, X	5/8"	4
46	8-7-043:116	94021423	1091756	C-1, X	5/8"	2
47	8-7-043:115	95020030	1091759	C-1, X	5/8"	2
48	8-7-043:081	94020619	1091758	D-2, X	5/8"	4
49	8-7-043:080	94020611	1091760	D-2, X	5/8"	4
50	8-7-043:079	94020612	1091761	B, X	5/8"	1
51	8-7-043:078	94021388	1091763	B, X	5/8"	1
52	8-7-043:114	95022521	1091762	C-1, X	5/8"	2
53	8-7-043:113	95020024	1091765	C-1, X	5/8"	2
54	8-7-043:077	94020616	1091764	C-1, X	5/8"	2
55	8-7-043:076	94020614	1091766	C-1, X	5/8"	2
56	8-7-043:075	94021385	1091767	B, X	5/8"	1
57	8-7-043:112	95020021	1091769	C-1, X	5/8"	2
58	8-7-043:111	95022696	1091771	C-1, X	5/8"	2
59	8-7-043:074	95020025	1091768	C-1, X	5/8"	2
60	8-7-043:073	95020026	1091770	C-1, X	5/8"	2
61	8-7-043:072	95022670	1091772	C-1, X	5/8"	2
62	8-7-043:071	95020093	1091773	C-1, X	5/8"	2
63	8-7-043:110	95020028	1091774	C-1, X	5/8"	2
64	8-7-043:109	95022715	1091777	C-1, X	5/8"	2
65	8-7-043:070	95022526	1091775	B, X	5/8"	1
66	8-7-043:069	95020095	1091776	C-1, X	5/8"	2
67	8-7-043:068	95022667	1091778	C-1, X	5/8"	2
68	8-7-043:067	95022684	1091779	B, X	5/8"	1
69	8-7-043:108	95022720	1091781	B, X	5/8"	1
70	8-7-043:066	95020082	1091780	B, X	5/8"	1
71	8-7-043:107	95022711	1091782	C-1, X	5/8"	2
72	8-7-043:106	95022712	1091784	C-1, X	5/8"	2
73	8-7-043:037	95020011	1091783	C-1, X	5/8"	2
74	8-7-043:036	95020013	1091785	C-1, X	5/8"	2
75	8-7-043:035	98024722	1091786	C-1, X	5/8"	2
76	8-7-043:034	95022522	1114766	C-1, X	5/8"	2
77	8-7-043:023	95022694	1151894	C-1, X	5/8"	2
78	8-7-043:024	95022692	1091787	C-1, X	5/8"	2

WATER SERVICE TABLE
WAIOLU STREET

NO.	TMK NO.	METER NO.	PREM. ID. NO.	EXIST LAT TYPE BOX	METER SIZE	NEW LATERAL
79	8-7-043:087	95020045	1151885	C-1, X	5/8"	2
80	8-7-043:086	95020044	1151887	C-1, X	5/8"	2
81	8-7-043:012	95022550	1151886	C-1, X	5/8"	2
82	8-7-043:013	95022545	1151888	C-1, X	5/8"	2
83	8-7-043:089	95020043	1151889	B, X	5/8"	1
84	8-7-043:104	95020078	1151890	C-1, X	5/8"	2
85	8-7-043:105	95022716	1151893	C-1, X	5/8"	2
86	8-7-043:021	95022568	1151891	C-1, X	5/8"	2
87	8-7-043:022	95022569	1151892	C-1, X	5/8"	2

WATER SERVICE TABLE
PRINCESS KAHANU AVENUE

NO.	TMK NO.	METER NO.	PREM. ID. NO.	EXIST LAT TYPE BOX	METER SIZE	NEW LATERAL
88	8-7-033:014	93040131	1136551	C, X	1"	3
89	8-7-033:032	93022290	1136552	C-1, X	5/8"	2
90	8-7-033:031	93022288	1136553	C-1, X	5/8"	2
91	8-7-033:030	93022285	1136554	B, X	5/8"	1
92	8-7-033:029	93022282	1136555	C-1, X	5/8"	2
93	8-7-033:028	93022281	1136556	C-1, X	5/8"	2
94	8-7-042:076	94021364	1136558	B, X	5/8"	1
95	8-7-042:077	94021362	1136557	C-1, X	5/8"	2
96	8-7-042:078	94020613	1136559	C-1, X	5/8"	2

CONNECTION SCHEDULE

SHEET NO.	STREET NAME	CONNECTION STATION	NORMAL WORKING HOURS	AFTER WORKING HOURS	MAXIMUM DOWN TIME
6	INTERSECTION HAKIMO RD. AND WAIOLU ST.	STA. 0+00 W.L. "A" CUT AND PLUG EXIST. W12"	X		6 HOURS
6	WAIOLU ST.	STA. 2+58 W.L. "A" CUT AND PLUG EXIST. W8"	X		6 HOURS
7	PONAHAKEONE PL.	STA. 0+20 W.L. "AA" CUT AND PLUG EXIST. W8"	X		6 HOURS
7	INTERSECTION WAIOLU ST. AND LAIKU ST.	STA. 0+18 W.L. "AB" CUT AND PLUG EXIST. W8"	X		6 HOURS
7	LAIKU ST.	CONNECT PHASE 2 TO PHASE 1 STA. 6+50 W.L. "A"	X		6 HOURS
9	INTERSECTION PRINCESS KAHANU AVE. AND LAIKU ST.	CONNECT PHASE 2 TO PHASE 1 STA. 12+53.98 W.L. "A" OFFSET 10.89' RT. = STA. 5+00 W.L. "D"	X		6 HOURS
9	LAIKU ST.	CONNECT PHASE 3 TO PHASE 2 STA. 12+80 W.L. "A"	X		6 HOURS
10	LAIKU ST.	CONNECT PHASE 4 TO PHASE 3 STA. 19+90 W.L. "A"	X		6 HOURS
11	INTERSECTION LAIKU ST. AND LAIKU PL.	STA. 0+30 W.L. "AC" CUT AND PLUG EXIST. W8"	X		6 HOURS

CONNECTION SCHEDULE (CONTINUED)

SHEET NO.	STREET NAME	CONNECTION STATION	NORMAL WORKING HOURS	AFTER WORKING HOURS	MAXIMUM DOWN TIME
12	INTERSECTION LAIKU ST. AND WAIOLU ST.	CONNECT PHASE 5 TO PHASE 4 STA. 24+28.05 W.L. "A", OFFSET 10' LT. = STA. 4+43.86 W.L. "B"	X		6 HOURS
12	INTERSECTION LAIKU ST. AND WAIOLU PL.	STA. 0+25.27 W.L. "AD" CUT AND PLUG EXIST. W8"	X		6 HOURS
12	LAIKU ST.	STA. 28+17.68 W.L. "A" CUT AND PLUG EXIST. W8"	X		6 HOURS
13	INTERSECTION WAIOLU ST. AND MANAIAKALANI PL.	STA. (-)01+21.14 W.L. "B" CUT AND PLUG EXIST. W8"	X		6 HOURS
		STA. 0+25 W.L. "BA" CUT AND PLUG EXIST. W8"	X		6 HOURS
14	INTERSECTION WAIOLU ST. AND PUALELANI ST.	STA. 0+44 W.L. "BB" CUT AND PLUG EXIST. W8"	X		6 HOURS
		STA. (-)0+28.11 W.L. "BB" CUT AND PLUG EXIST. W8"	X		6 HOURS
15	PRINCESS KAHANU AVE.	STA. 0+00 W.L. "C" CUT AND PLUG EXIST. W8"	X		6 HOURS
		STA. 2+18.04 W.L. "C" CUT AND PLUG EXIST. W8"	X		6 HOURS
16	PRINCESS KAHANU AVE.	STA. 0+00 W.L. "D" CUT AND PLUG EXIST. W8"	X		6 HOURS

LEGEND:

1. 1" COPPER SERVICE LATERAL RECONNECTION
2. 1-1/2" COPPER SERVICE LATERAL RECONNECTION WITH TWO 1" CONNECTIONS
3. 1-1/2" COPPER SERVICE LATERAL RECONNECTION
4. 2" COPPER SERVICE LATERAL RECONNECTION WITH THREE 1-1/2" CONNECTIONS 1 - 8" BOSSED TEE
5. 8" PIPE RECONNECTION (D.C. METER)

NOTE:

EXISTING PLASTIC POLYBUTYLENE (PB) LATERALS ARE TO BE REPLACED WITH COPPER LATERALS. POLYBUTYLENE LATERALS ARE TO BE COMPLETELY DISCONNECTED FROM THE SYSTEM.

02-031A

LESTER W. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 4906-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

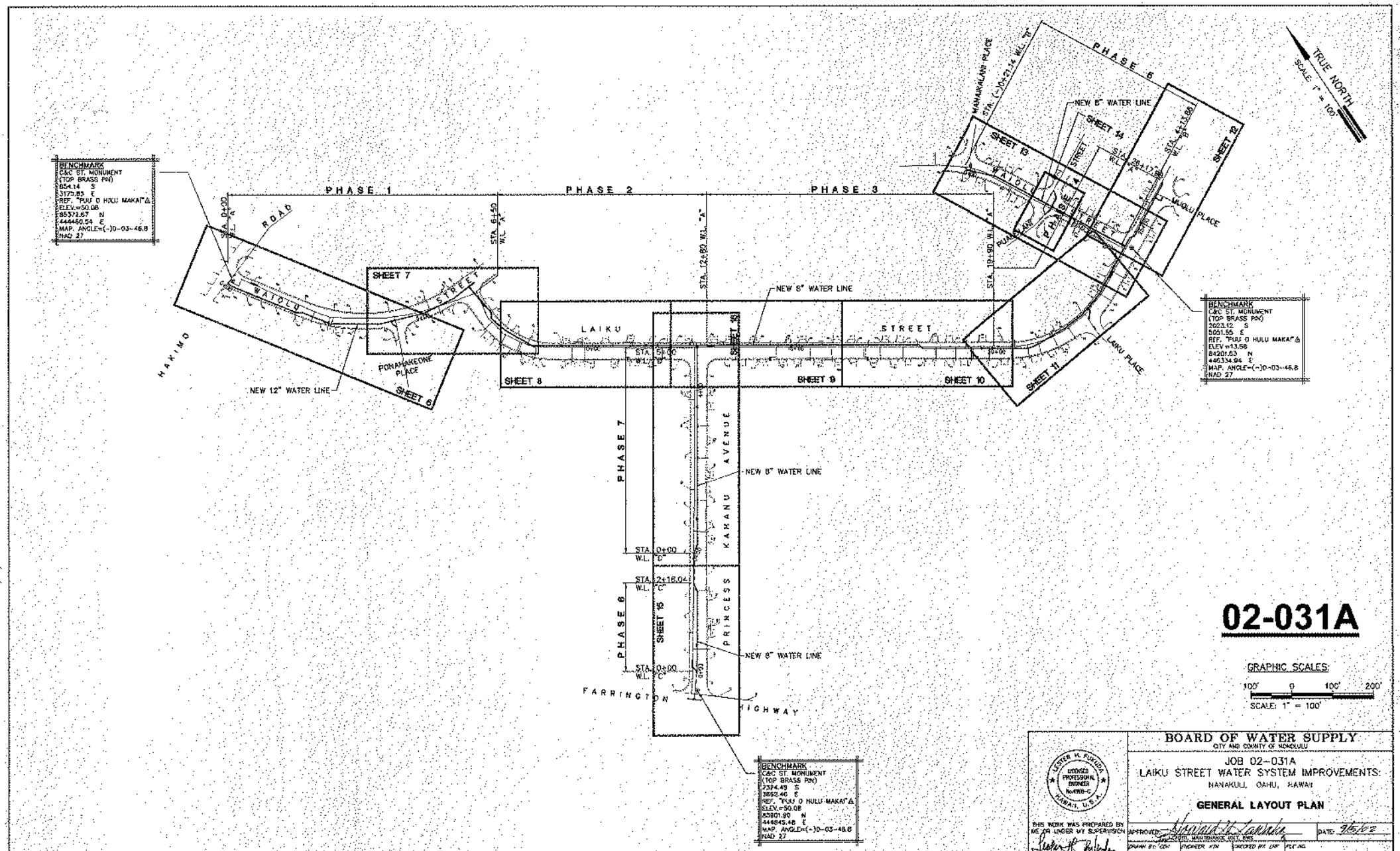
WATER SERVICE TABLE AND CONNECTION SCHEDULE

APPROVED: Howard K. Takahashi
SUPERVISOR, MAINTENANCE UNIT, EMS

DATE: 9/5/02

DRAWN BY: CEN | EXPANSION: N/A | CHECKED BY: LWF | FILE NO.

FIELD BOOK NO. | SCALE: | SHEET 4 OF 31 SHEETS



02-031A

GRAPHIC SCALES:

100' 0 100' 200'

SCALE: 1" = 100'

LICENSED PROFESSIONAL ENGINEER No. 9108-C LESTER M. FUKUDA HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

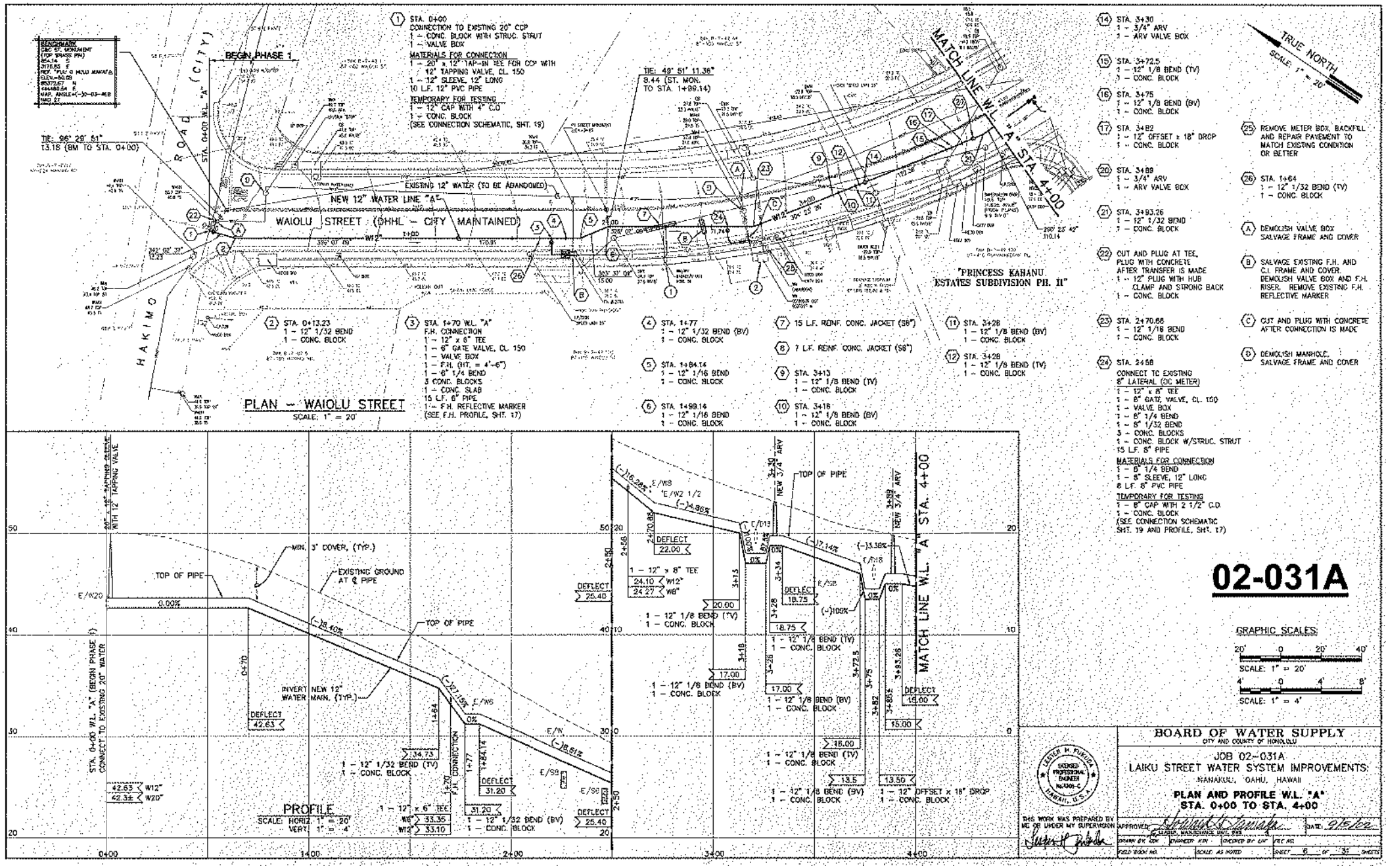
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

GENERAL LAYOUT PLAN

APPROVED: _____ DATE: 9/5/02
MANAGER AND CHIEF ENGINEER

DRAWN BY: CDO | TRACED BY: KIN | CHECKED BY: LMF | FILE NO.

FIELD BOOK NO. | SCALE: AS NOTED | SHEET 5 OF 31 SHEETS



02-031A

GRAPHIC SCALES:

20' 0 20' 40'
SCALE: 1" = 20'

4' 0 4' 8'
SCALE: 1" = 4'

LICENSED PROFESSIONAL ENGINEER No. 4309-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

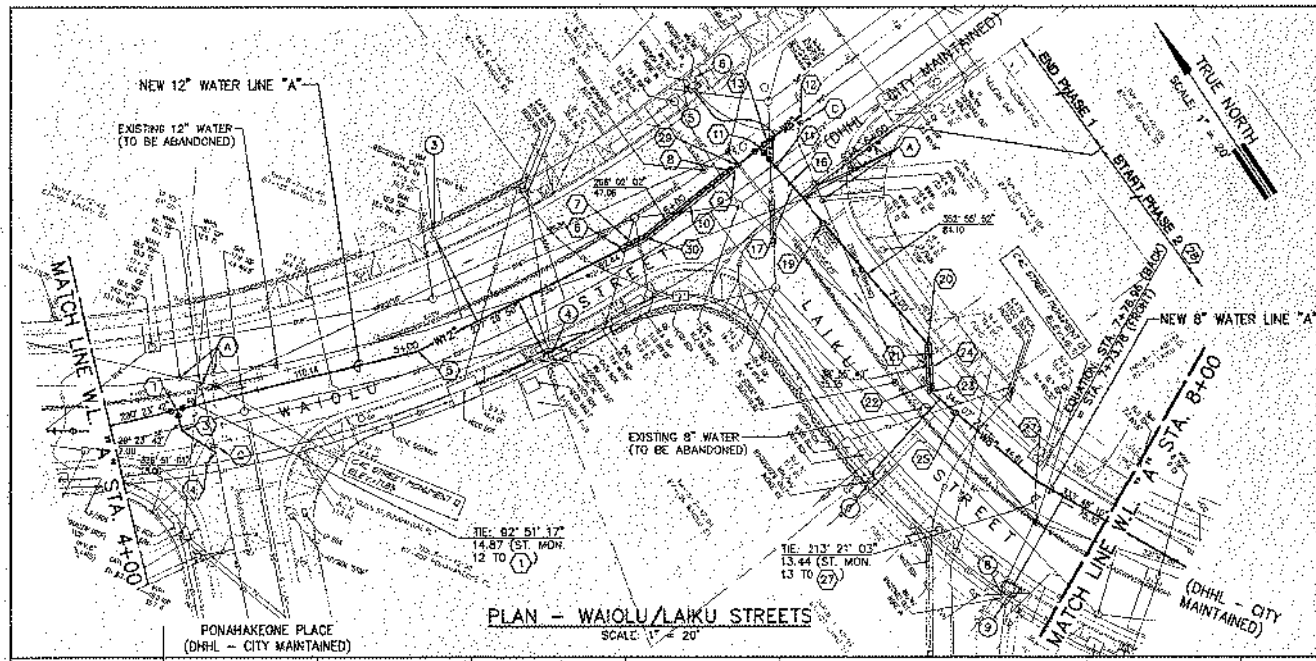
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
WAHIAWA, OAHU, HAWAII

PLAN AND PROFILE W.L. "A" STA. 0+00 TO STA. 4+00

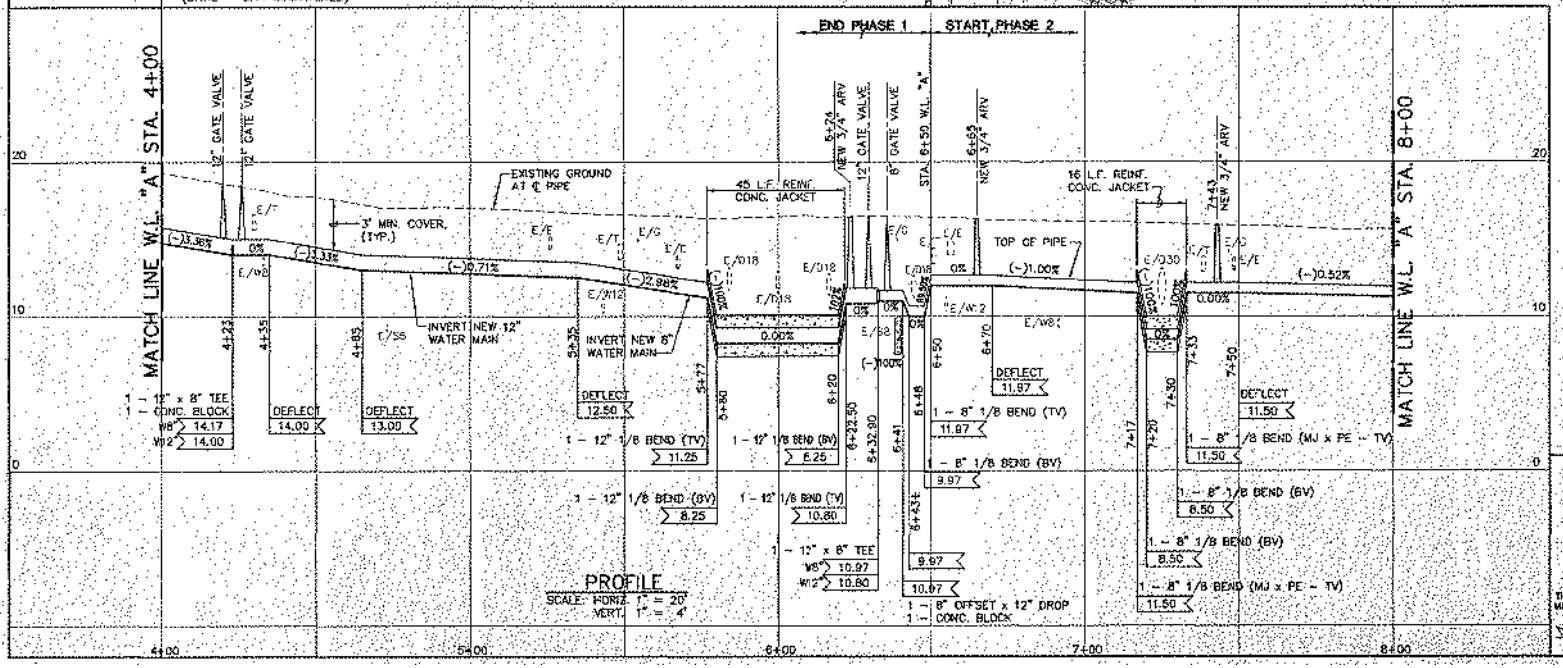
APPROVED: _____ DATE: 9/15/02
MANAGER, MAINTENANCE DIVISION

DRAWN BY: KDK | ENGINEER: KDN | CHECKED BY: GW | FILE NO.:

FIELD BOOK NO. | SCALE: AS NOTED | SHEET 6 OF 31 SHEETS



PLAN – WAIOLU/LAIKU STREETS
SCALE: 1" = 20'



PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

1 STA. 4+23 W.L. "A" = STA. 0+00 W.L. "AA"
1 – 12" x 8" TEE
2 – 12" GATE VALVES, CL. 150
1 – 8" GATE VALVE, CL. 150
3 – VALVE BOXES
1 – CONC. BLOCK
15 L.F. 8" PIPE (W.L. "AA")

3 STA. 0+07 W.L. "AA"
1 – 8" 1/8 BEND
1 – CONC. BLOCK

4 STA. 0+20 W.L. "AA"
CONNECTION TO 8" WATER ON PONAHAKEONE PLACE
1 – CONC. BLOCK WITH STRUC. STRUT
MATERIALS FOR CONNECTION
1 – 8" 1/8 BEND
2 – 8" SLEEVES, 12" LONG
6 L.F. 8" PIPE
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC, SHT. 19 AND PROFILE W.L. "AA", SHT. 17)

5 STA. 5+03.40
1 – 12" 1/32 BEND
1 – CONC. BLOCK

6 STA. 5+77
1 – 12" 1/8 BEND (TV)

7 STA. 5+80
1 – 12" 1/8 BEND (BV)

8 STA. 6+20
1 – 12" 1/8 BEND (BV)

9 STA. 6+22
1 – 12" 1/8 BEND (TV)

70 45 L.F. REINF. CONC. JACKET (W12")

11 STA. 6+32.90 W.L. "A" = STA. 0+00 W.L. "AB"
1 – 12" x 8" TEE
1 – 12" GATE VALVE, CL. 150
2 – 8" GATE VALVES, CL. 150
3 – VALVE BOXES
1 – 12" x 8" REDUCER (SEB)
1 – CONC. BLOCK
12 L.F. 8" PIPE (W.L. "AB")
(SEE PROFILE FOR W.L. "AB", SHT. 17)

12 STA. 0+18 W.L. "AB"
CONNECTION TO EXISTING 8" WATER
MATERIALS FOR CONNECTION
10 L.F. 8" PIPE
2 – 8" SLEEVES, 12" LONG
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC, SHT. 19 AND PROFILE W.L. "AB", SHT. 17)

13 17 L.F. REINF. CONC. JACKET (E/SS")

14 STA. 6+41
1 – 8" OFFSET x 12" DROP
1 – CONC. BLOCK

16 STA. 6+48
1 – 8" 1/8 BEND (BV)
1 – CONC. BLOCK

17 STA. 6+50
1 – 8" 1/8 BEND (TV)
1 – CONC. BLOCK

19 STA. 6+85
1 – 3/4" ARV
1 – ARV VALVE BOX

20 STA. 7+17
1 – 8" 1/8 BEND (MJ x PE – TV)
1 – 8" 1/8 BEND (HORIZ.)

21 STA. 7+20
1 – 8" 1/8 BEND (BV)

22 STA. 7+30
1 – 8" 1/8 BEND (BV)

23 STA. 7+32.35
1 – 8" 1/8 BEND (HORIZ.)
1 – 8" 1/8 BEND (MJ x PE – TV)

24 16 L.F. REINF. CONC. JACKET (W8")

25 STA. 7+43
1 – 3/4" ARV
1 – ARV VALVE BOX

27 STA. 7+76.96
1 – 8" 1/32 BEND
1 – CONC. BLOCK

28 STA. 6+50 (END PHASE 1)
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
STA. 8+54 (START PHASE 2)
REMOVE 8" CAP AND CONC. BLOCK AND CONNECT PHASE 2 TO PHASE 1
MATERIALS FOR CONNECTION
1 – 8" SLEEVE, 12" LONG
10 L.F. 8" PIPE
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC, SHT. 16)

29 STA. 6+24
1 – 3/4" ARV
1 – ARV VALVE BOX

30 STA. 5+85.64
1 – 12" 1/32 BEND

A DEMOLISH VALVE BOX SALVAGE FRAME AND COVER

C CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE

02-031A

GRAPHIC SCALES:
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

PLAN AND PROFILE "A"
STA. 4+00 TO STA. 8+00

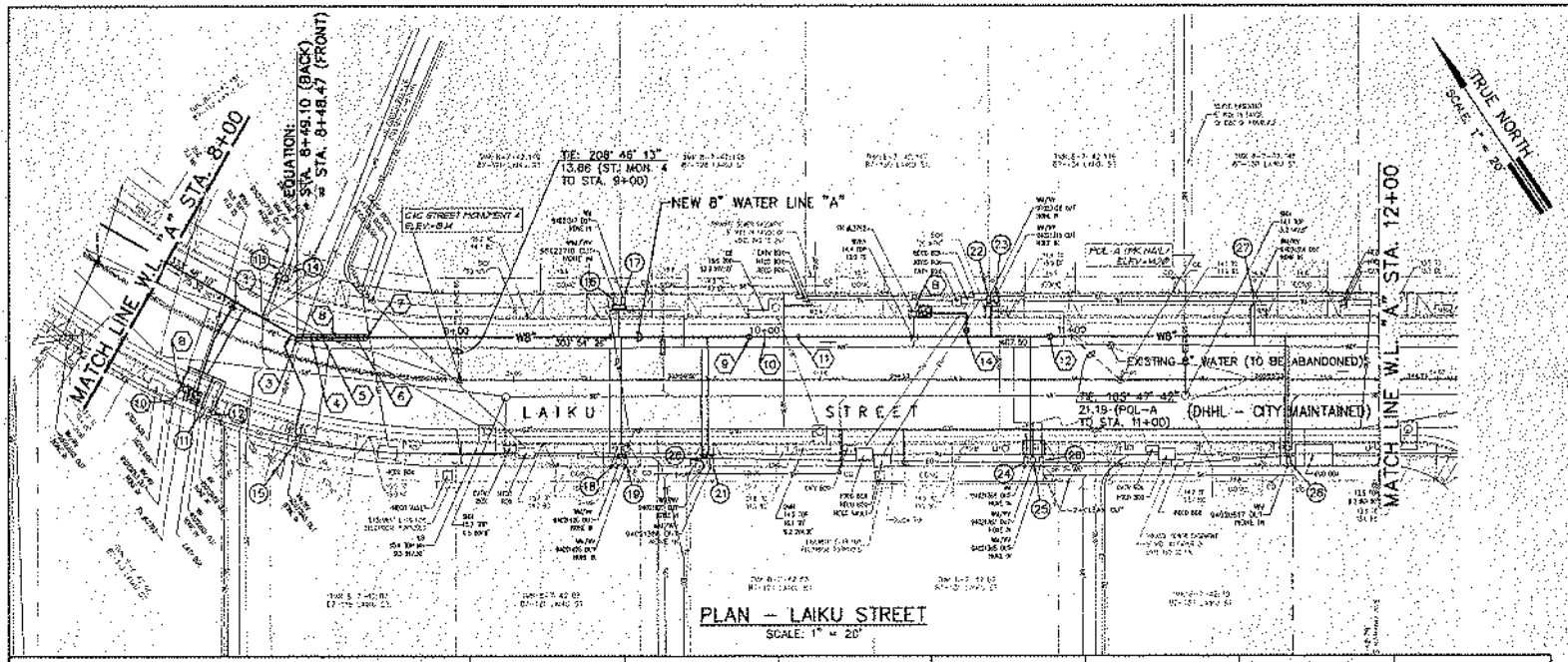
LESTER H. FUKUNAGA LICENSED PROFESSIONAL ENGINEER No. 4498-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

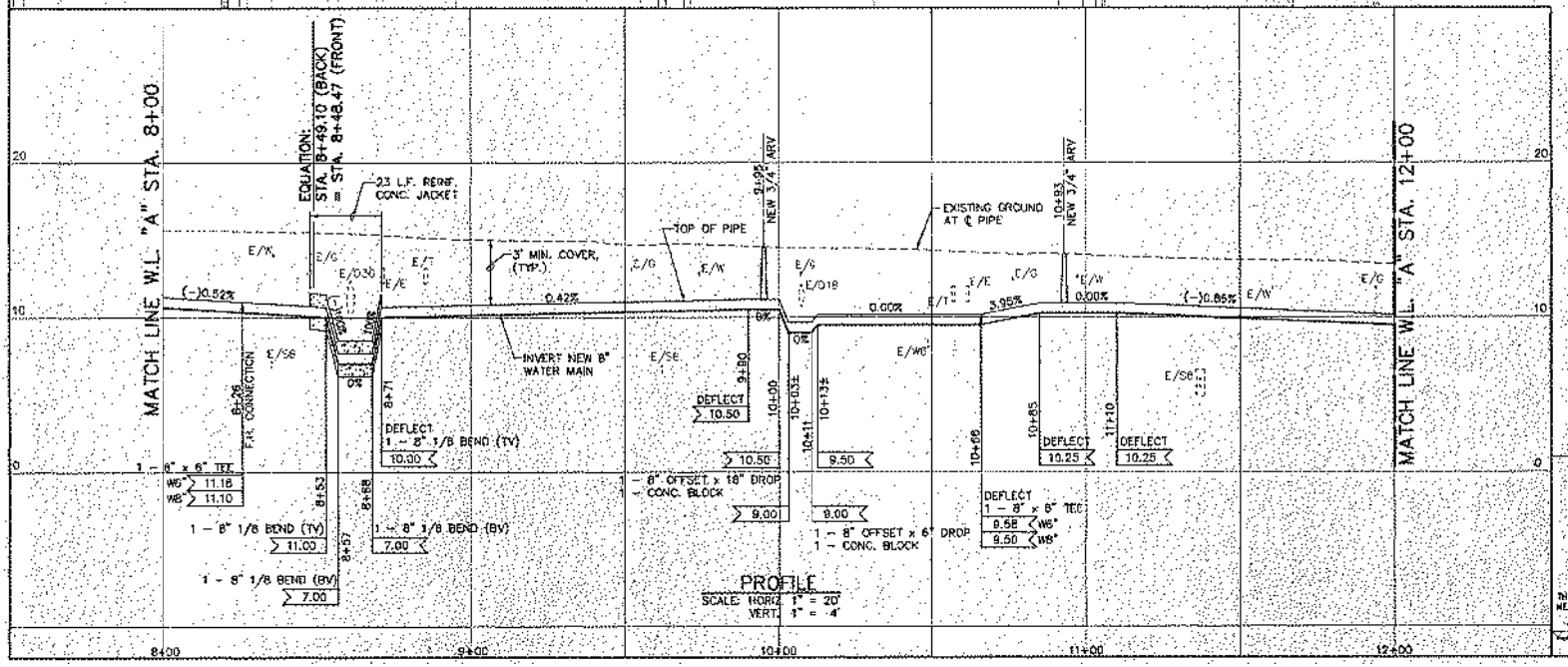
APPROVED: Harold K. Sakata, DISTRICT MAINTENANCE UNIT, BWS DATE: 9/5/02

DRAWN BY: CDK | ENGINEER: KFH | CHECKED BY: LHF | TRC NO.

FIELD BOOK NO. | SCALE: AS NOTED | SHEET 7 OF 31 SHEETS



PLAN – LAIKU STREET
SCALE: 1" = 20'



PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

1. STA. 8+26
F.H. CONNECTION
1 – 8" x 6" TEE
1 – 6" GATE VALVE, CL. 150
1 – VALVE BOX
1 – 6" 1/32 BEND
1 – F.H. (HT. = 5'–6")
3 – CONC. BLOCKS
1 – CONC. SLAB
1 – F.H. REFLECTIVE MARKER
33 L.F. 6" PIPE
(SEE F.H. PROFILE, SHT. 17)

2. STA. 8+31.84
DEFLECTION PT.

3. STA. 8+49.10
1 – 8" 1/8 BEND
1 – 8" 1/32 BEND (MJ x PE)

4. STA. 8+53
1 – 8" 1/8 BEND (TV)

5. STA. 8+57
1 – 8" 1/8 BEND (BV)

6. STA. 8+68
1 – 8" 1/8 BEND (BV)

7. STA. 8+71
1 – 8" 1/8 BEND (TV)

8. 23 L.F. REINF. CONC. JACKET ("W8")
NOTE: EXTEND JACKET TO INCLUDE 8" – 1/8 AND 1/32 BENDS AT STA. 8+49

9. STA. 9+95
1 – ARV 3/4"
1 – ARV VALVE BOX

10. STA. 10+00
1 – 8" OFFSET x 18" DROP
1 – CONC. BLOCK

11. STA. 10+11
1 – 8" OFFSET x 6" DROP, VERT.
1 – CONC. BLOCK

12. STA. 10+93
1 – 3/4 ARV
1 – ARV VALVE BOX

14. STA. 10+66
F.H. CONNECTION
1 – 8" x 6" TEE
1 – 6" GATE VALVE, CL. 150
1 – VALVE BOX
1 – 6" 1/4 BEND
1 – F.H. (HT. = 5'–6")
3 – CONC. BLOCKS
1 – F.H. REFLECTIVE MARKER
1 – CONC. SLAB
21 L.F. 6" PIPE
(SEE F.H. PROFILE, SHT. 18)

9. SALVAGE EXISTING F.H. AND C.I. FRAME AND COVER DEMOUSH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER

02-031A

GRAPHIC SCALES:
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

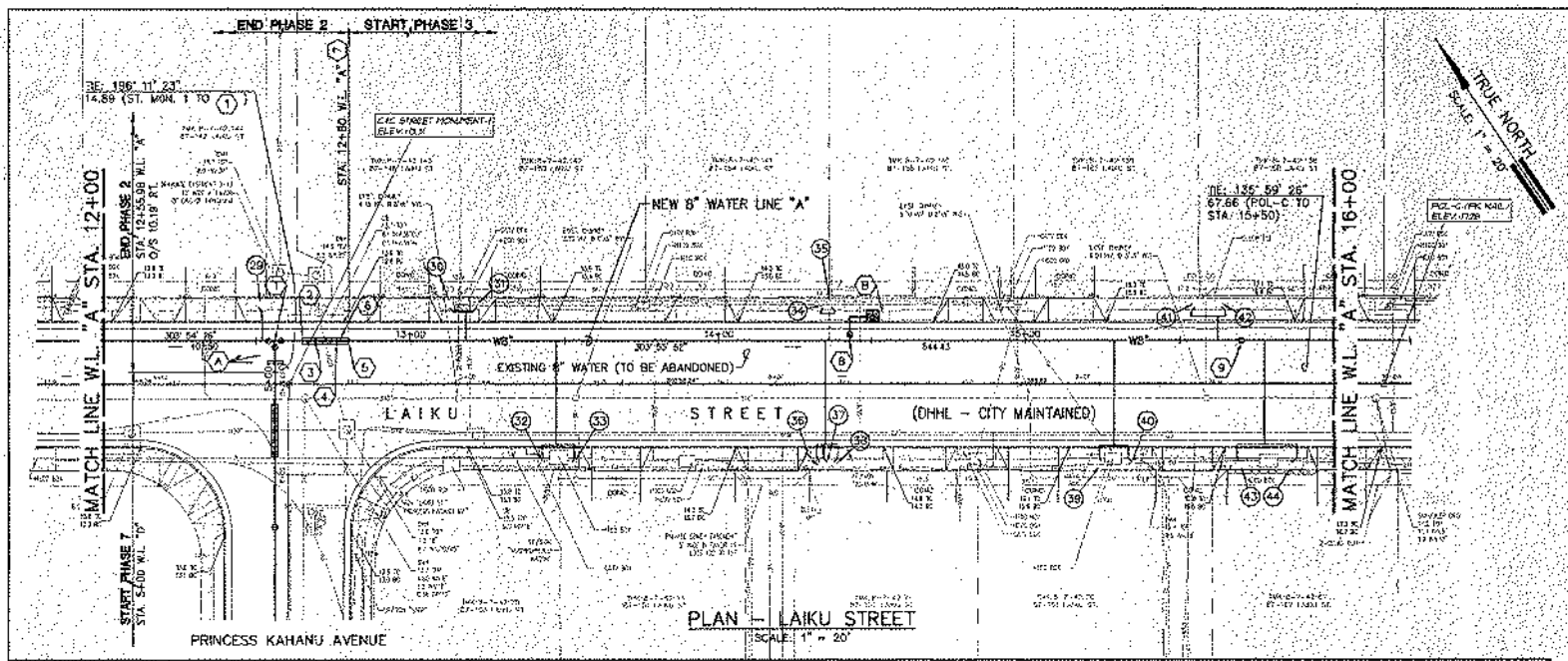
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
WAHIAWA, OAHU, HAWAII
PLAN AND PROFILE W.L. "A"
STA. 8+00 TO STA. 12+00

LESTER M. FURUYA LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Water Supply Engineer
DATE: 2/5/02

DRAWN BY: CDK | CHECKED BY: | CHECKED BY: LMF | ECC NO.
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 8 OF 31 SHEETS

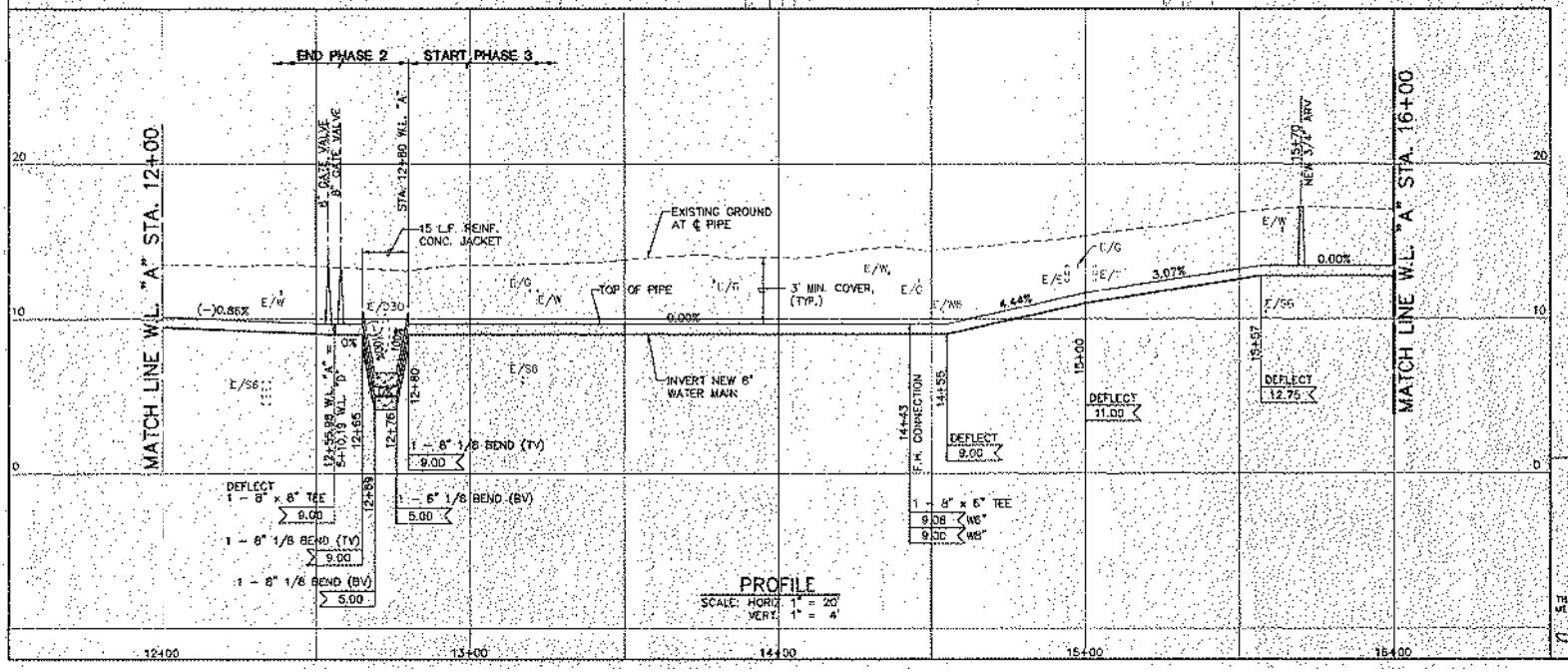


PLAN - LAIKU STREET
SCALE: 1" = 20'

1. STA. 12+56.98 W.L. "A" = STA. 5+10.19 W.L. "D"
   1 - 8" x 8" TEE
   3 - 8" GATE VALVES
   3 - VALVE BOXES
   1 - CONC. BLOCK
   1 - CONC. BEAM W/REVERSE BELL
2. STA. 12+65
   1 - 8" 1/8 BEND (TV)
3. STA. 12+69
   1 - 8" 1/8 BEND (BV)
4. STA. 12+76
   1 - 8" 1/8 BEND (BV)
5. STA. 12+80
   1 - 8" 1/8 BEND (TV)
6. 15 L.F. REINF. CONC. JACKET (WS")
7. STA. 12+80 (END PHASE 2)
   TEMPORARY FOR TESTING
   1 - 8" CAP WITH 2 1/2" C.O.
   1 - CONC. BLOCK
   STA. 12+80 (START PHASE 3)
   REMOVE 8" CAP AND CONC. BLOCK AND CONNECT PHASE 3 TO PHASE 2
   MATERIALS FOR CONNECTION
   1 - 8" SLEEVE, 12" LONG
   10 L.F. 8" PIPE
   TEMPORARY FOR TESTING
   1 - 8" CAP WITH 2 1/2" C.O.
   1 - CONC. BLOCK
   (SEE CONNECTION SCHEMATIC, SHT. 14)
8. STA. 14+43
   F.H. CONNECTION
   1 - 8" x 8" TEE
   1 - 8" GATE VALVE, CL. 150
   1 - VALVE BOX
   1 - 8" 1/4 BEND
   1 - F.H. (HT. = 6'-0")
   3 - CONC. BLOCKS
   1 - CONC. SLAB
   1 - F.H. REFLECTIVE MARKER
   15 L.F. 6" PIPE
   (SEE F.H. PROFILE, SHT. 18)
9. STA. 15+70
   1 - 3/4" ARV
   1 - ARV VALVE BOX

A. DEMOLISH VALVE BOX. SALVAGE FRAME AND COVER

B. SALVAGE EXISTING F.H. AND C.I. FRAME AND COVER. DEMOLISH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER



PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

02-031A

GRAPHIC SCALES:
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

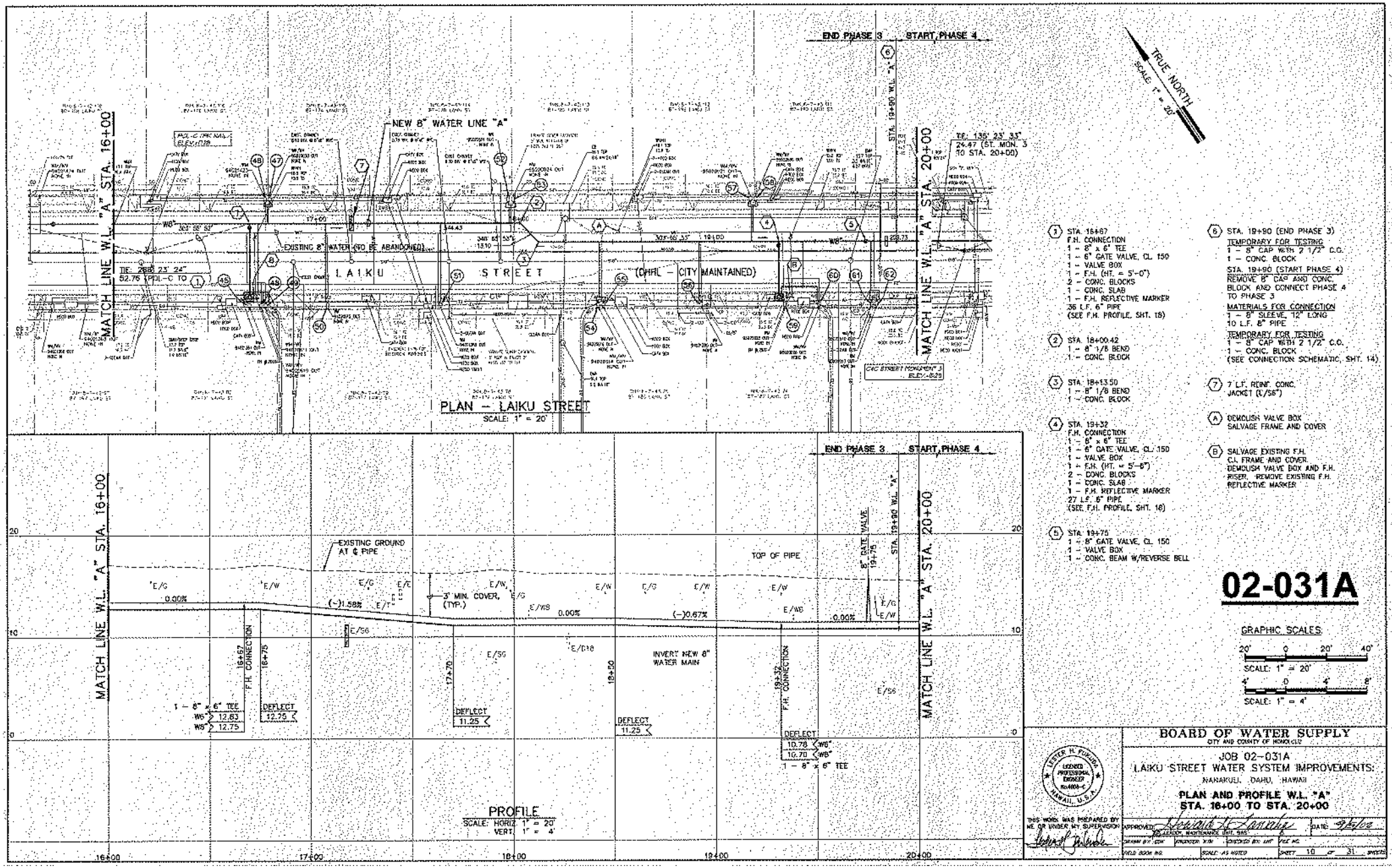
PLAN AND PROFILE W.L. "A"
STA. 12+00 TO STA. 16+00

LESTER H. FUNUICH
LICENSED PROFESSIONAL ENGINEER
No. 4706-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Howard K. Sawada, MANAGER AND CHIEF ENGINEER
DATE: 3/16/06

DRAWN BY: DW | CHECKED BY: KW | CHECKED BY: LHF | FILE NO.:
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 9 OF 31 SHEETS



LESTER H. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 4809-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

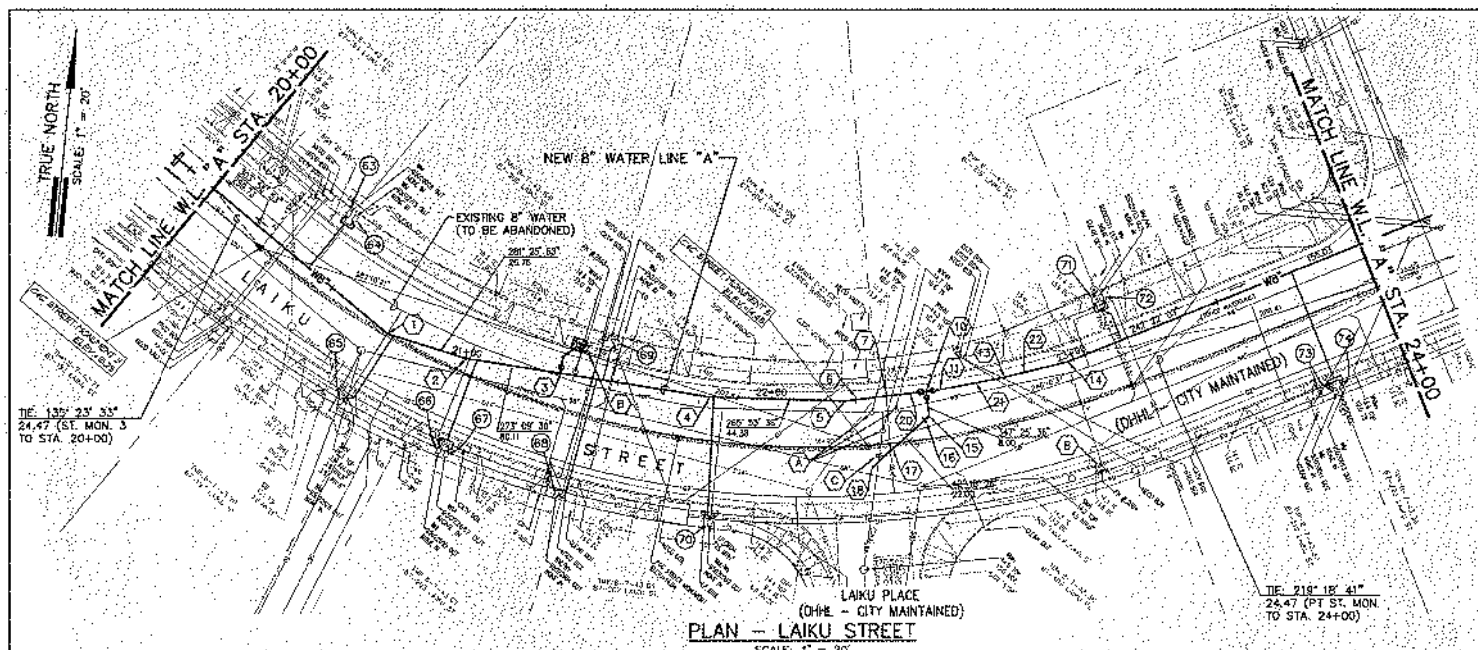
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
WAIANAE, OAHU, HAWAII

PLAN AND PROFILE W.L. "A"
STA. 16+00 TO STA. 20+00

APPROVED: Howard H. Takenaka, MAINTENANCE UNIT, GAS — DATE: 9/5/02

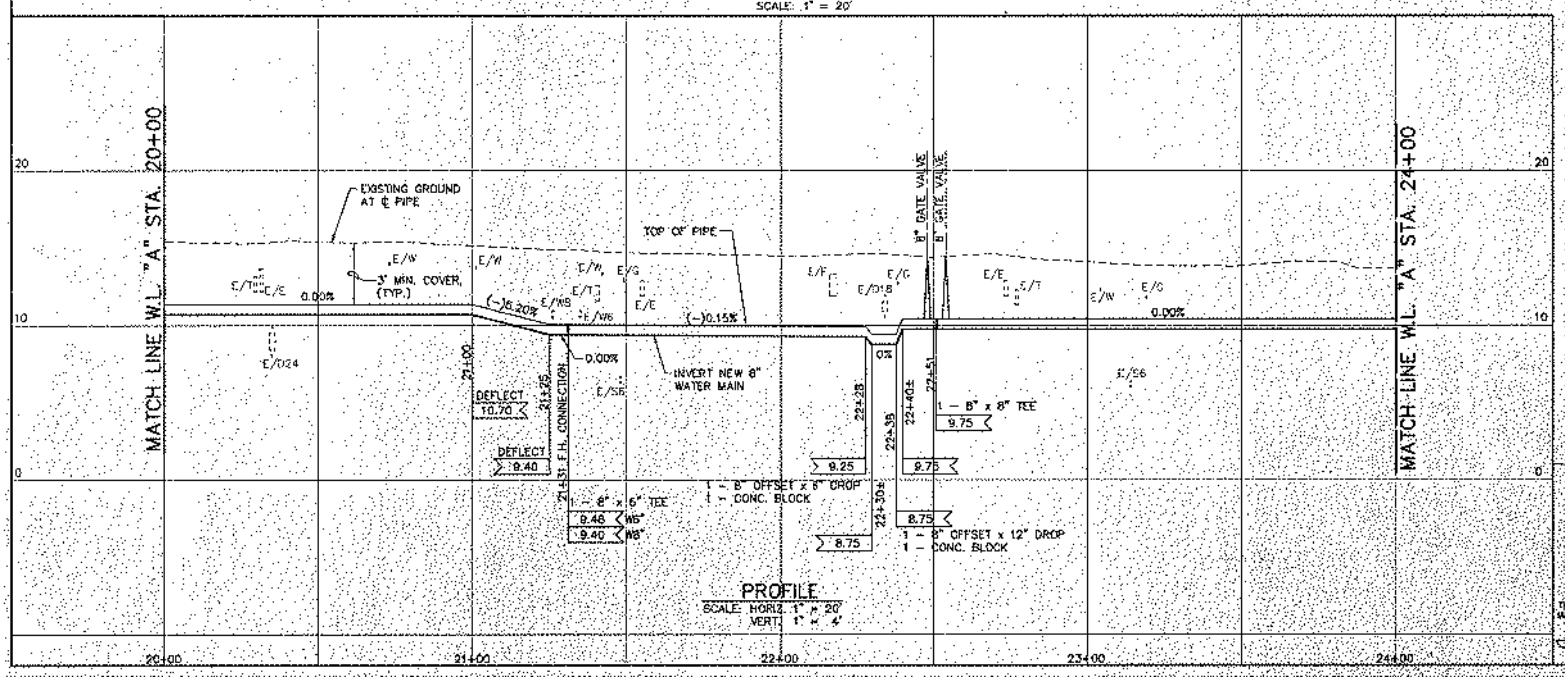
DRAWN BY: CW | CHECKED: KW | CHECKED BY: LHF | FILE NO.

FIELD BOOK NO. | SCALE: AS NOTED | SHEET 10 OF 31 SHEETS



PLAN – LAIKU STREET

SCALE: 1" = 20'



PROFILE

SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

1. STA. 20+73.24
   1 – 8" 1/8 BEND
   1 – CONC. BLOCK
2. STA. 21+00
   DEFLECTION PT.
   1 – 8" 1/32 BEND
   1 – CONC. BLOCK
3. STA. 21+31
   F.H. CONNECTION
   1 – 8" x 6" TEE
   1 – 6" GATE VALVE, CL. 150
   1 – VALVE BOX
   1 – 6" 1/8 BEND
   1 – F.H. (HT. = 6'-0")
   3 – CONC. BLOCKS
   1 – CONC. SLAB
   1 – F.H. REFLECTIVE MARKER
   11 L.F. 6" PIPE
   (SEE F.H. PROFILE, SHT. 18)
4. STA. 21+80.11
   DEFLECTION PT.
   1 – 8" 1/32 BEND
   1 – CONC. BLOCK
5. STA. 22+24.49
   DEFLECTION PT.
   1 – 8" 1/32 BEND
   1 – CONC. BLOCK
6. STA. 22+28
   1 – 8" OFFSET x 6" DROP
   1 – CONC. BLOCK
7. STA. 22+36
   1 – 8" OFFSET x 12" DROP
   1 – CONC. BLOCK
10. STA. 22+51 W.L. "A" = STA. 0+00 W.L. "AC"
    1 – 8" x 8" TEE
    3 – 8" GATE VALVES, CL. 150
    3 – VALVE BOXES
    1 – CONC. BLOCK
    26 L.F. 8" PIPE (W.L. "AC")
11. STA. 22+55.56
    DEFLECTION PT.
13. STA. 22+76.84
    DEFLECTION PT.
14. STA. 22+97.93
    DEFLECTION PT.
    1 – 8" 1/32 BEND
    1 – CONC. BLOCK
15. STA. 0+08 W.L. "AC"
    1 – 8" 1/8 BEND
    1 – 8" 1/32 BEND (BV-MJ x PE)
    2 – CONC. BLOCKS
16. STA. 0+13 W.L. "AC"
    1 – 8" OFFSET – 12" DROP
17. SEE SHT. 17 FOR PROFILE OF INTERCONNECTION TO 8" WATER ON LAIKU PLACE
18. STA. 0+30 W.L. "AC"
    CONNECTION TO 8" WATER ON LAIKU PLACE
    1 – CONC. BLOCK WITH STRUC. STRUT
    MATERIALS FOR CONNECTION
    1 – 8" 1/8 BEND
    8 L.F. 8" PIPE
    2 – 8" SLEEVES, 12" LONG
    TEMPORARY FOR TESTING
    1 – 8" CAP WITH 2 1/2" C.O.
    1 – CONC. BLOCK
    (SEE CONNECTION SCHEMATIC, SHT. 19 AND PROFILE W.L. "AC", SHT. 17)
20. W.L. "A" TRAVERSE
    257° 25' 36" —— 31.06
21. W.L. "A" TRAVERSE
    253° 10' 35" —— 21.29
22. W.L. "A" TRAVERSE
    250° 10' 36" —— 21.09

A. DEMOLISH VALVE BOX. SALVAGE FRAME AND COVER
B. SALVAGE EXISTING F.H. C.I. FRAME AND COVER. DEMOLISH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER
C. CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE

02-031A

GRAPHIC SCALES:

20' 0 20' 40'
SCALE: 1" = 20'

4' 0 4' 8'
SCALE: 1" = 4'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

PLAN AND PROFILE W.L. "A" STA. 20+00 TO STA. 24+00

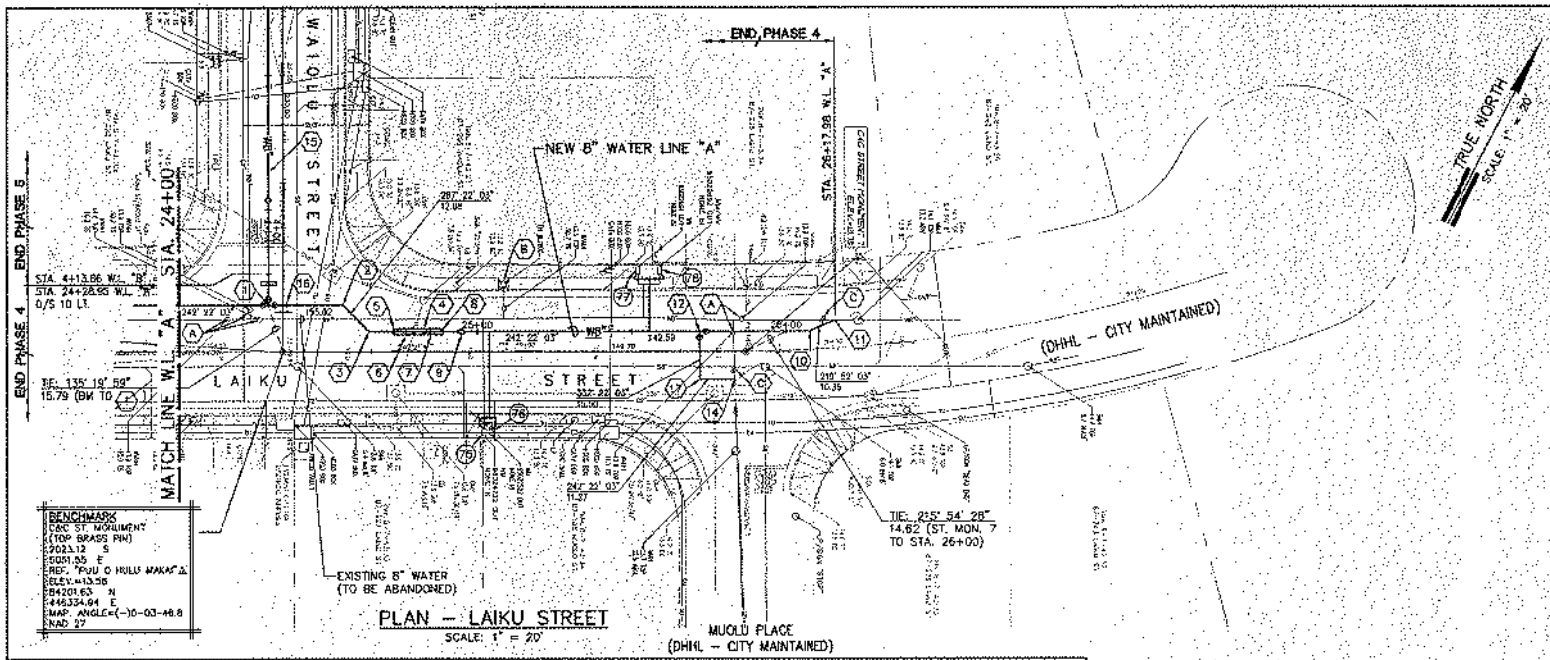
LESTER N. FUKUDA — LICENSED PROFESSIONAL ENGINEER — No. 4909-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

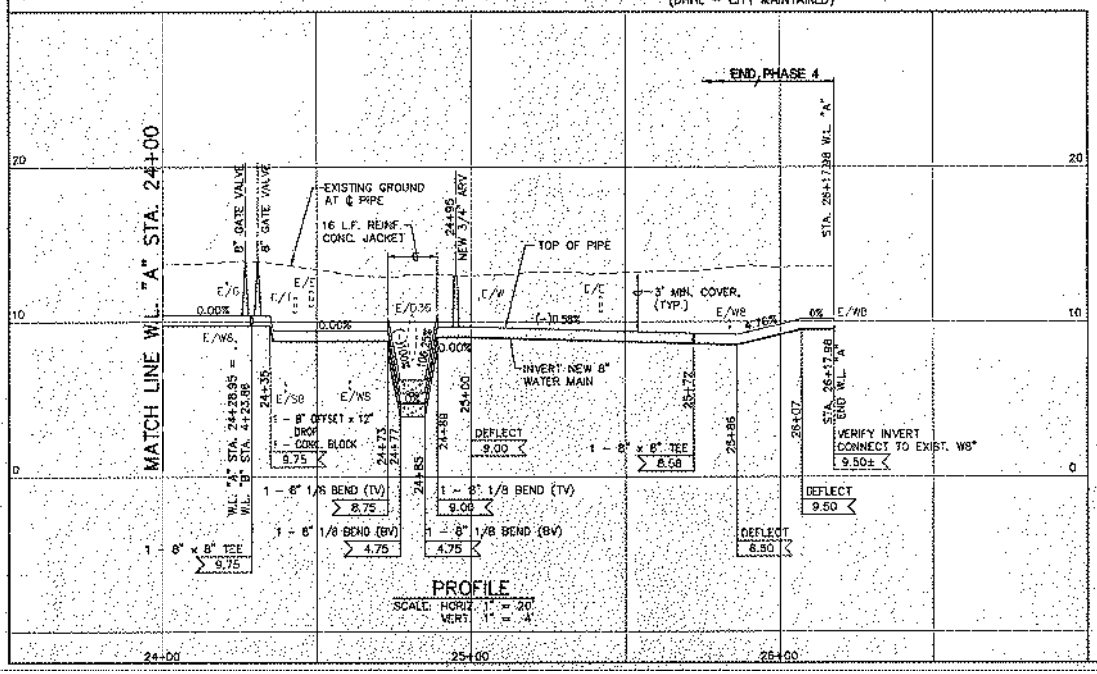
APPROVED: _____ for MANAGER, MAINTENANCE DIVISION DATE: 9/5/02

DRAWN BY: CW | CHECKED BY: | CHECKED BY: | TRC NO.

FIELD BOOK NO. | SCALE AS NOTED | SHEET 11 OF 31 SHEETS



PLAN – LAIKU STREET
SCALE: 1" = 20'



PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

1. STA. 24+28.95 W.L. "A" = STA. 4+23.86 W.L. "B"
   3 – 8" GATE VALVES, CL. 150
   3 – VALVE BOXES
   1 – CONC. BLOCK
   1 – 8" x 8" TEE
   1 – CONC. BEAM W/REVERSE BELL
   10 L.F. 8" PIPE
2. STA. 24+52.95
   1 – 8" 1/8 BEND
   1 – CONC. BLOCK
3. STA. 24+85.03
   1 – 8" 1/8 BEND
   1 – CONC. BLOCK
4. 16 L.F. REINF. CONC. JACKET (W8")
5. STA. 24+73
   1 – 8" 1/8 BEND (TV)
6. STA. 24+77
   1 – 8" 1/8 BEND (BV)
7. STA. 24+85
   1 – 8" 1/8 BEND (BV)
8. STA. 24+89
   1 – 8" 1/8 BEND (TV)
9. STA. 24+95
   1 – 3/4" ARV
   1 – ARV VALVE BOX
10. STA. 26+07.62
    1 – 8" 1/16 BEND
    1 – CONC. BLOCK
11. STA. 26+17.98
    CONNECT TO EXISTING 8" WATER
    1 – CONC. BLOCK WITH STRUC. STRUT
    MATERIALS FOR CONNECTION
    1 – 8" 1/16 BEND
    10 L.F. 8" PIPE
    2 – 8" SLEEVES, 12" LONG
    TEMPORARY FOR TESTING
    1 – 8" CAP WITH 2 1/2" C.O.
    1 – CONC. BLOCK
    (SEE CONNECTION SCHEMATIC, SHT. 19)
12. STA. 25+72 W.L. "A" = STA. 0+00 W.L. "AD"
    2 – 8" GATE VALVES, CL. 150
    2 – VALVE BOXES
    1 – 8" x 8" TEE
    1 – CONC. BLOCK
    20 L.F. 8" PIPE (W.L. "AD")
14. STA. 0+28.77 W.L. "AD"
    CONNECT TO EXISTING W8" (PVC)
    1 – CONC. BLOCK WITH STRUC. STRUT
    MATERIALS FOR CONNECTION
    1 – 8" 1/4 BEND (PE/M.J) (H&TV)
    10 L.F. 8" PIPE
    1 – 8" SLEEVE, 12" LONG
    TEMPORARY FOR TESTING
    1 – 8" CAP WITH 2 1/2" C.O.
    1 – CONC. BLOCK
    (SEE CONNECTION SCHEMATIC, SHT. 19 AND PROFILE W.L. "AD", SHT. 17)
15. WATER LINE "B" – FOR PLAN AND PROFILE SEE SHEET 13
16. STA. 24+35
    1 – 8" OFFSET x 12" DROP
17. STA. 0+15.5 W.L. "AD"
    1 – 8" 1/4 BEND
    1 – CONC. BLOCK

(A) DEMOLISH VALVE BOX, SALVAGE FRAME AND COVER
(B) SALVAGE EXISTING F.H. C.I. FRAME AND COVER. DEMOLISH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER.
(C) CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE.

GRAPHIC SCALES:
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

LESTER H. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 9108-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

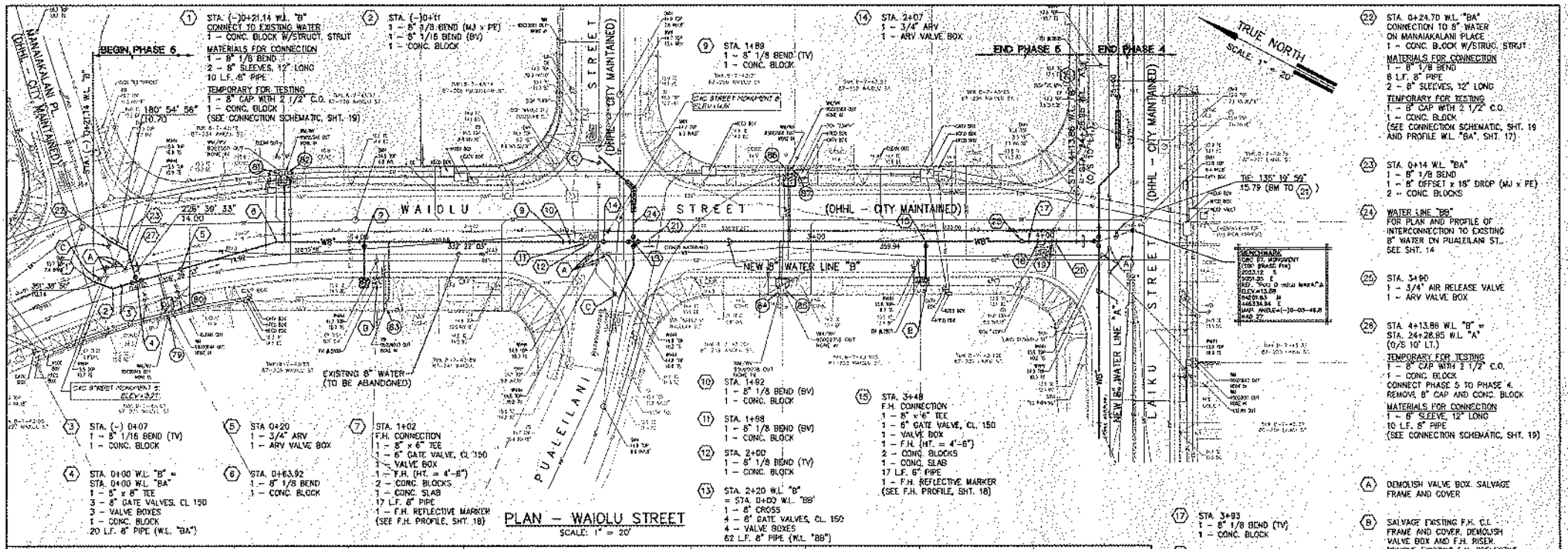
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

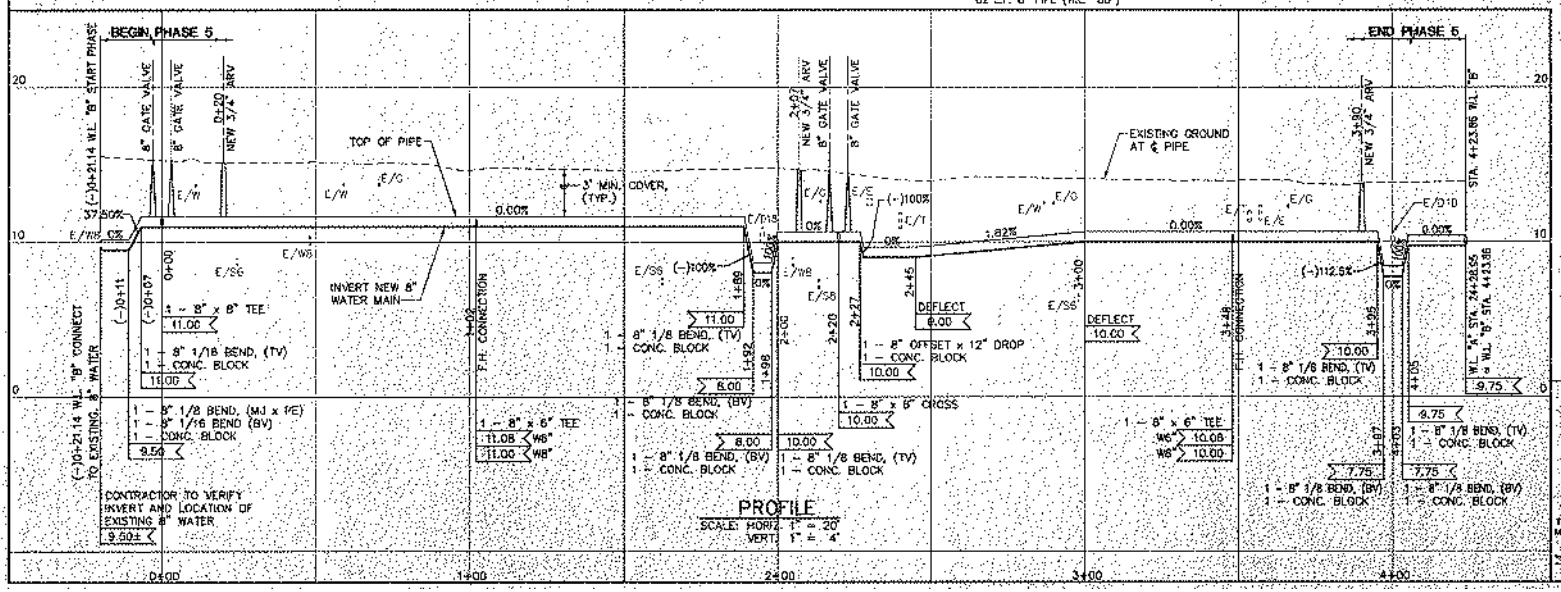
PLAN AND PROFILE W.L. "A" STA. 24+00 TO END

02-031A

APPROVED: Engineer & Manager, BWS — DATE: 9/5/02
DRAWN BY: CSF | TRACED BY: KTN | CHECKED BY: LHF | FILE NO.
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 12 OF 31 SHEETS



PLAN – WAIOLU STREET
SCALE: 1" = 20'



PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'

GRAPHIC SCALES
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII
PLAN AND PROFILE W.L. "B" STA. (-)0+21.14 TO END

LESTER N. FURUYA LICENSED PROFESSIONAL ENGINEER No. 6908-E HAWAII, U.S.A.

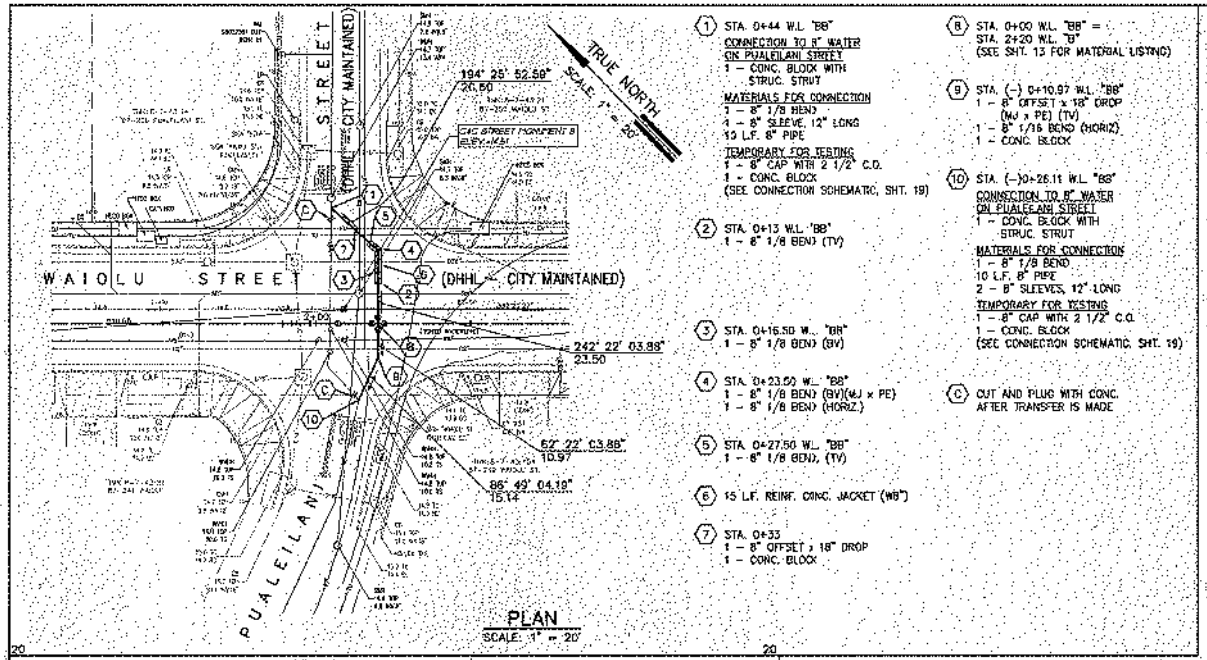
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Manager and Chief Engineer

DATE: 9/5/02

DRAWN BY: JOW | DESIGNED: WM | DESIGNED BY: LNF | FILE NO.

FIELD BOOK NO. | SCALE AS NOTED | SHEET 13 OF 31 SHEETS



PLAN
SCALE: 1" = 20'

(1) STA. 0+44 W.L. "BB"
CONNECTION TO 8" WATER ON PUALEILANI STREET
1 – CONC. BLOCK WITH STRUC. STRUT
MATERIALS FOR CONNECTION
1 – 8" 1/8 BEND
4 – 8" SLEEVE, 12" LONG
19 L.F. 8" PIPE
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC, SHT. 19)

(2) STA. 0+13 W.L. "BB"
1 – 8" 1/8 BEND (TV)

(3) STA. 0+16.50 W.L. "BB"
1 – 8" 1/8 BEND (BV)

(4) STA. 0+23.50 W.L. "BB"
1 – 8" 1/8 BEND (BV)(MJ x PE)
1 – 8" 1/8 BEND (HORIZ.)

(5) STA. 0+27.50 W.L. "BB"
1 – 8" 1/8 BEND, (TV)

(6) 15 L.F. REINF. CONC. JACKET (WB")

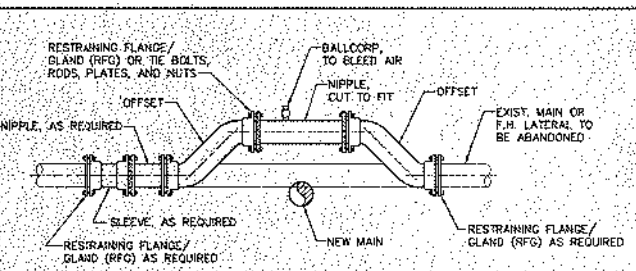
(7) STA. 0+33
1 – 8" OFFSET x 18" DROP
1 – CONC. BLOCK

(8) STA. 0+00 W.L. "BB" = STA. 2+20 W.L. "B"
(SEE SHT. 13 FOR MATERIAL LISTING)

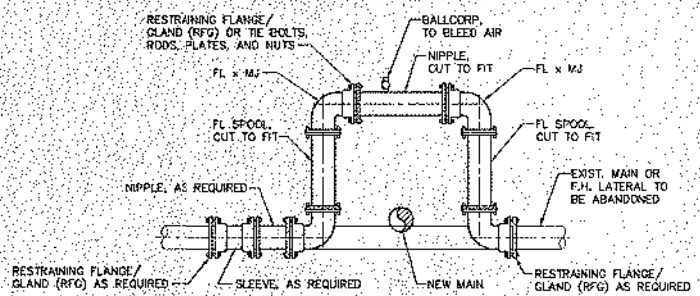
(9) STA. (–) 0+10.97 W.L. "BB"
1 – 8" OFFSET x 18" DROP (MJ x PE) (TV)
1 – 8" 1/16 BEND (HORIZ)
1 – CONC. BLOCK

(10) STA. (–)0+26.11 W.L. "BB"
CONNECTION TO 8" WATER ON PUALEILANI STREET
1 – CONC. BLOCK WITH STRUC. STRUT
MATERIALS FOR CONNECTION
1 – 8" 1/8 BEND
10 L.F. 8" PIPE
2 – 8" SLEEVES, 12" LONG
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC, SHT. 19)

(C) CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE



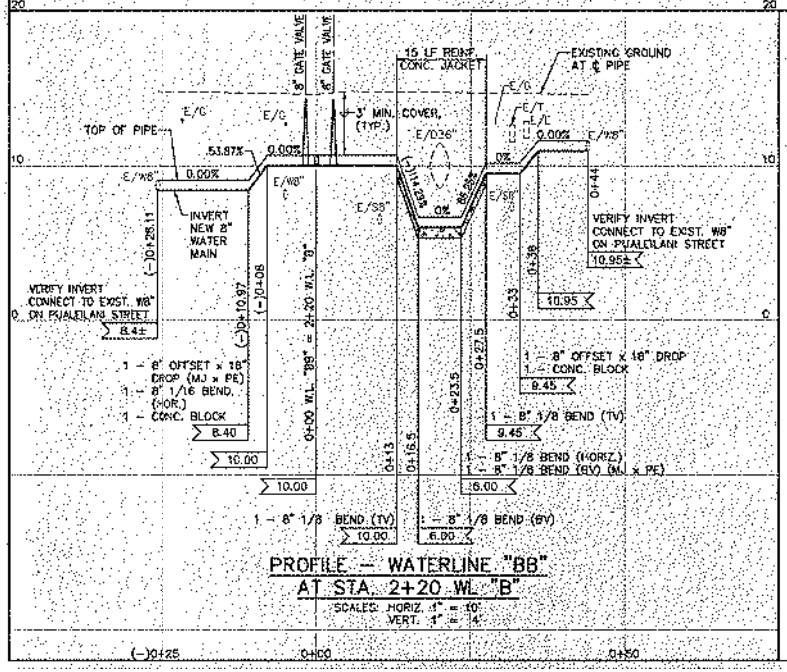
OFFSET ALTERNATIVE



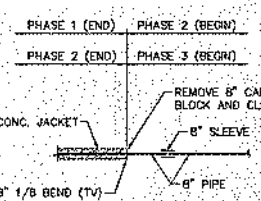
1/4 BEND ALTERNATIVE

NOTES:
1. CONTRACTOR SHALL LOCATE, CROSSING AND VERIFY INVERT.
2. IF A CONFLICT BETWEEN THE EXISTING AND NEW MAINS WILL OCCUR, CONTRACTOR SHALL PROVIDE A TEMPORARY BY–PASS.
3. TEMPORARY BY–PASS SHALL BE REMOVED AFTER NEW MAIN IS IN SERVICE AND LATERALS HAVE BEEN TRANSFERRED. PLUG EXISTING ENDS WITH CONCRETE.
4. PRIOR TO EXCAVATING NEAR OR AROUND THE EXISTING WATER SYSTEM, THE CONTRACTOR SHALL RESTRAIN ALL EXISTING PIPES, FITTINGS, VALVES, BLOCKS, ETC. AS REQUIRED TO ENSURE THE EXISTING SYSTEM IS NOT DISTURBED.
5. ALL JOINTS SHALL BE TESTED TO THE PREVAILING LINE PRESSURE. ALL JOINTS SHALL BE LEFT EXPOSED FOR 24 HOURS TO CHECK FOR LEAKS PRIOR TO BACKFILL.
6. THE CONTRACTOR SHALL SWAB TO CHLORINATE THE ENTIRE INSIDE SURFACE OF ALL NEW PIPES AND FITTINGS WITH DISINFECTION SOLUTION OF 5 OUNCES OF SODIUM HYPOCHLORITE MIXED WITH 10 GALLONS OF WATER.
7. CONTRACTOR TO PROVIDE TRANSITION COUPLINGS AS REQUIRED TO MEET FIELD CONDITIONS.

TEMPORARY BY–PASS DETAIL
NOT TO SCALE

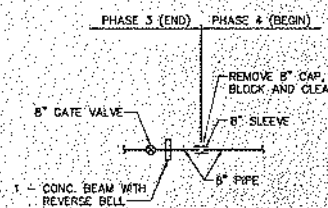


PROFILE – WATERLINE "BB" AT STA. 2+20 W.L. "B"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



(PH. 1 TO PH. 2, PH. 2 TO PH. 3)

CONNECTION SCHEMATIC
NOT TO SCALE



(PH. 3 TO PH. 4)

CONNECTION SCHEMATIC
NOT TO SCALE

GRAPHIC SCALES
20' 10' 0 20' 60'
SCALE: 1" = 20'
10' 0 10' 20'
SCALE: 1" = 10'
4' 0 4' 8'
SCALE: 1" = 4'

LESTER N. FURUYA LICENSED PROFESSIONAL ENGINEER No. 14403-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

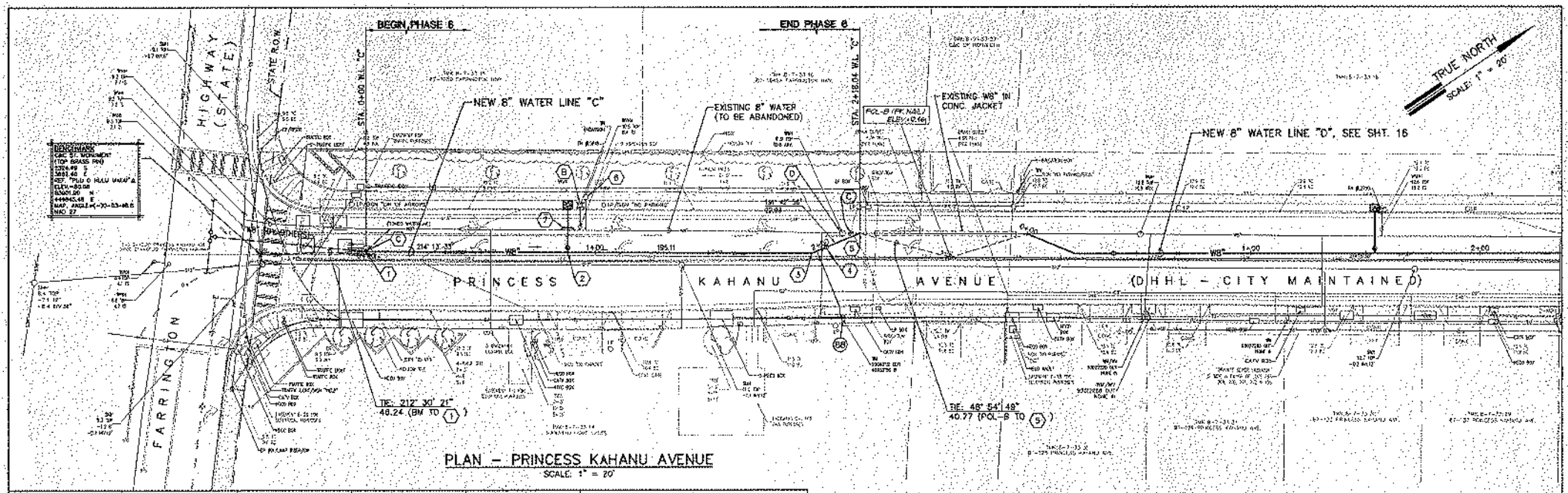
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02–031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

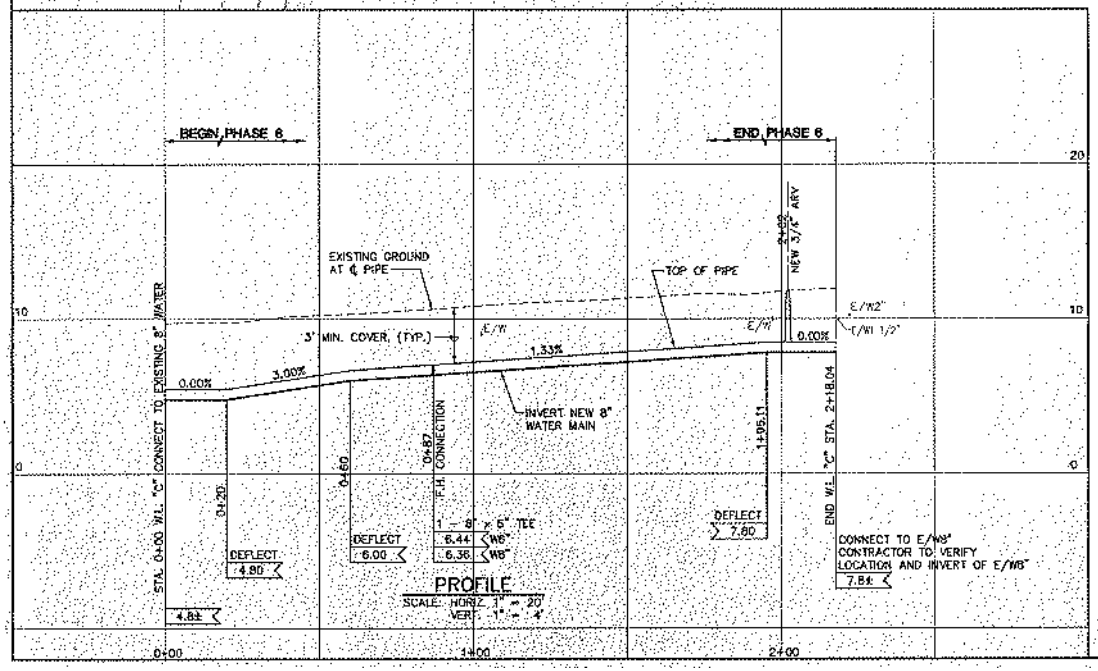
PLAN AND PROFILE W.L. "BB" AT STA. 2+20 W.L. "B", CONNECTION SCHEMATICS AND MISCELLANEOUS DETAIL

APPROVED: Kenneth K. Fujioka, LEASES, MAINTENANCE UNIT, BWS — DATE: 9/6/02
DRAWN BY: TYU | CHECKED BY: KCH | CHECKED BY: LNF | FILE NO.
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 14 OF 31 SHEETS

02-031A



PLAN – PRINCESS KAHANU AVENUE
SCALE: 1" = 20'



1 STA. 0+00
CONNECTION TO 8" WATER ON PRINCESS KAHANU AVE.
REMOVE EXISTING 1/8 BEND AND CONC. BLOCK
MATERIALS FOR CONNECTION
1 – 8" SLEEVE, 12" LONG
10 L.F. 8" PIPE
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC SHT. 19)

2 STA. 0+87
F.H. CONNECTION
1 – 8" x 6" TEE
1 – 8" GATE VALVE, CL. 150
1 – VALVE BOX
1 – F.H. (HT. = 5'-0")
2 – CONC. BLOCKS
1 – CONC. SLAB
17 L.F. 6" PIPE
1 – F.H. REFLECTIVE MARKER
(SEE F.H. PROFILE, SHT. 16)

3 STA. 1+95.11
1 – 8" 1/16 BEND
1 – CONC. BLOCK

4 STA. 2+02
1 – 3/4" ARV
1 – ARV VALVE BOX

5 STA. 2+18.04
CONNECTION TO 8" WATER ON PRINCESS KAHANU AVE.
1 – CONC. BLOCK W/8" STRUC. STRUT
MATERIALS FOR CONNECTION
1 – 8" SLEEVE, 12" LONG
10 L.F. 8" PIPE
4 L.F. 4" PVC PIPE
1 – 8" 1/16 BEND
TEMPORARY FOR TESTING
1 – 8" CAP WITH 2 1/2" C.O.
1 – CONC. BLOCK
(SEE CONNECTION SCHEMATIC SHT. 19)

6 REMOVE METER BOX, BACKFILL AND REPAIR PAVEMENT TO MATCH EXISTING CONDITION

7 TEMPORARY BY-PASS FOR EXISTING 8" WATER, SEE TEMPORARY BY-PASS DETAIL, SHEET 14

A DEMOLISH VALVE BOX. SALVAGE FRAME AND COVER

B SALVAGE EXISTING F.H. AND C.I. FRAME AND COVER. DEMOLISH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER

C CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE

D DEMOLISH MANHOLE. SALVAGE FRAME AND COVER

GRAPHIC SCALES
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

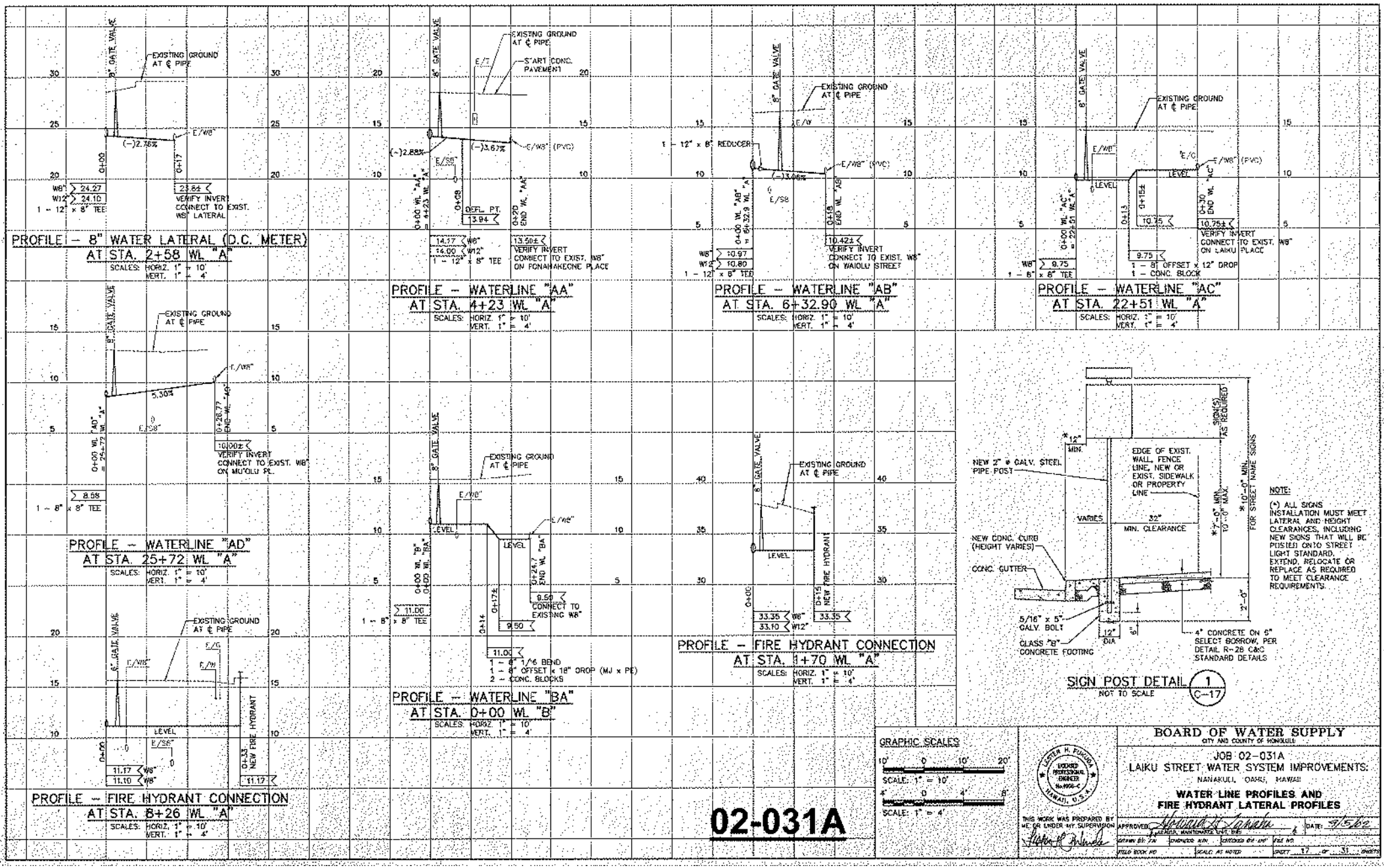
PLAN AND PROFILE W.L. "C"
STA. 0+00 TO END

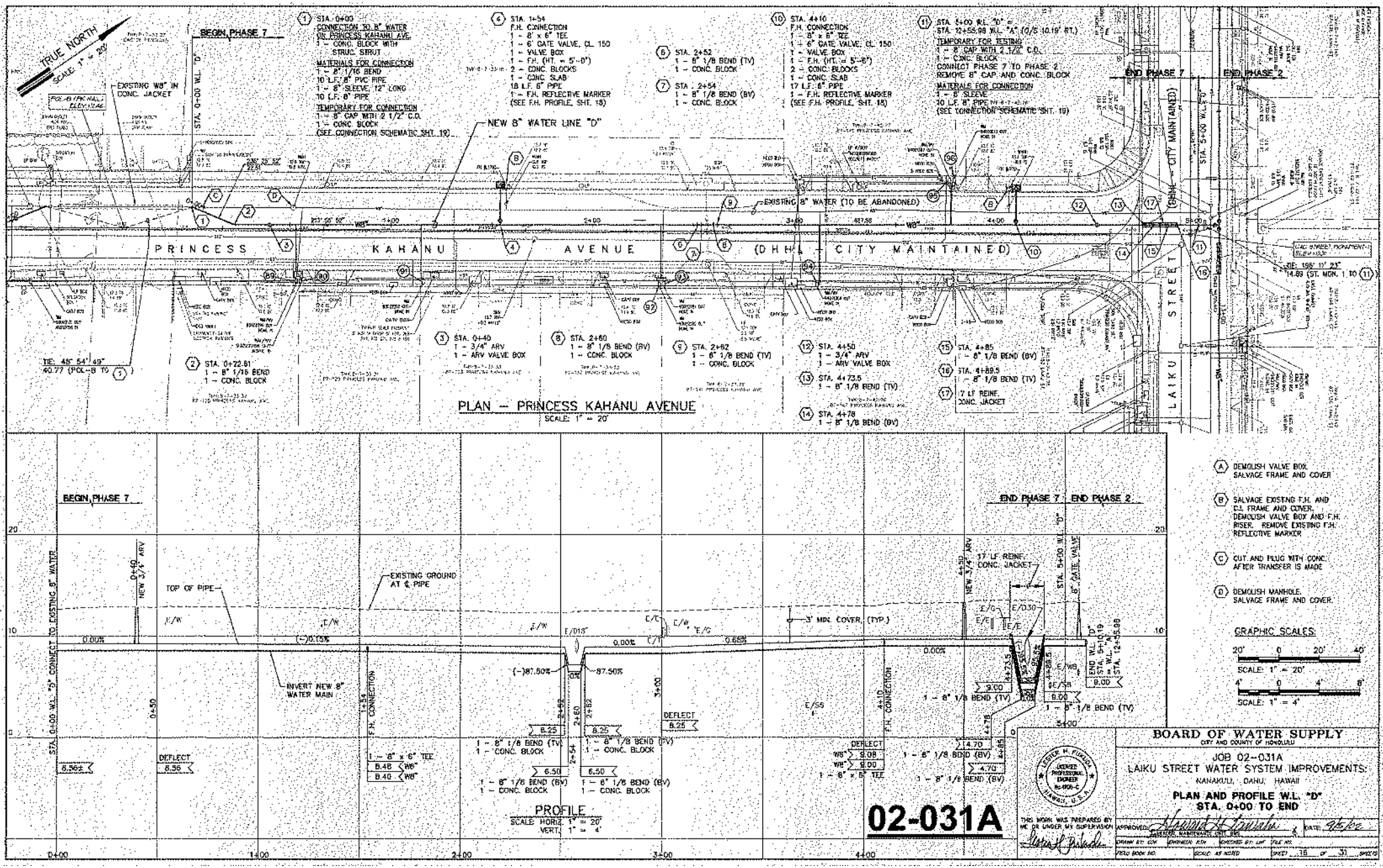
LESTER M. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 9108-C HAWAII, U.S.A.

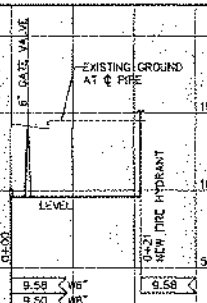
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Howard K. Takata, ENGINEER, MAINTENANCE DIST., BWS DATE: 9/15/02

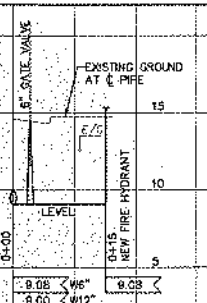
DRAWN BY: CDK | ENGINEER: KTH | CHECKED BY: LMF | FILE NO.:
FIELD BOOK NO.: | SCALE: AS NOTED | SHEET 15 OF 31 SHEETS


8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
(-)2.36%
0+00
0+17
W8" 24.27
W12" 24.10
1 - 12" x 8" TEE
23.84± VERIFY INVERT CONNECT TO EXIST. W8" LATERAL
PROFILE - 8" WATER LATERAL (D.C. METER) AT STA. 2+58 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
EXISTING GROUND AT ℄ PIPE
START CONC. PAVEMENT
E/12
(-)2.88%
(-)3.67%
E/W8" (PVC)
E/S8"
0+00 WL "AA" = 4+23 WL "A"
0+08
DEFL. PT. 13.94
0+20 END WL "AA"
14.17 W8"
14.00 W12"
1 - 12" x 8" TEE
13.50± VERIFY INVERT CONNECT TO EXIST. W8" ON PONAHAKEONE PLACE
PROFILE - WATERLINE "AA" AT STA. 4+23 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W
1 - 12" x 8" REDUCER
E/W8" (PVC)
(-)3.06%
E/S8
0+00 WL "AB" = 6+32.9 WL "A"
0+18 END WL "AB"
W8" 10.97
W12" 10.80
1 - 12" x 8" TEE
10.42± VERIFY INVERT CONNECT TO EXIST. W8" ON WAIOLU STREET
PROFILE - WATERLINE "AB" AT STA. 6+32.90 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
E/C
E/W8" (PVC)
LEVEL
0+00 WL "AC" = 22+51 WL "A"
0+13
0+15±
0+30 END WL
9.75
10.15
10.75±
1 - 8" OFFSET x 12" DROP
1 - CONC. BLOCK
W8" 9.75
1 - 8" x 8" TEE
VERIFY INVERT CONNECT TO EXIST. W8" ON LAIKU PLACE
PROFILE - WATERLINE "AC" AT STA. 22+51 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
5.30%
0+00 WL "AD" = 25+72 WL "A"
0+28.77 END WL "AD"
10.00± VERIFY INVERT CONNECT TO EXIST. W8" ON MU'OLU PL.
8.58
1 - 8" x 8" TEE
PROFILE - WATERLINE "AD" AT STA. 25+72 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
LEVEL
0+00 WL "BA" = 0+00 WL "B"
0+17±
0+24.7 END WL "BA"
11.06
1 - 8" x 8" TEE
9.50 CONNECT TO EXISTING W8"
11.00 1 - 8" 1/16 BEND 1 - 8" OFFSET x 18" DROP (MJ x PE) 2 - CONC. BLOCKS
PROFILE - WATERLINE "BA" AT STA. 0+00 WL "B"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
6" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
LEVEL
0+00
0+15
NEW FIRE HYDRANT
33.35 W8"
33.10 W12"
33.35
PROFILE - FIRE HYDRANT CONNECTION AT STA. 1+70 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
8" GATE VALVE
EXISTING GROUND AT ℄ PIPE
E/W8"
E/G
E/W
LEVEL
0+00
E/S8"
0+33
NEW FIRE HYDRANT
11.17 W8"
11.10 W8"
11.17
PROFILE - FIRE HYDRANT CONNECTION AT STA. 8+26 WL "A"
SCALES: HORIZ. 1" = 10' VERT. 1" = 4'
NEW 2" ø GALV. STEEL PIPE POST
12" MIN.
EDGE OF EXIST. WALL, FENCE LINE, NEW OR EXIST. SIDEWALK OR PROPERTY LINE
SIGN(S) AS REQUIRED
VARIES
32" MIN. CLEARANCE
*10'-0" MIN. FOR STREET NAME SIGNS
*7'-0" MIN. 10'-0" MAX.
NEW CONC. CURB (HEIGHT VARIES)
CONC. GUTTER
5/16" x 5" GALV. BOLT
12" DIA
CLASS "B" CONCRETE FOOTING
4" CONCRETE ON 6" SELECT BORROW, PER DETAIL R-28 C&C STANDARD DETAILS
2'-0"
NOTE:
(*) ALL SIGNS INSTALLATION MUST MEET LATERAL AND HEIGHT CLEARANCES, INCLUDING NEW SIGNS THAT WILL BE POSTED ONTO STREET LIGHT STANDARD. EXTEND, RELOCATE OR REPLACE AS REQUIRED TO MEET CLEARANCE REQUIREMENTS.
SIGN POST DETAIL 1 C-17
NOT TO SCALE
GRAPHIC SCALES
10' 0 10' 20'
SCALE: 1" = 10'
4' 0 4' 8'
SCALE: 1" = 4'
02-031A
LESTER H. FURUYA LICENSED PROFESSIONAL ENGINEER No. 9956-C HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII
WATER LINE PROFILES AND FIRE HYDRANT LATERAL PROFILES
APPROVED
MANAGER, MAINTENANCE DIVISION
DATE: 9/5/02
DRAWN BY: TN
CHECKED BY:
CHECKED BY:
FILE NO.
FIELD BOOK NO.
SCALE: AS NOTED
SHEET 17 OF 31 SHEETS

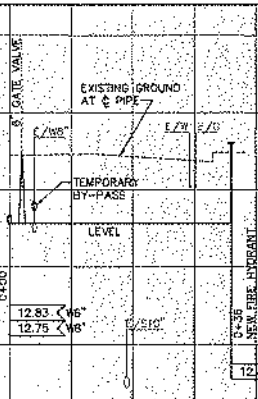

TRUE NORTH
SCALE: 1" = 20'
BEGIN PHASE 7
END PHASE 7
END PHASE 2
EXISTING W8" IN CONC. JACKET
NEW 8" WATER LINE "D"
EXISTING 8" WATER (TO BE ABANDONED)
PRINCESS KAHANU AVENUE
(DHHL - CITY MAINTAINED)
LAIKU STREET
(DHHL - CITY MAINTAINED)
STA. 0+00 W.L. "D"
STA. 5+00 W.L. "D"
TIE: 45° 54' 49" 40.77' (POL-8 TO 1)
TIE: 195° 11' 23" 14.89' (ST. MON. 1 TO 11)
1 STA. 0+00 CONNECTION TO 8" WATER ON PRINCESS KAHANU AVE. 1 - CONC. BLOCK WITH STRUC. STRUT
MATERIALS FOR CONNECTION 1 - 8" 1/16 BEND 10 L.F. 8" PVC PIPE 1 - 8" SLEEVE, 12" LONG 10 L.F. 8" PIPE
TEMPORARY FOR CONNECTION 1 - 8" CAP WITH 2 1/2" C.O. 1 - CONC. BLOCK (SEE CONNECTION SCHEMATIC SHT. 19)
2 STA. 0+22.61 1 - 8" 1/16 BEND 1 - CONC. BLOCK
3 STA. 0+40 1 - 3/4" ARV 1 - ARV VALVE BOX
4 STA. 1+54 F.H. CONNECTION 1 - 8" x 6" TEE 1 - 6" GATE VALVE, CL. 150 1 - VALVE BOX 1 - F.H. (HT. = 5'-0") 2 - CONC. BLOCKS 1 - CONC. SLAB 18 L.F. 6" PIPE 1 - F.H. REFLECTIVE MARKER (SEE F.H. PROFILE, SHT. 18)
5 STA. 2+52 1 - 8" 1/8 BEND (TV) 1 - CONC. BLOCK
6 STA. 2+54 1 - 8" 1/8 BEND (BV) 1 - CONC. BLOCK
7 STA. 2+60 1 - 8" 1/8 BEND (BV) 1 - CONC. BLOCK
8 STA. 2+82 1 - 8" 1/8 BEND (TV) 1 - CONC. BLOCK
9 STA. 4+10 F.H. CONNECTION 1 - 8" x 6" TEE 1 - 6" GATE VALVE, CL. 150 1 - VALVE BOX 1 - F.H. (HT. = 5'-6") 2 - CONC. BLOCKS 1 - CONC. SLAB 17 L.F. 6" PIPE 1 - F.H. REFLECTIVE MARKER (SEE F.H. PROFILE, SHT. 18)
10 STA. 4+50 1 - 3/4" ARV 1 - ARV VALVE BOX
11 STA. 4+73.5 1 - 8" 1/8 BEND (TV)
12 STA. 4+78 1 - 8" 1/8 BEND (BV)
13 STA. 4+85 1 - 8" 1/8 BEND (BV)
14 STA. 4+89.5 1 - 8" 1/8 BEND (TV)
15 17 LF REINF. CONC. JACKET
16 STA. 5+00 W.L. "D" = STA. 12+55.98 W.L. "A" (O/S 10.19' RT.)
TEMPORARY FOR TESTING 1 - 8" CAP WITH 2 1/2" C.O. 1 - CONC. BLOCK
CONNECT PHASE 7 TO PHASE 2 REMOVE 8" CAP AND CONC. BLOCK
MATERIALS FOR CONNECTION 1 - 8" SLEEVE 10 L.F. 8" PIPE (SEE CONNECTION SCHEMATIC SHT. 19)
PLAN - PRINCESS KAHANU AVENUE
SCALE: 1" = 20'
A DEMOLISH VALVE BOX, SALVAGE FRAME AND COVER
B SALVAGE EXISTING F.H. AND C.I. FRAME AND COVER, DEMOLISH VALVE BOX AND F.H. RISER. REMOVE EXISTING F.H. REFLECTIVE MARKER
C CUT AND PLUG WITH CONC. AFTER TRANSFER IS MADE
D DEMOLISH MANHOLE, SALVAGE FRAME AND COVER.
GRAPHIC SCALES:
20' 0 20' 40'
SCALE: 1" = 20'
4' 0 4' 8'
SCALE: 1" = 4'
BEGIN PHASE 7
END PHASE 7 END PHASE 2
STA. 0+00 W.L. "D" CONNECT TO EXISTING 8" WATER
0+40 NEW 3/4" ARV
TOP OF PIPE
EXISTING GROUND AT ℄ PIPE
INVERT NEW 8" WATER MAIN
3" MIN. COVER, (TYP.)
17 LF REINF. CONC. JACKET
4+50 NEW 3/4" ARV
STA. 5+00 W.L. "D" 8" GATE VALVE
END W.L. "D" STA. 5+10.19 = W.L. "A" STA. 12+55.98
1+54 F.H. CONNECTION
4+10 F.H. CONNECTION
1 - 8" x 6" TEE
1 - 8" 1/8 BEND (TV)
1 - CONC. BLOCK
1 - 8" 1/8 BEND (BV)
1 - CONC. BLOCK
DEFLECT 8.25
DEFLECT 8.56
DEFLECT 14.70
DEFLECT 9.08
DEFLECT 9.00
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 4'
0+00 1+00 2+00 3+00 4+00
02-031A
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII
PLAN AND PROFILE W.L. "D"
STA. 0+00 TO END
LESTER M. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 4958-C HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
APPROVED: WATER MAINTENANCE SUPERVISOR
DATE: 9/5/02



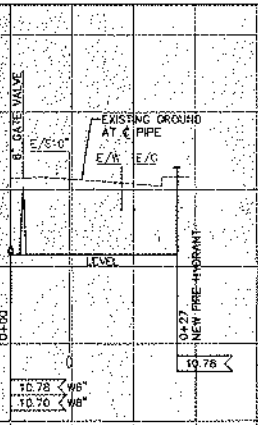
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 10+66 WL "A"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



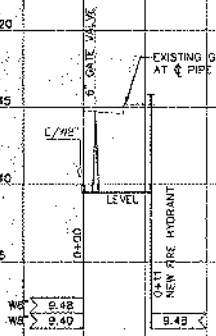
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 14+43 WL "A"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



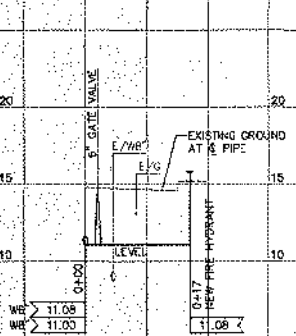
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 16+67 WL "A"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



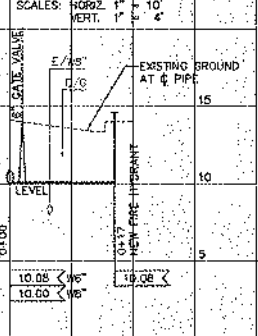
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 19+32 WL "A"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



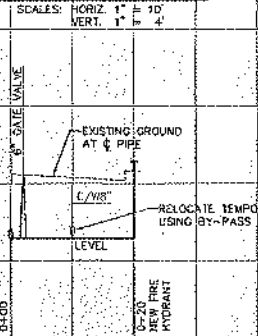
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 21+31 WL "A"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



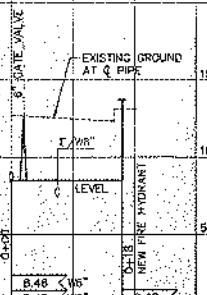
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 1+02 WL "B"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



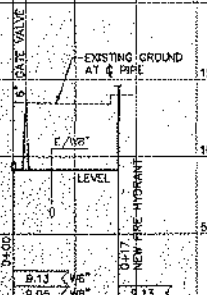
PROFILE – FIRE HYDRANT CONNECTION
AT STA. 3+48 WL "B"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



PROFILE – FIRE HYDRANT CONNECTION
AT STA. 0+87 WL "C"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



PROFILE – FIRE HYDRANT CONNECTION
AT STA. 1+54 WL "D"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'



PROFILE – FIRE HYDRANT CONNECTION
AT STA. 4+10 WL "D"
SCALES: HORIZ. 1" = 10'
VERT. 1" = 4'

GRAPHIC SCALES:
10' 0 0' 20'
SCALE: 1" = 10'
4' 0 4' 8'
SCALE: 1" = 4'

LESTER H. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 4008-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Howard K. Takaki, MANAGER, MAINTENANCE DIVISION DATE: 9/5/02

DRAWN BY: FM | ENGINEER: KBY | CHECKED BY: LHF | FILE NO.

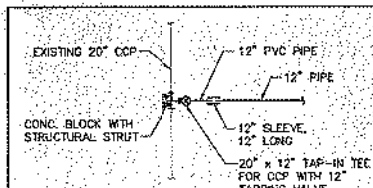
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 18 OF 31 SHEETS

02-031A

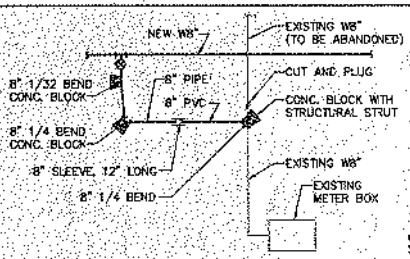
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
WAHIAWA, OAHU, HAWAII

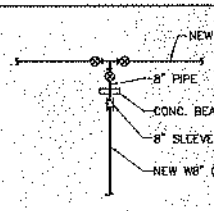
FIRE HYDRANT LATERAL PROFILES



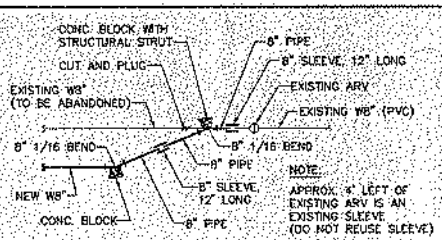
CONNECTION SCHEMATIC
STA. 0+00 WL "A"
NOT TO SCALE



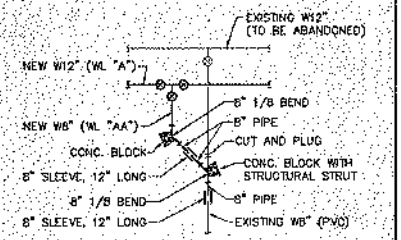
CONNECTION SCHEMATIC
STA. 2+58 WL "A"
NOT TO SCALE



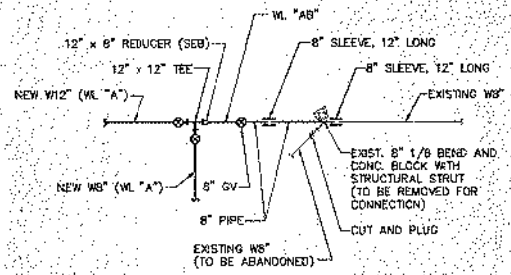
CONNECTION SCHEMATIC
STA. 12+55.98 O/S 10.19' RT. WL "A"
= STA. 5+00 WL "D"
NOT TO SCALE



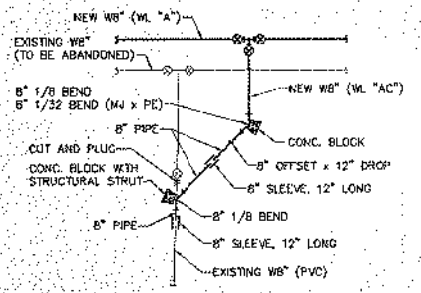
CONNECTION SCHEMATIC
STA. 26+17.98 WL "A"
NOT TO SCALE



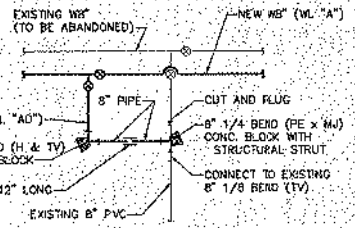
CONNECTION SCHEMATIC
STA. 0+20 WL "AA"
NOT TO SCALE



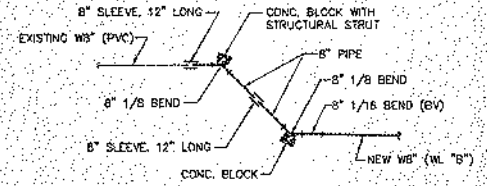
CONNECTION SCHEMATIC
STA. 0+18 WL "AB"
NOT TO SCALE



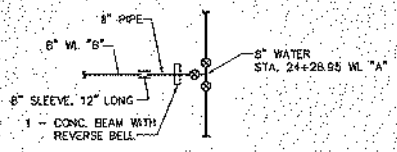
CONNECTION SCHEMATIC
STA. 0+30 WL "AC"
NOT TO SCALE



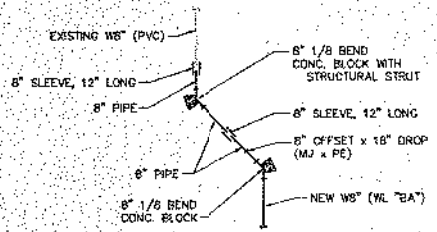
CONNECTION SCHEMATIC
STA. 0+26.77 WL "AD"
NOT TO SCALE



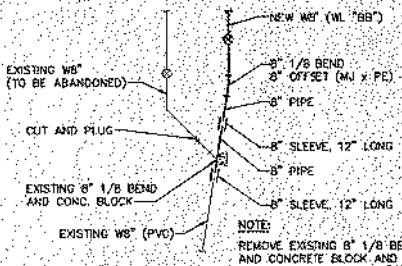
CONNECTION SCHEMATIC
STA. (-)0+21.14 WL "B"
NOT TO SCALE



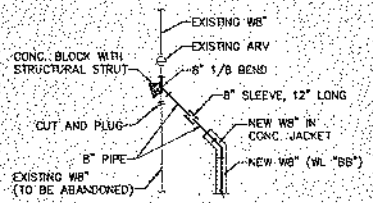
CONNECTION SCHEMATIC
STA. 4+13.86 WL "B"
= STA. 24+28.95 WL "A" (O/S 10' LT.)
NOT TO SCALE



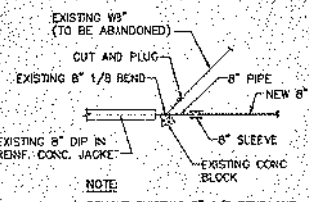
CONNECTION SCHEMATIC
STA. 0+25 WL "BA"
NOT TO SCALE



CONNECTION SCHEMATIC
STA. (-)0+26.11 WL "BB"
NOT TO SCALE

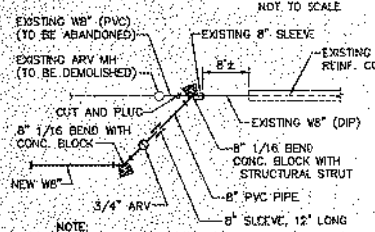


CONNECTION SCHEMATIC
STA. 0+44 WL "BB"
NOT TO SCALE



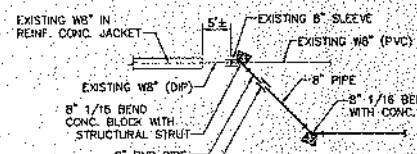
NOTE:
REMOVE EXISTING 8" 1/8 BEND AND BLOCK AND CONNECT TO END OF JACKET (1V BEND).

CONNECTION SCHEMATIC
STA. 0+00 WL "C"
NOT TO SCALE



NOTE:
REMOVE EXISTING 8" SLEEVE AND CONNECT TO EXISTING 8" DIP STUB-OUT FROM CONC. JACKET.

CONNECTION SCHEMATIC
STA. 2+18.04 WL "C"
NOT TO SCALE



NOTE:
REMOVE EXISTING 8" SLEEVE AND CONNECT TO EXISTING 8" DIP STUB-OUT FROM CONCRETE JACKET.

CONNECTION SCHEMATIC
STA. 0+00 WL "D"
NOT TO SCALE

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII
CONNECTION SCHEMATICS

LESTER H. FURUYA LICENSED PROFESSIONAL ENGINEER No. 4904-E HAWAII, U.S.A.

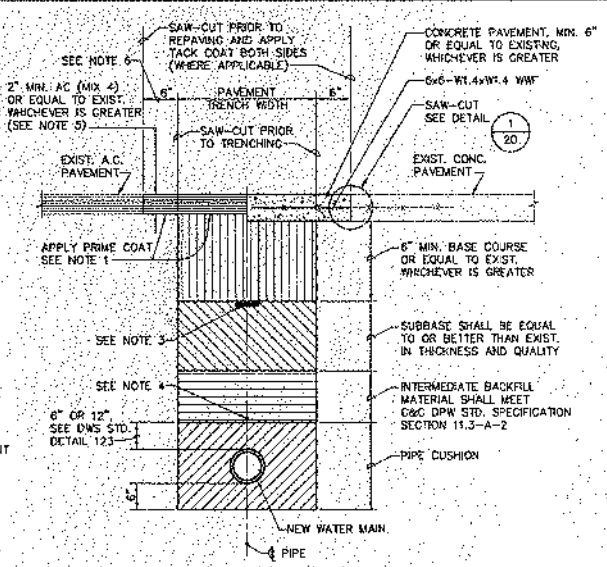
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Manager and Chief Engineer
DATE: 9/6/02

DESIGNED BY: CDK | ENGINEER IN CH: | CHECKED BY: LHF | TITLE NO.
FIELD BOOK NO.: | SCALE: AS NOTED | SHEET 19 OF 31 SHEETS

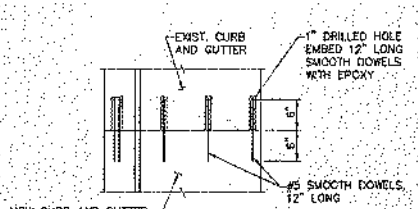
NOTES:

1. FOR ROAD GRADES FROM 0% TO 7.99% AND PRIME COAT IS NOT AVAILABLE, NONE REQUIRED. IF AVAILABLE, USE IT.
2. PAVEMENT STRUCTURE SHALL BE EQUAL TO OR BETTER THAN EXISTING IN THICKNESS AND QUALITY EXCEPT AS OTHERWISE NOTED.
3. INSTALL 4 MIL THICK, NON-METALLIC, BLUE COLORED, 6" WIDE WARNING TAPE OVER CENTERLINE OF THE PIPE AND BELOW THE BASE COURSE ALONG THE ENTIRE LENGTH OF TRENCH. TAPE SHOULD BE MARKED WITH "CAUTION WATER LINE BURIED BELOW". PAYMENT FOR THE FURNISHING AND INSTALLATION OF THE WARNING TAPE SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE PIPE.
4. INSTALL NO. 8 GA COPPER TONING WIRE OVER CENTERLINE OF PVC PIPES AT 2'-6" MAXIMUM FROM FINISH GRADE.
5. MIN. THICKNESS FOR PRINCESS KAHANU AVENUE IS 3".
6. REMOVE AND RECONSTRUCT A.C. PAVEMENT FROM EDGE OF TRENCH TO EDGE OF CONCRETE GUTTER IF LESS THAN 2'-0" FROM EDGE OF TRENCH.

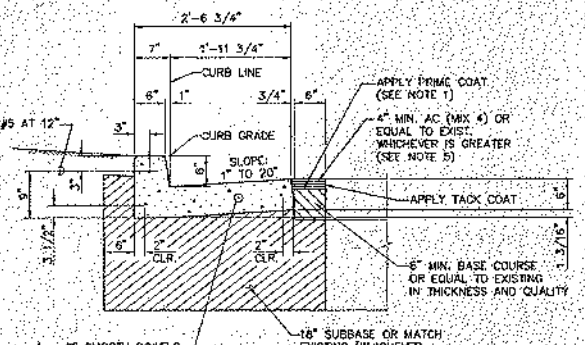


TYPICAL TRENCH RESTORATION DETAIL – A.C. AND CONCRETE PAVEMENTS

NOT TO SCALE

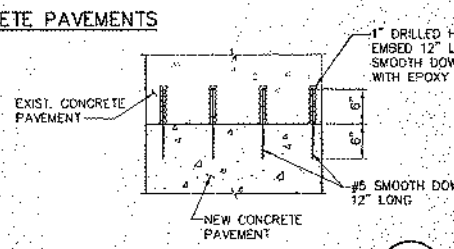


PLAN



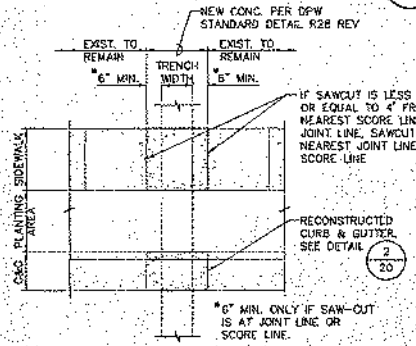
RESTORATION OF INTEGRAL CURB AND GUTTER 2/20

NOT TO SCALE



CONCRETE PAVEMENT DOWEL 1/20

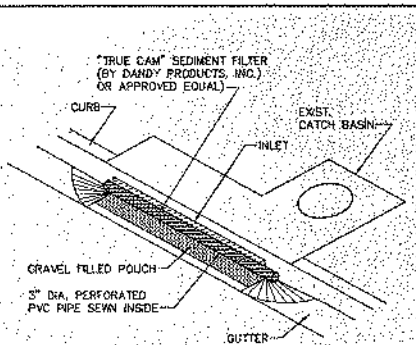
NOT TO SCALE



SIDEWALK RECONSTRUCTION DETAIL PLAN

TYPICAL CONCRETE RESTORATION DETAIL

NOT TO SCALE

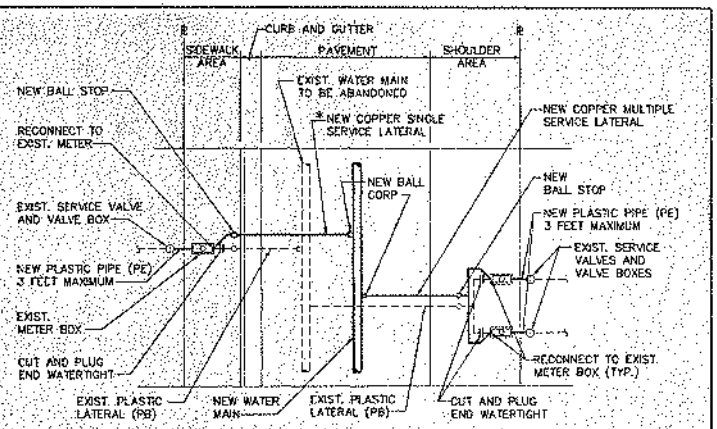


NOTE:

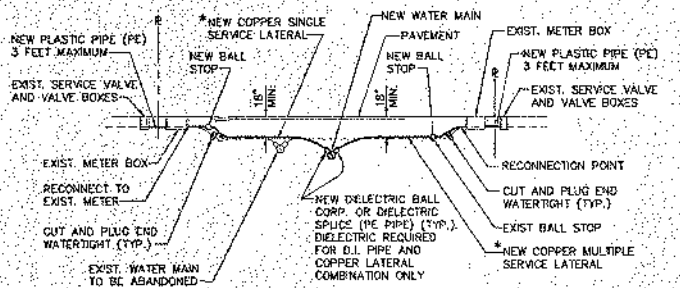
CONTRACTOR SHALL INSTALL SEDIMENT CONTROL FILTER DEVICES AT INLETS TO STREET CATCH BASINS TO PREVENT SOIL OR DEBRIS IN ANY FORM, FROM ENTERING INTO THE CITY DRAINAGE SYSTEM. COST FOR THIS ITEM OF WORK SHALL BE INCIDENTAL TO TRENCH EXCAVATION.

SEDIMENT CONTROL FILTER AT CATCH BASIN

NOT TO SCALE



PLAN



SINGLE SERVICE LATERAL — MULTIPLE SERVICE LATERAL

PROFILE

NOTES:

1. EXISTING PLASTIC LATERAL IS POLYBUTYLENE (PB).
2. DO NOT RECONNECT TO POLYBUTYLENE (PB) LATERALS.
3. FOR 2 1/2 INCH LATERAL CONNECTIONS, INSTALL 2-INCH BALL CORP WITH 2" x 2 1/2" ADAPTERS.
4. INSTALL ELBOWS AND PIPE EXTENSIONS BEFORE METERS TO PROVIDE 18-INCH MINIMUM COVER FOR SERVICE LATERALS.

* FOR CLEARANCE BETWEEN SERVICE LATERAL AND CURB AND GUTTER, SEE BWS STANDARD DETAIL 91 (FOR COPPER SERVICE LATERAL).

NEW COPPER SERVICE LATERAL RECONNECTION DETAIL

NOT TO SCALE

02-031A

LESTER M. FUKUMA LICENSED PROFESSIONAL ENGINEER No. 6800-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

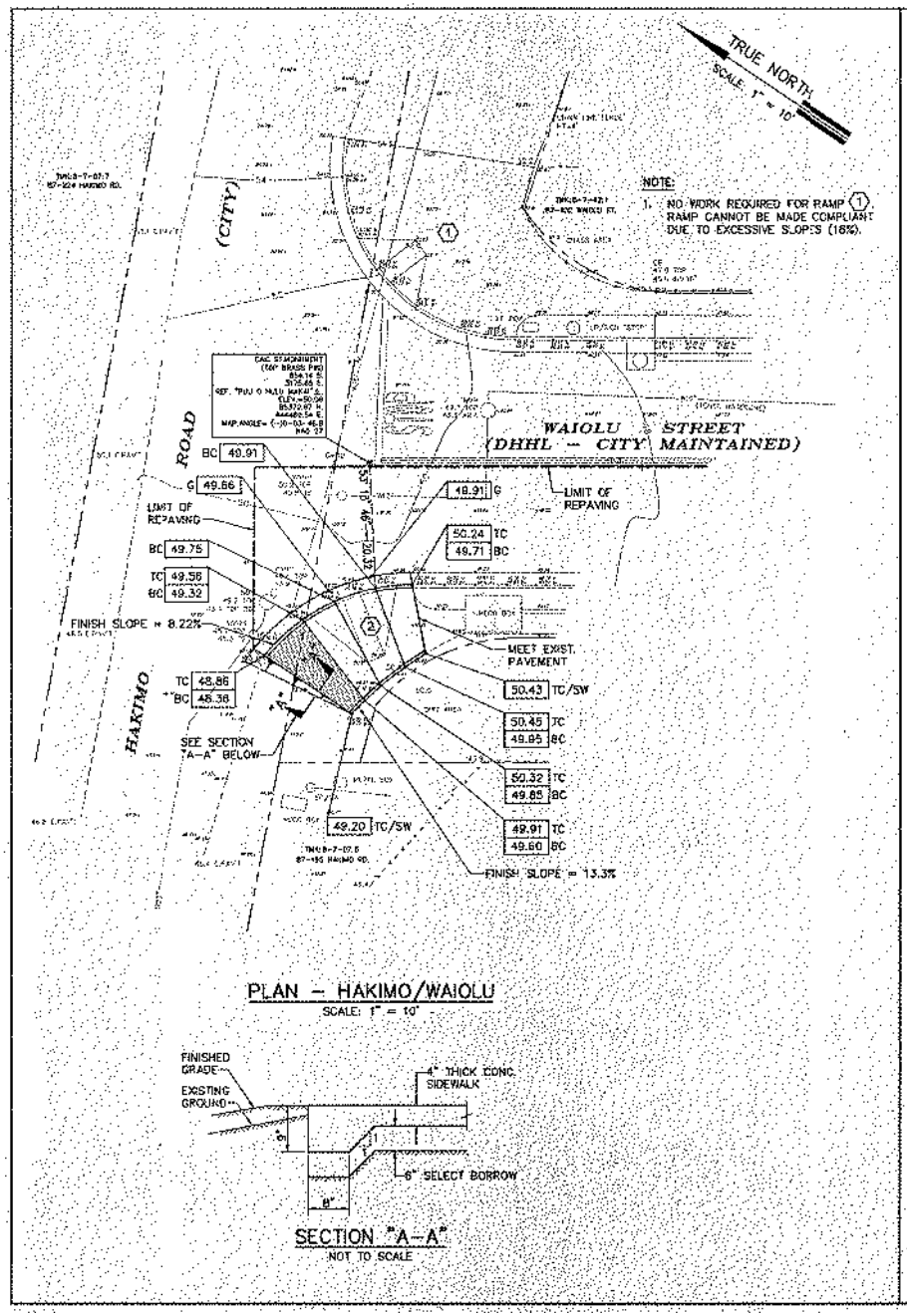
MISCELLANEOUS DETAILS

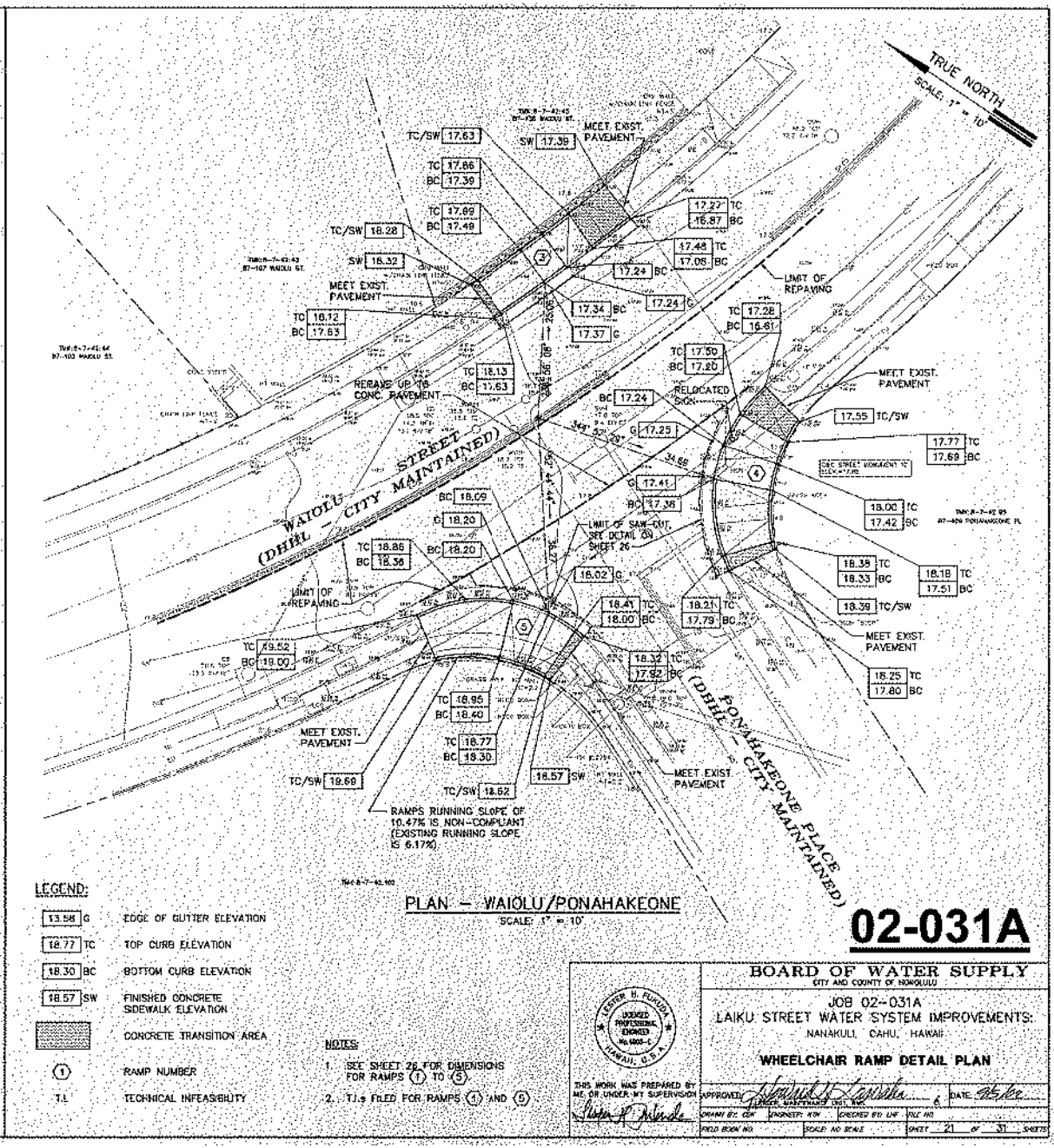
APPROVED: Leonard K. Fuji, MANAGER AND CHIEF ENGINEER — DATE: 9/6/02

DRAWN BY: TM | ENGINEER: KM | CHECKED BY: LMF | FILE NO.

FIELD BOOK NO. | SCALE: AS NOTED | SHEET 20 OF 31 SHEETS

REVISED: 08/22/02





02-031A

LICENSED PROFESSIONAL ENGINEER LESTER H. FUKUDA No. 6805-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME, OR UNDER MY SUPERVISION

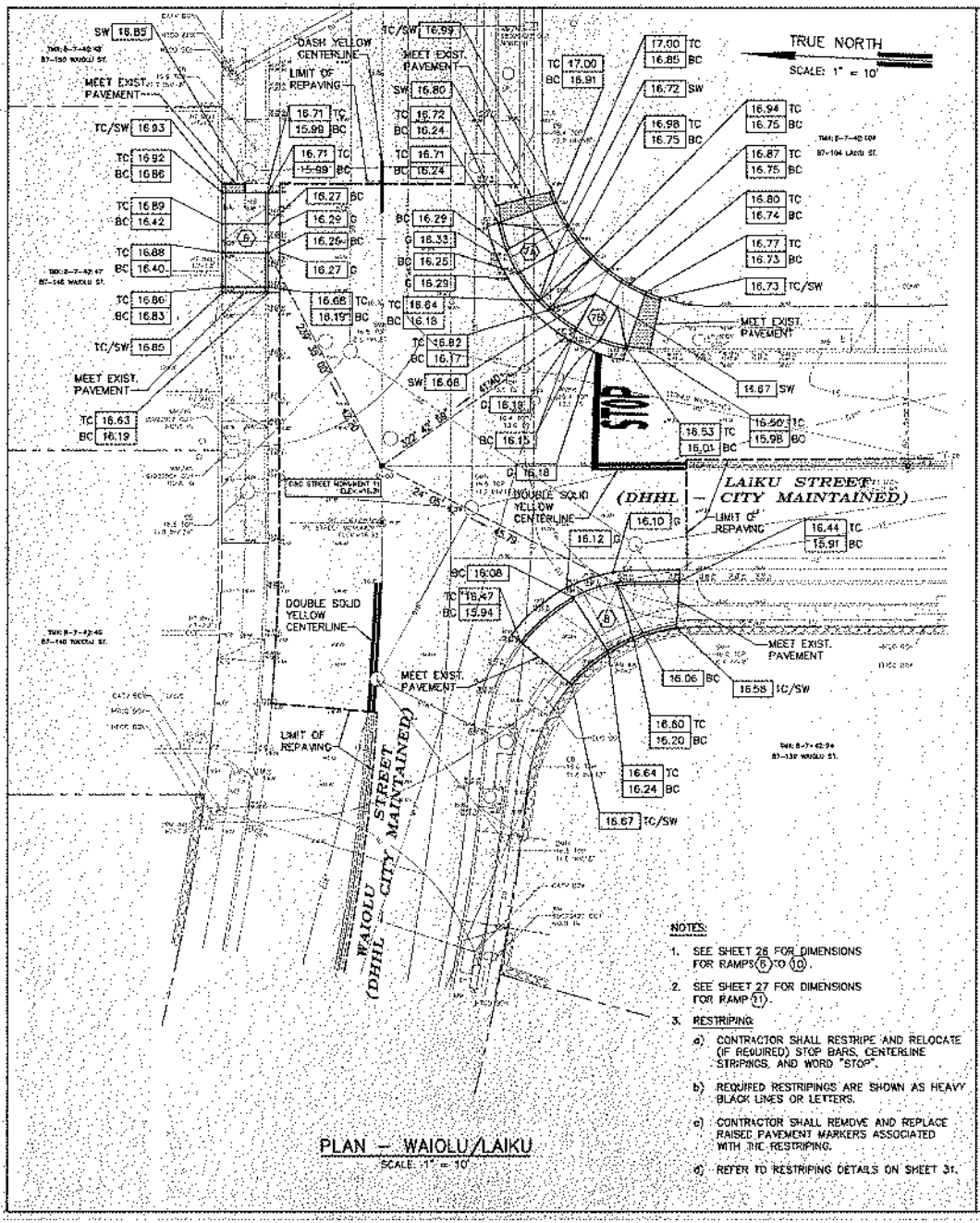
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

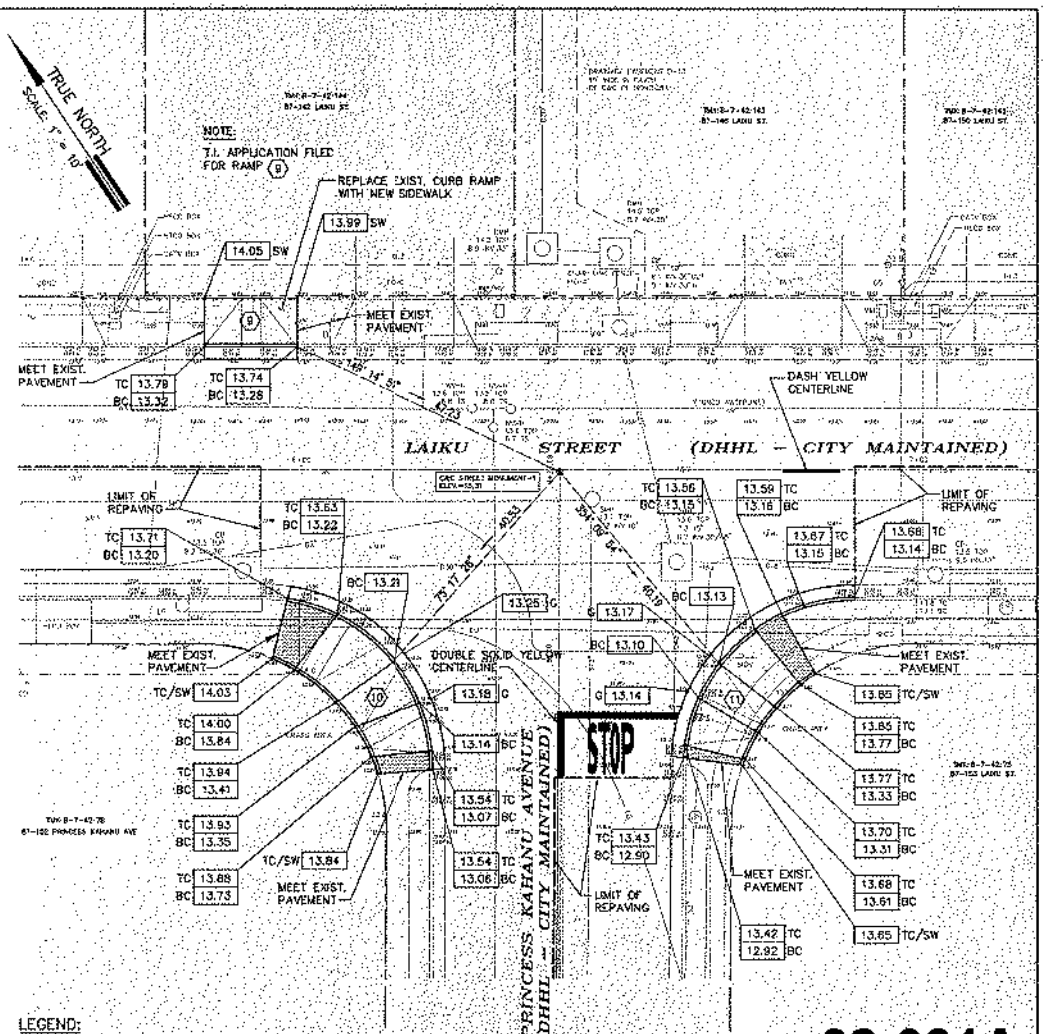
WHEELCHAIR RAMP DETAIL PLAN

APPROVED: [signature] MANAGER AND CHIEF ENGINEER DATE: 8/6/02

DRAWN BY: CDK	ENGINEER: KYM	DESIGNED BY: LHF	JOB NO.
FIELD BOOK NO.	SCALE: NO SCALE	SHEET 21 OF 31 SHEETS	



PLAN — WAIOLU/LAIKU
SCALE: 1" = 10'



PLAN — LAIKU/PRINCESS KAHANU
SCALE: 1" = 10'

NOTES:

1. SEE SHEET 28 FOR DIMENSIONS FOR RAMPS (6) TO (10).
2. SEE SHEET 27 FOR DIMENSIONS FOR RAMP (11).
3. RESTRIPING:
   a) CONTRACTOR SHALL RESTRIPE AND RELOCATE (IF REQUIRED) STOP BARS, CENTERLINE STRIPINGS, AND WORD "STOP".
   b) REQUIRED RESTRIPINGS ARE SHOWN AS HEAVY BLACK LINES OR LETTERS.
   c) CONTRACTOR SHALL REMOVE AND REPLACE RAISED PAVEMENT MARKERS ASSOCIATED WITH THE RESTRIPING.
   d) REFER TO RESTRIPING DETAILS ON SHEET 31.

LEGEND:

13.28 G	EDGE OF GUTTER ELEVATION
13.98 TC	TOP CURB ELEVATION
13.82 BC	BOTTOM CURB ELEVATION
13.66 SW	FINISHED CONCRETE SIDEWALK ELEVATION
	CONCRETE TRANSITION AREA
(6)	RAMP NUMBER
T.I.	TECHNICAL INFEASIBILITY

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

WHEELCHAIR RAMP DETAIL PLAN

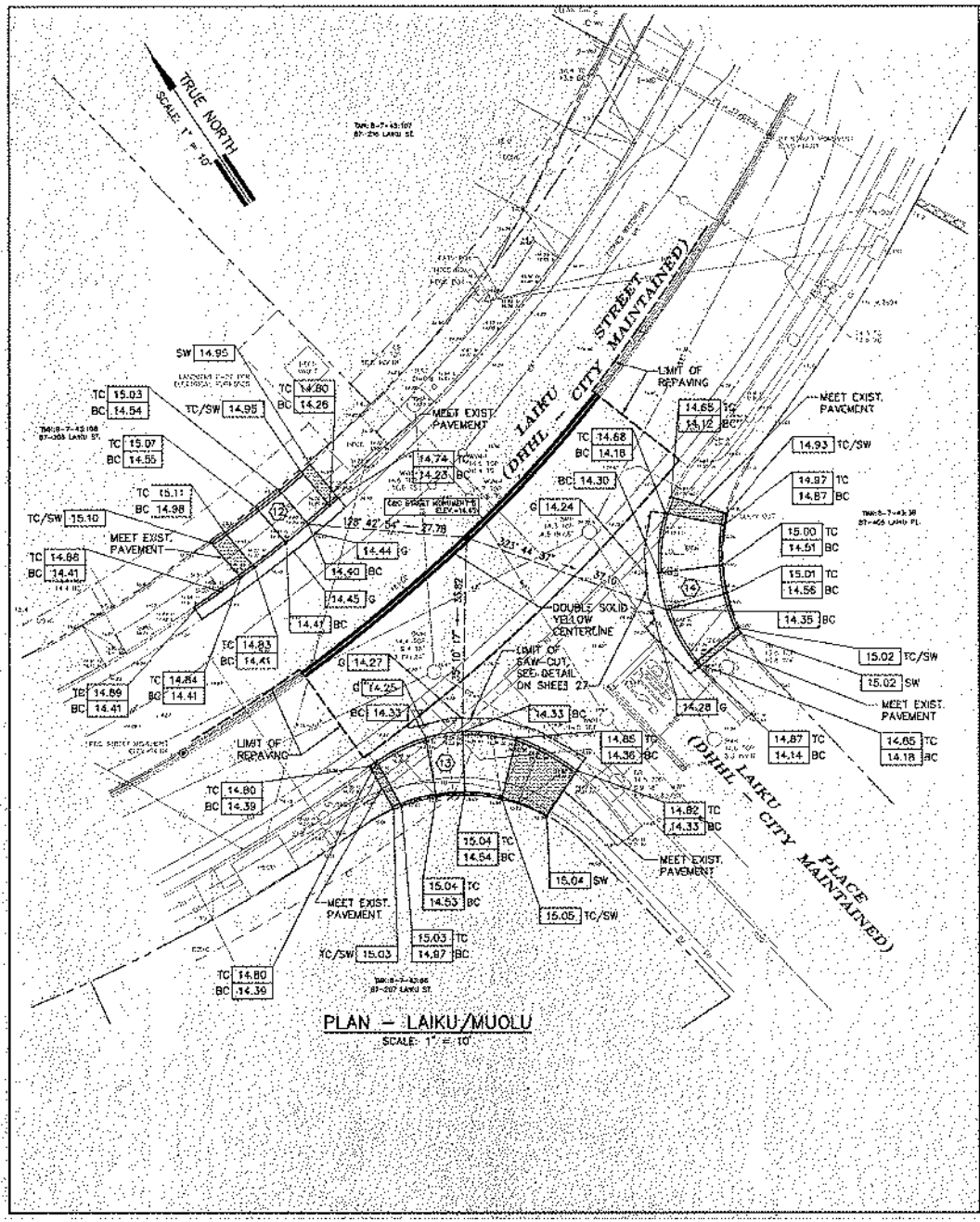
LESTER H. TUNION — LICENSED PROFESSIONAL ENGINEER — No. 9308-E — HAWAII, U.S.A.

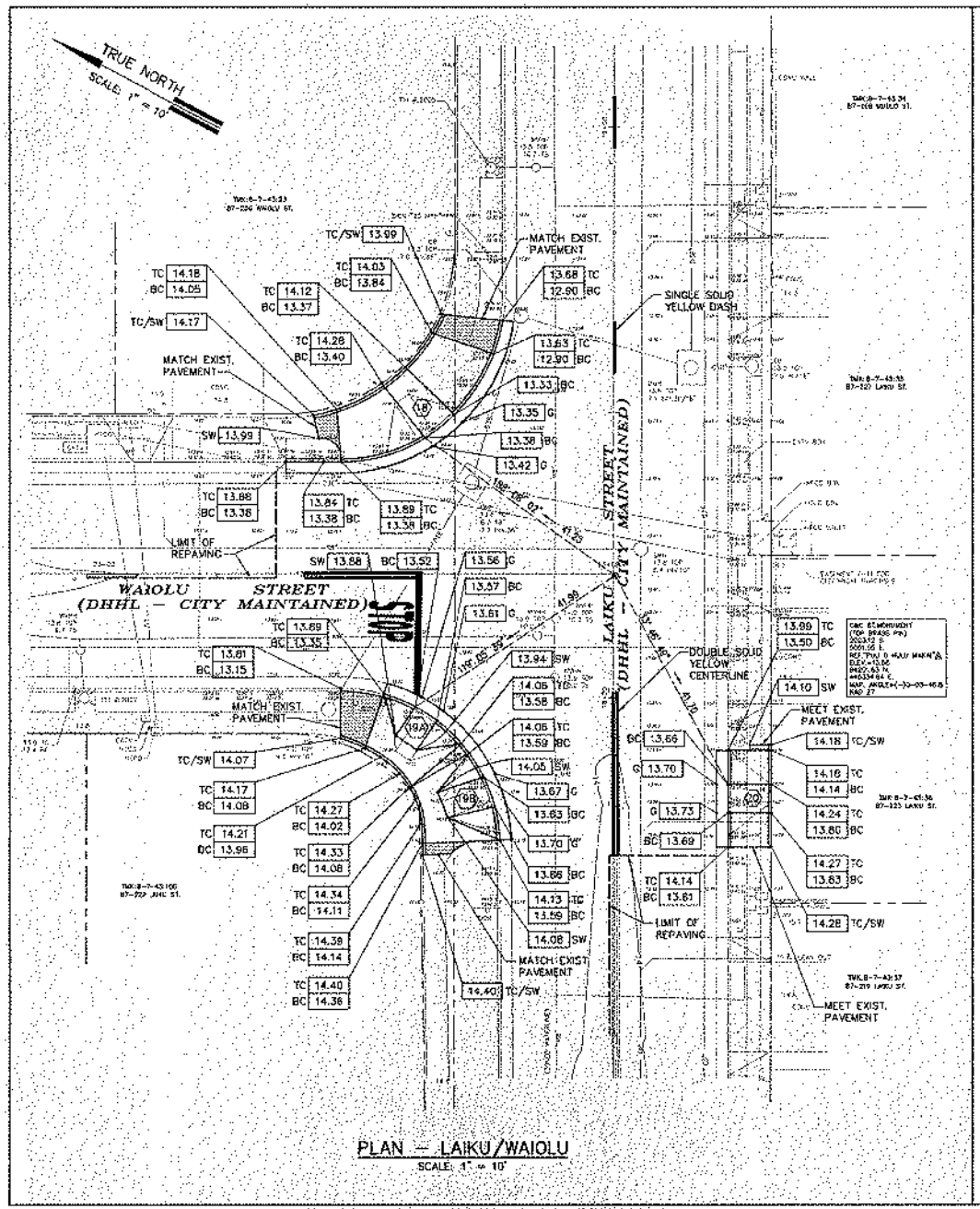
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED: Manager and Chief Engineer, Water Maintenance Unit, BWS — DATE: 9/5/02

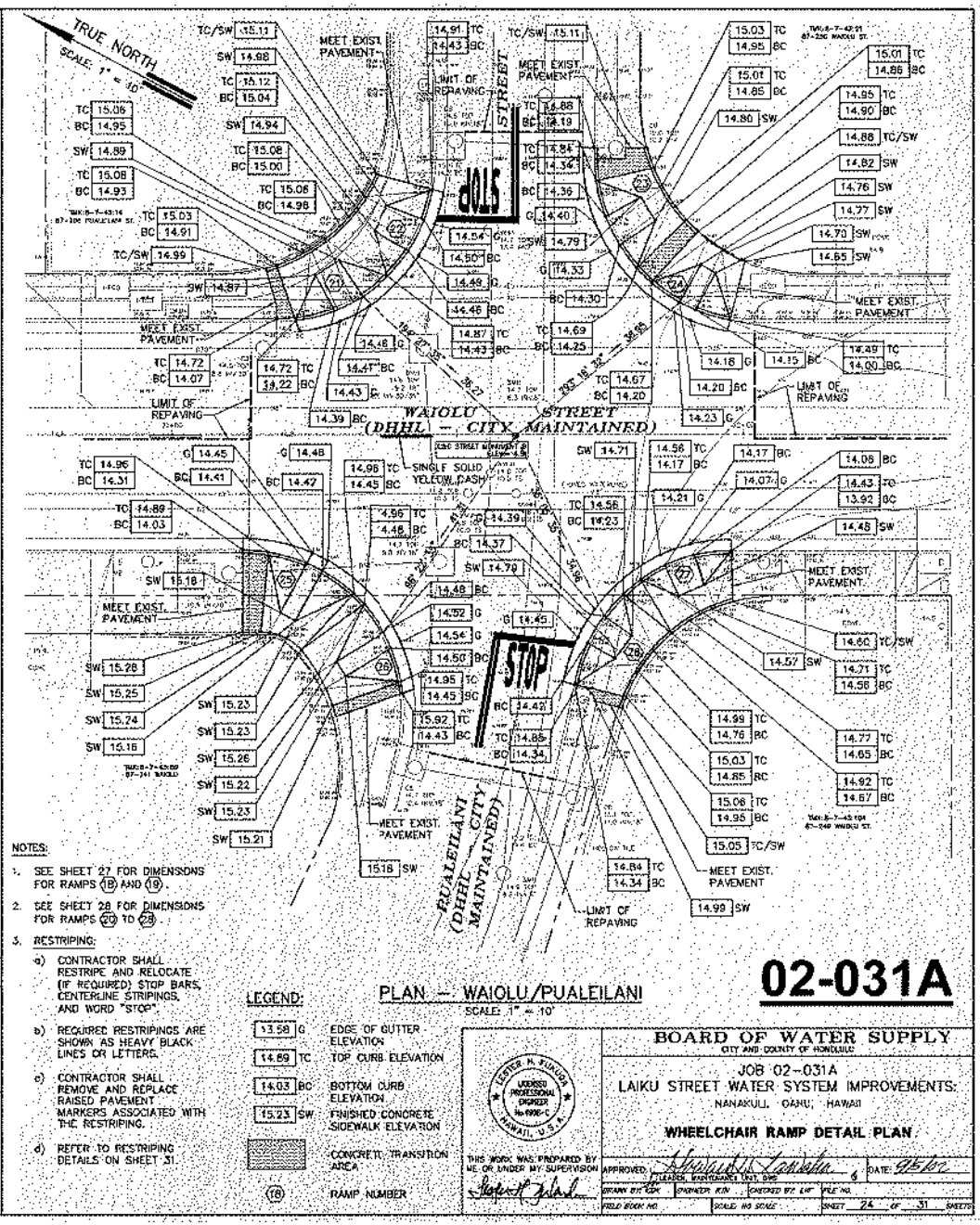
DRAWN BY: CDW | ENGINEER: KIN | CHECKED BY: CHF | TRC NO.

FIELD BOOK NO. | SCALE: NO SCALE | SHEET 22 OF 31 SHEETS


TRUE NORTH
SCALE: 1" = 10'
LAIKU CITY STREET MAINTAINED
(DHHL – CITY MAINTAINED)
LIMIT OF REPAVING
MEET EXIST. PAVEMENT
DOUBLE SOLID YELLOW CENTERLINE
LIMIT OF SAW-CUT, SEE DETAIL ON SHEET 27
MEET EXIST. PAVEMENT
LAIKU PLACE MAINTAINED
(DHHL – CITY MAINTAINED)
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT
LIMIT OF REPAVING
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT



PLAN – LAIKU/WAIOLU
SCALE: 1" = 10'



PLAN – WAIOLU/PUALEILANI
SCALE: 1" = 10'

NOTES:

1. SEE SHEET 27 FOR DIMENSIONS FOR RAMPS (18) AND (19).
2. SEE SHEET 28 FOR DIMENSIONS FOR RAMPS (20) TO (28).
3. RESTRIPING:
   a) CONTRACTOR SHALL RESTRIPE AND RELOCATE (IF REQUIRED) STOP BARS, CENTERLINE STRIPINGS, AND WORD "STOP".
   b) REQUIRED RESTRIPINGS ARE SHOWN AS HEAVY BLACK LINES OR LETTERS.
   c) CONTRACTOR SHALL REMOVE AND REPLACE RAISED PAVEMENT MARKERS ASSOCIATED WITH THE RESTRIPING.
   d) REFER TO RESTRIPING DETAILS ON SHEET 31.

LEGEND:

13.58	G	EDGE OF GUTTER ELEVATION
14.69	TC	TOP CURB ELEVATION
14.03	BC	BOTTOM CURB ELEVATION
15.23	SW	FINISHED CONCRETE SIDEWALK ELEVATION
		CONCRETE TRANSITION AREA
(18)		RAMP NUMBER

LESTER H. TUNON
LICENSED PROFESSIONAL ENGINEER
No. 9906-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

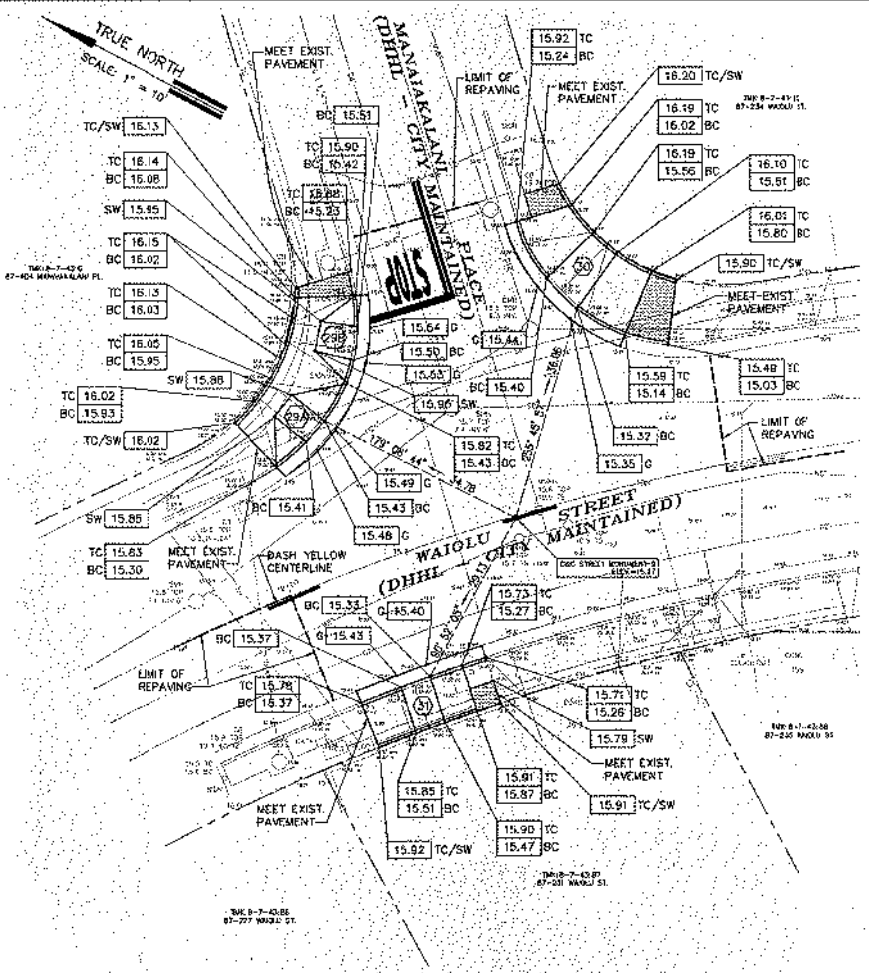
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

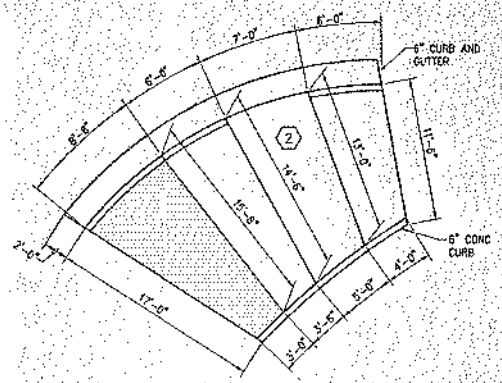
WHEELCHAIR RAMP DETAIL PLAN

APPROVED: _____ DATE: 9/5/02
LEADER, MAINTENANCE UNIT, DWS

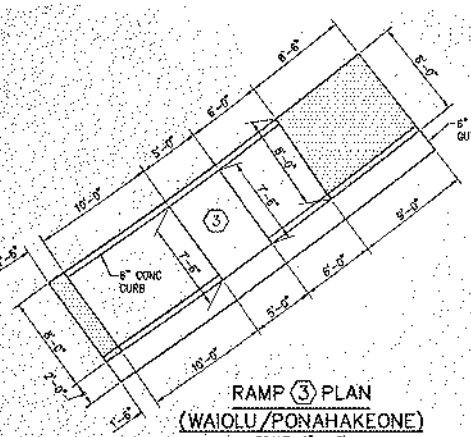
DRAWN BY: KOH | CHECKED BY: LHP | FILE NO.
FIELD BOOK NO. | SCALE: NO SCALE | SHEET 24 OF 31 SHEETS

02-031A

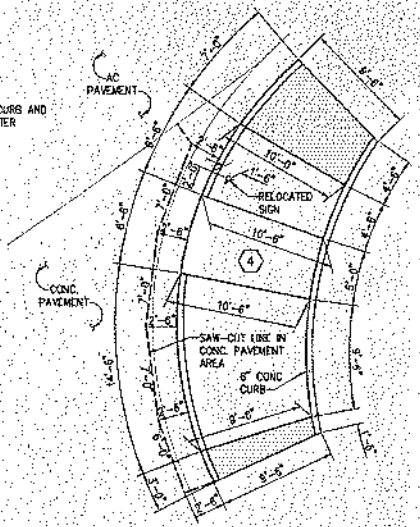

TRUE NORTH
SCALE: 1" = 10'
MEET EXIST. PAVEMENT
LIMIT OF REPAVING
MANAIAKALANI STREET (DHHL - CITY MAINTAINED)
PLACE
STOP
WAIOLU STREET (DHHL - CITY MAINTAINED)
DASH YELLOW CENTERLINE
MEET EXIST. PAVEMENT
LIMIT OF REPAVING
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT
LIMIT OF REPAVING
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT
MEET EXIST. PAVEMENT



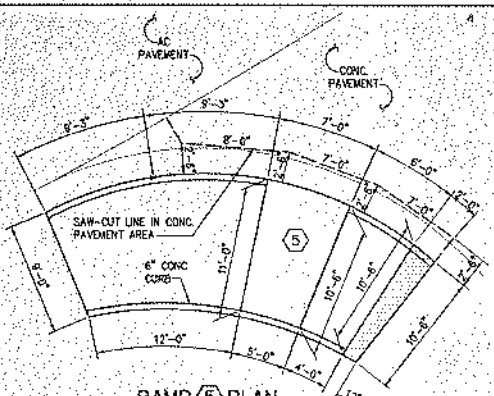
RAMP (2) PLAN
(HAKIMO/WAIOLU)
SCALE: 1" = 5'



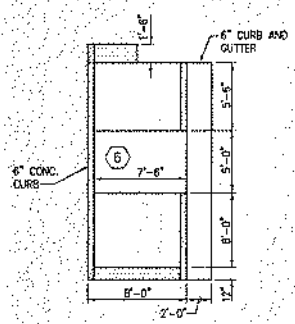
RAMP (3) PLAN
(WAIOLU/PONAHAKEONE)
SCALE: 1" = 5'



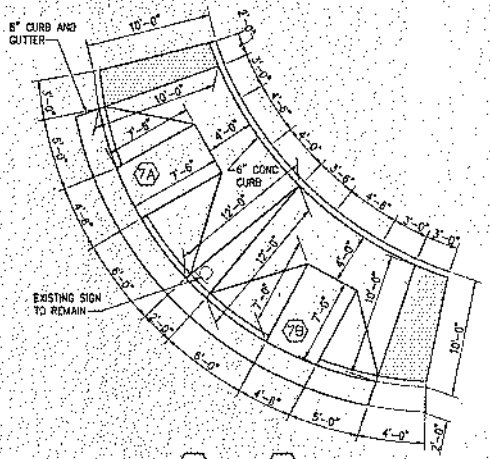
RAMP (4) PLAN
(WAIOLU/PONAHAKEONE)
SCALE: 1" = 5'



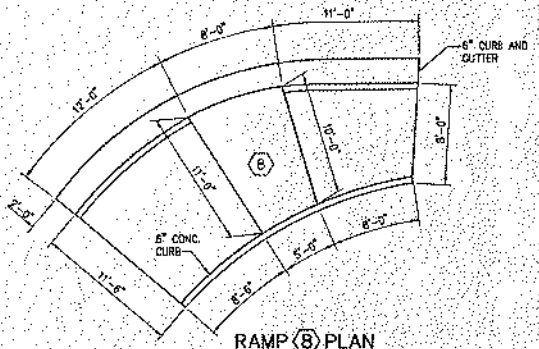
RAMP (5) PLAN
(WAIOLU/PONAHAKEONE)
SCALE: 1" = 5'



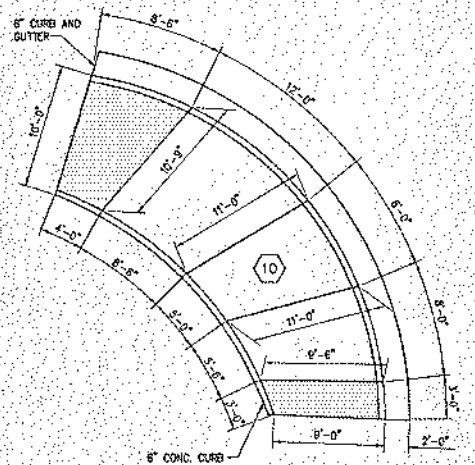
RAMP (6) PLAN
(WAIOLU/LAIKU)
SCALE: 1" = 5'



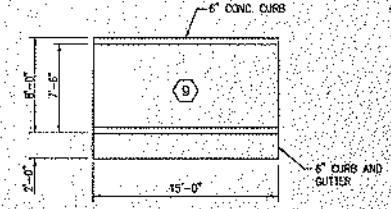
RAMPS (7A) AND (7B) PLAN
(WAIOLU/LAIKU)
SCALE: 1" = 5'



RAMP (8) PLAN
(WAIOLU/LAIKU)
SCALE: 1" = 5'



RAMP (10) PLAN
(LAIKU/PRINCESS KAHANU)
SCALE: 1" = 5'



RAMP (9) PLAN
(LAIKU/PRINCESS KAHANU)
SCALE: 1" = 5'

02-031A

GRAPHIC SCALE:
5 0 5 10
SCALE: 1" = 5'

LESTER M. FURUYA
LICENSED PROFESSIONAL ENGINEER
No. 8400-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

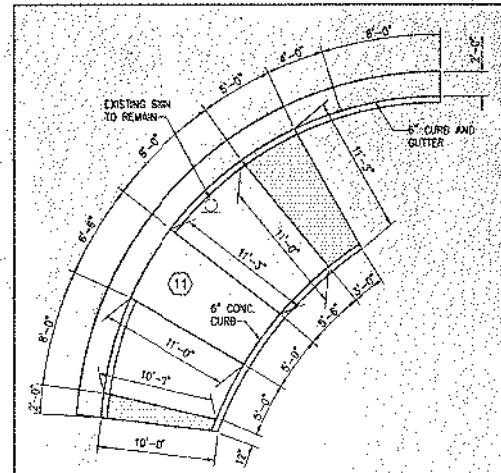
JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

WHEELCHAIR RAMP DETAILS - DIMENSIONS

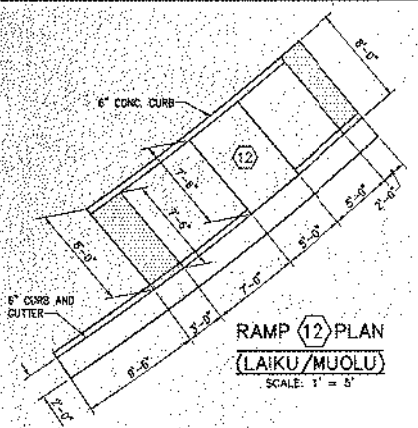
APPROVED: for LEONARD K. FUKUNAGA, MANAGER AND CHIEF ENGINEER — DATE: 7/15/02

DRAWN BY: YM | ENGINEER: KTF | CHECKED BY: LKF | FILE NO.

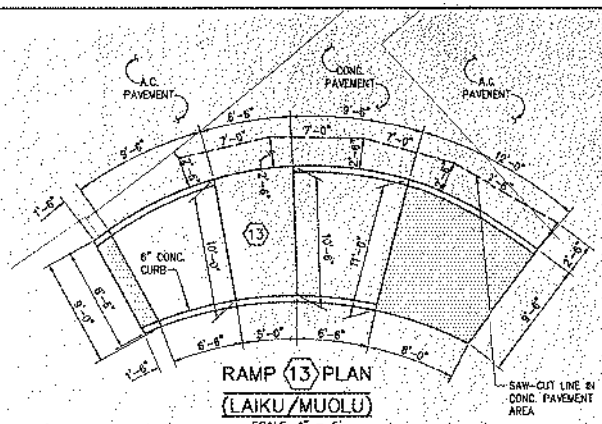
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 26 OF 31 SHEETS



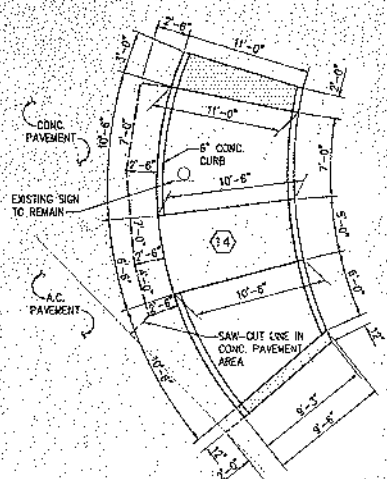
RAMP (11) PLAN
(LAIKU/PRINCESS KAHANU)
SCALE: 1" = 5'



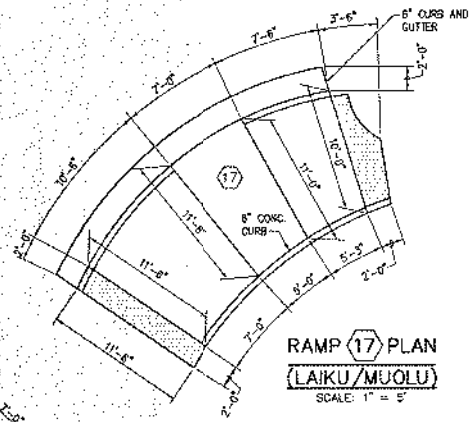
RAMP (12) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



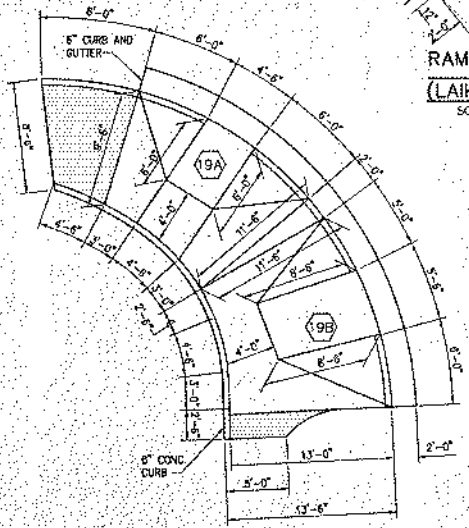
RAMP (13) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



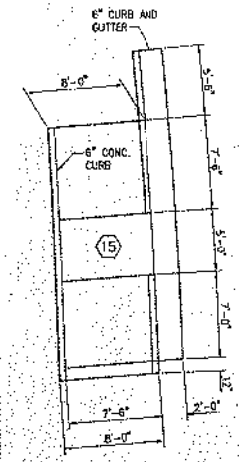
RAMP (14) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



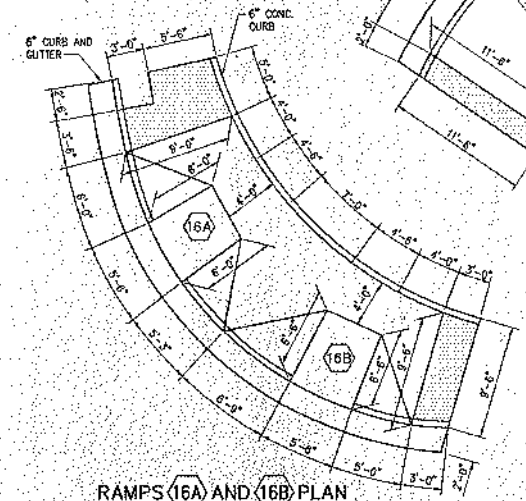
RAMP (17) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



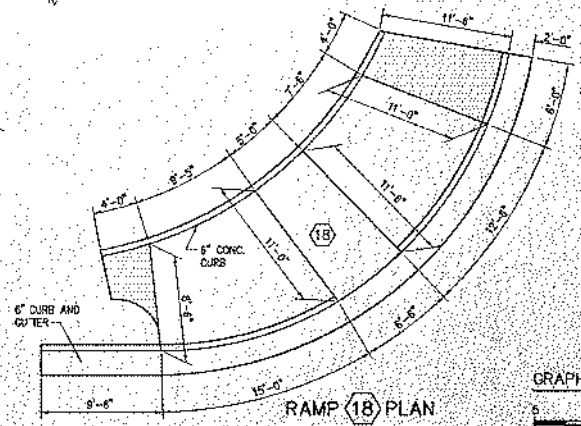
RAMPS (19A) AND (19B) PLAN
(LAIKU/WAIOLU)
SCALE: 1" = 5'



RAMP (15) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



RAMPS (16A) AND (16B) PLAN
(LAIKU/MUOLU)
SCALE: 1" = 5'



RAMP (18) PLAN
(LAIKU/WAIOLU)
SCALE: 1" = 5'

GRAPHIC SCALE:
5 0 5 10
SCALE: 1" = 5'

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

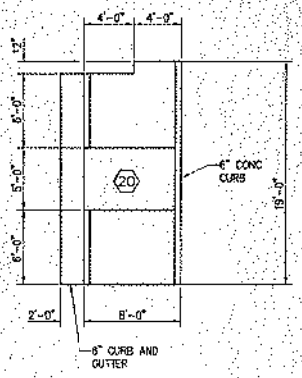
WHEELCHAIR RAMP DETAILS - DIMENSIONS

LESTER M. FUKUDA
LICENSED PROFESSIONAL ENGINEER
No. 4509-C
HAWAII, U.S.A.

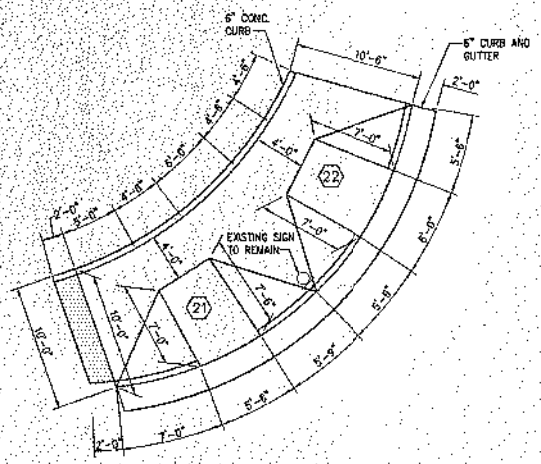
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APPROVED: [signature] MAINTENANCE UNIT, BWS
DATE: 9/5/02

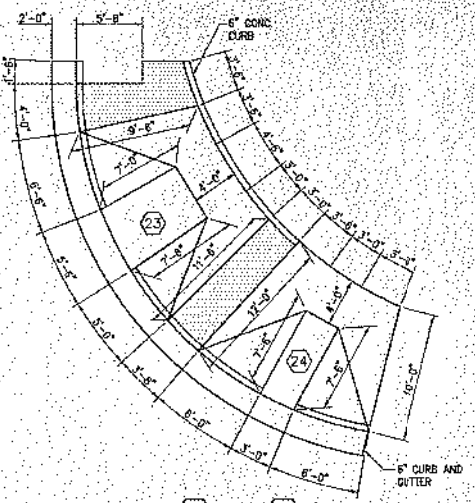
DRAWN BY: KAI | CHECKED BY: LEE | FILE NO.
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 27 OF 31 SHEETS



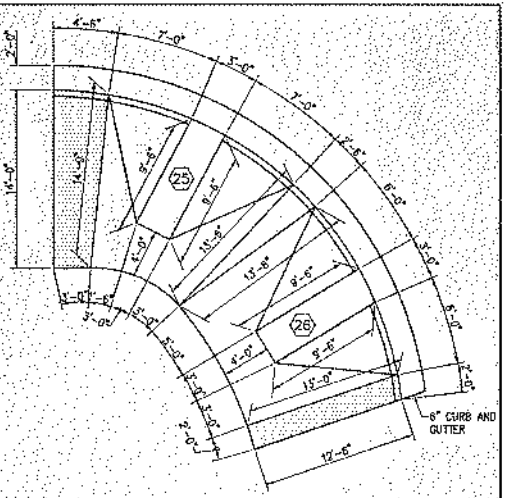
RAMP (20) PLAN
(LAIKU/WAIOLU)
SCALE: 1" = 5'



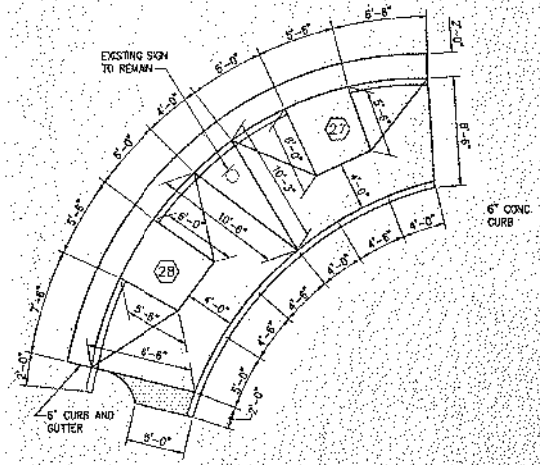
RAMPS (21) AND (22) PLAN
(WAIOLU/PUALEILANI)
SCALE: 1" = 5'



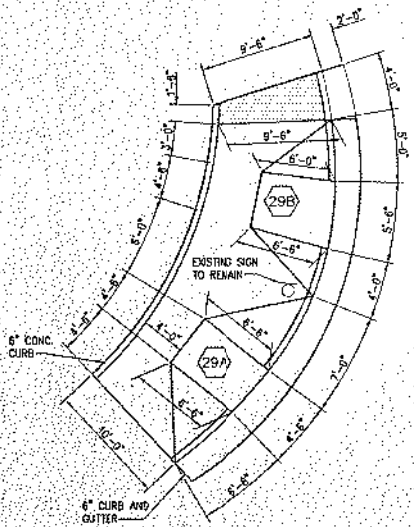
RAMPS (23) AND (24) PLAN
(WAIOLU/PUALEILANI)
SCALE: 1" = 5'



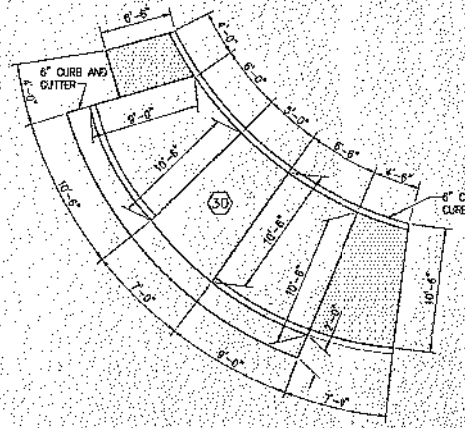
RAMPS (25) AND (26) PLAN
(WAIOLU/PUALEILANI)
SCALE: 1" = 5'



RAMPS (27) AND (28) PLAN
(WAIOLU/PUALEILANI)
SCALE: 1" = 5'

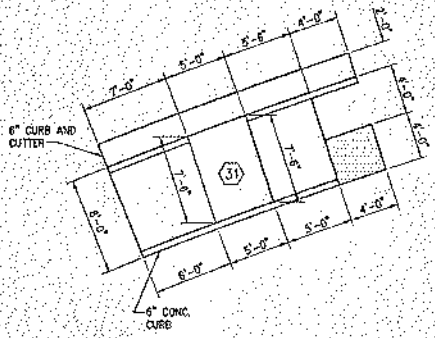


RAMPS (29A) AND (29B) PLAN
(WAIOLU/MANAIAKALANI)
SCALE: 1" = 5'



RAMP (30) PLAN
(WAIOLU/MANAIAKALANI)
SCALE: 1" = 5'

GRAPHIC SCALE:
5 0 5 10
SCALE: 1" = 5'



RAMP (31) PLAN
(WAIOLU/MANAIAKALANI)
SCALE: 1" = 5'

02-031A

LESTER M. FUKUDA
LICENSED PROFESSIONAL ENGINEER
No. 4895-C
HAWAII, U.S.A.

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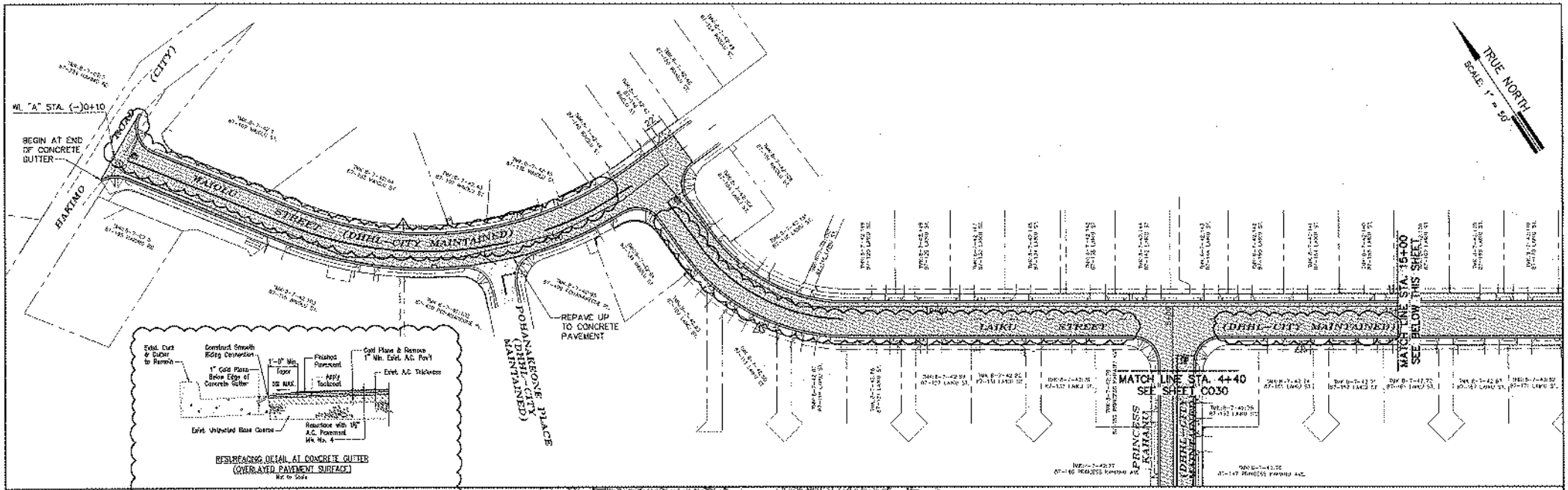
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
NANAKULI, OAHU, HAWAII

WHEELCHAIR RAMP DETAILS - DIMENSIONS

APPROVED: Leonard K. Fujiwara, DIRECTOR AND CHIEF ENGINEER — DATE: 4/4/02

DRAWN BY: TM | CHECKED BY: | SPECIFIED BY: LMT | FILE NO.
FIELD BOOK NO. | SCALE: AS NOTED | SHEET 28 OF 31 SHEETS



02-031A

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED
1	2/19/04	PCO 1: REVISED PAVEMENT AREAS, DETAILS	MBC	

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
WAIANAKOLU, OAHU, HAWAII

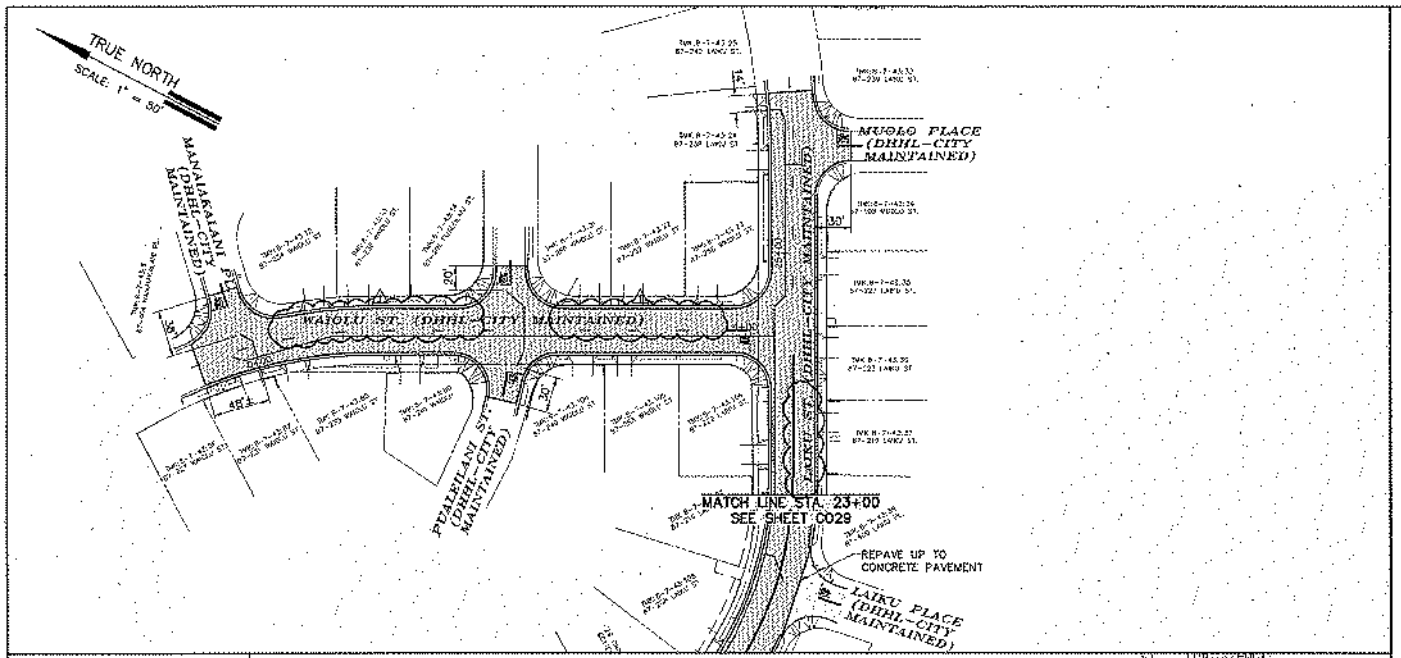
PAVING PLAN

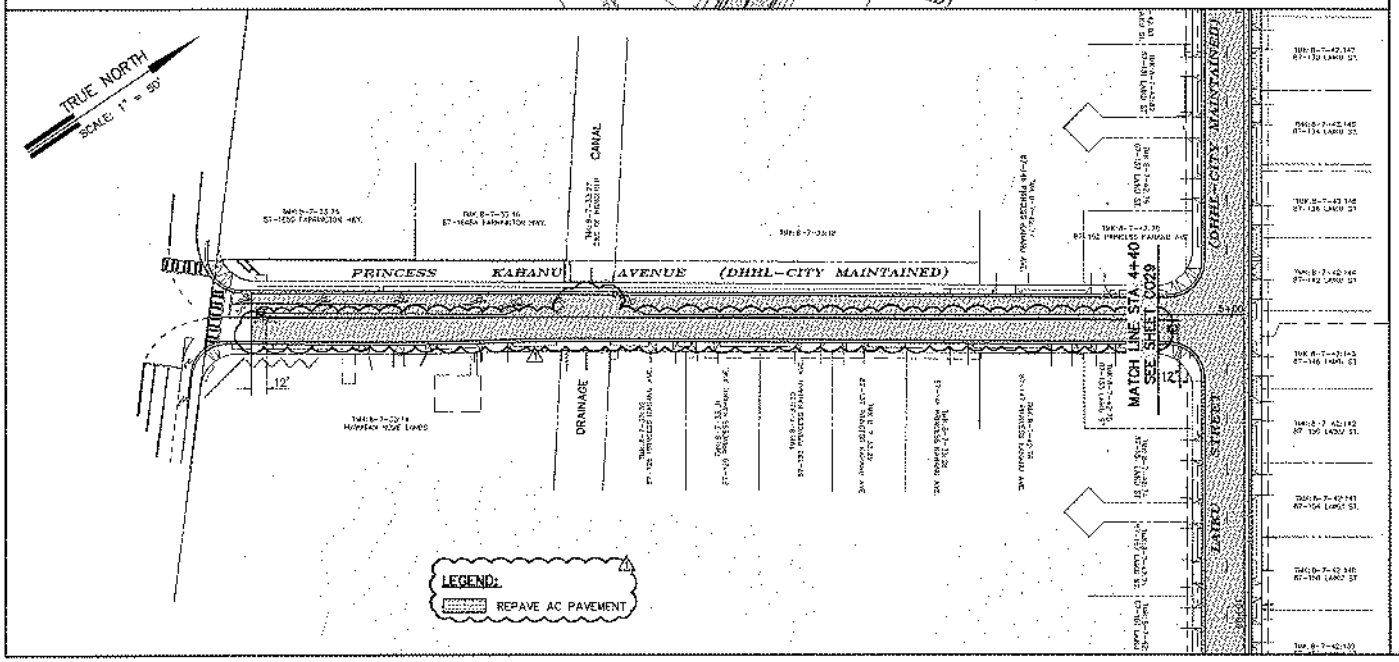
ALAN Y. TOMITA
LICENSED PROFESSIONAL ENGINEER
NO. 4839-C
HAWAII U.S.A.

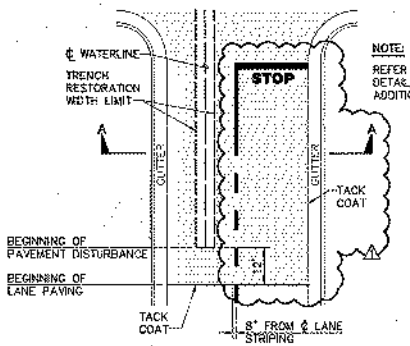
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
EXP 4/30/04

APPROVED: _____ DATE: 2/20/04
MANAGER, MAINTENANCE DIV'N, BWS

DESIGN BY: CDM | ENGINEER: MTH | CHECKED BY: LHF | DLC NO.
TITLE MAP NO. | SCALE: NO SCALE | SHEET C029 OF 31 SHEETS



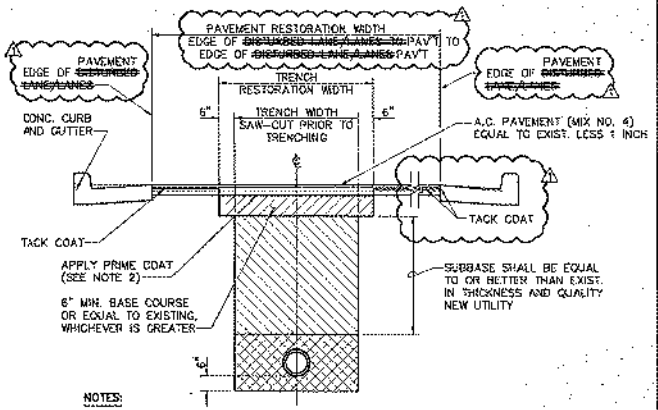




NOTE:
REFER TO WHEELCHAIR RAMP DETAIL, SHEETS 21 - 25 FOR ADDITIONAL REPAVING LIMITS.

REPAVING DETAIL

NOT TO SCALE



NOTES:

1. PAVEMENT STRUCTURE SHALL BE EQUAL TO OR BETTER THAN EXISTING IN THICKNESS AND QUALITY.
2. FOR ROAD GRADES 0% TO 7.99%, PRIME COAT IS NOT REQUIRED.
3. FOR PAVEMENT RESTORATION, COLD PLANE 1-1/2 INCH MINIMUM OF A.C. THEN REPAVE DESIGNATED AREAS WITH 1-1/2 INCH OF A.C. MIX #4.
4. ALL DISTURBED PAVEMENT MARKINGS SHALL BE REPLACED AND ALL REQUIRED UTILITY ADJUSTMENTS SUCH AS MANHOLE COVERS, ETC. SHALL BE DONE BY THE PERMITTEE.
5. THE CONTRACTOR SHALL ADJUST ALL MANHOLE FRAMES/VALVE BOXES WITHIN THE RESURFACED AREA PRIOR TO RESURFACING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR "REFERENCING" THESE MANHOLES/VALVE BOXES TO FACILITATE THE ADJUSTMENT.

SECTION "A - A"

NOT TO SCALE

02-031A

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED
1	2/19/04	PCO 1: REVISED PAVEMENT AREAS, DETAILS, NOTES	M&E	BWS

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS:
NANAKULI, OAHU, HAWAII

PAVING PLAN

ALAN T. TOMITA LICENSED PROFESSIONAL ENGINEER NO. 4129-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
EXP. 4/30/04

APPROVED: _____ LEADER, WASTEWATER UNIT, E&S
DATE: 2/20/04

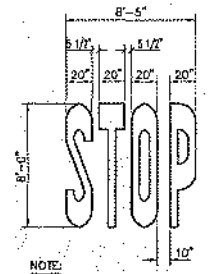
DESIGNED BY: CDY | DRAWN BY: CDY | CHECKED BY: LHF | FILE NO.
FIELD BOOK NO. | SCALE: NO SCALE | SHEET C030 OF 31 SHEETS

SIGNS AND MARKING NOTES:

1. ALL TRAFFIC SIGN AND PAVEMENT MARKING INSTALLATIONS SHALL BE DONE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," 1988 EDITION, AS AMENDED, THE LATEST SPECIFICATIONS FROM THE TRAFFIC REVIEW BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AND AS SHOWN ON THE PLANS.
2. CONTRACTOR SHALL NOTIFY AND COORDINATE WORK WITH THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, ONE (1) WEEK IN ADVANCE OF COMMENCING WORK AT 523-4881.
3. CONTRACTOR SHALL SUBMIT MATERIAL BROCHURES FOR ALL SIGNS AND PAINT MATERIALS TO THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING.
4. THE SIGNING AND/OR STRIPING CONTRACTOR SHALL KEEP ONE (1) SET OF APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION WORK.
5. CONTRACTOR SHALL PAINT TEMPORARY GUIDELINES AND OUTLINE OF ARROWS, LEGENDS, AND CROSSWALKS WITH A TWO INCH (2") WIDE BRUSHED LINE ON THE DAY THE ROADWAY IS OPENED TO TRAFFIC. THESE MARKINGS MUST BE APPROVED BY THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING.
6. CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AT 523-4881, THREE (3) DAYS IN ADVANCE OF FINAL INSPECTION.
7. CONTRACTOR SHALL MEET WITH THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING DURING THE FINAL INSPECTION.
8. WITHIN TEN (10) DAYS FOLLOWING NOTIFICATION OF AWARD OF CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE DEPARTMENT OF PLANNING AND PERMITTING (PHONE: 523-4881) FOR APPROVAL, A LIST OF ANY SIGNING AND PAVEMENT MARKING MATERIAL WHICH HE PROPOSES TO INSTALL. THE LIST SHALL BE COMPLETE AS TO THE NAME OF MANUFACTURER, CATALOG NUMBER, AND SHALL BE SUPPLEMENTED WITH MATERIAL BROCHURES.
9. UPON FINAL INSPECTION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT A LETTER OF CERTIFICATION FOR ALL TRAFFIC SIGNING AND PAVEMENT MARKING MATERIALS INSTALLED.
10. SIGNS SHALL BE ATTACHED TO BRACKETS WITH 5/16" ZINC PLATED STEEL BOLTS, NUTS AND WASHERS. SIGNS 48" WIDE OR LARGER THAN 10 SQ. FT. IN AREA SHALL BE MOUNTED ON TWO 2" GALV. PIPE POST. THE SIGN SHALL BE INSTALLED WITH AT LEAST (1) ONE FOOT CLEARANCE FROM THE SIGN EDGE TO THE CURB FACE.
11. ALL TRAFFIC SIGNS SHALL BE REFLECTORIZED.
12. RAISED PAVEMENT MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
13. LOCATION OF "STOP" SIGN:
    A. INSTALL "STOP" SIGN AT CURB TANGENT POINT.
    B. INSTALL "STOP" SIGN ON METAL STREET LIGHT STANDARD IF A STANDARD IS LOCATED WITHIN 10 FEET OF CURB RETURN.
    C. INSTALL "STOP" SIGN IN FRONT OF UTILITY POLE IF A POLE IS LOCATED WITHIN 10 FEET OF CURB RETURN.
14. PAVEMENT WORD AND SYMBOL MARKINGS SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
15. THE CONTRACTOR SHALL USE THERMOPLASTIC MATERIAL, APPROVED BY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, FOR ALL CROSSWALKS, STOP BARS, PAVEMENT ARROWS, CENTER LINES, LANE LINES, ARC LINES, CHANNELIZED TRAFFIC ISLANDS, AND LEGENDS.

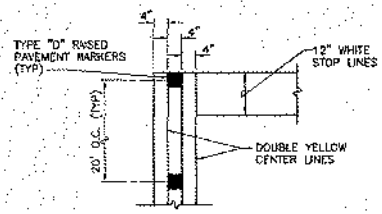
NOTE:

REFER TO "WHEELCHAIR RAMP DETAIL PLAN", SHEETS 21 - 25 FOR ADDITIONAL RESTRIPING LIMITS.

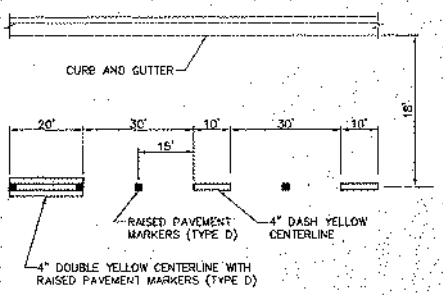


NOTE:
WHEN THIS MARKING IS USED, IT SHALL BE PAINTED IN EACH LANE OF TRAFFIC APPROACHING THE INTERSECTION.

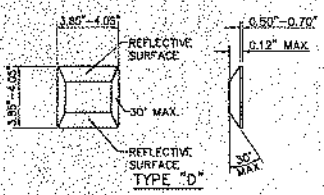
PAVEMENT WORD DETAIL
NOT TO SCALE



DOUBLE SOLID YELLOW WITH RAISED PAVEMENT MARKERS
NOT TO SCALE

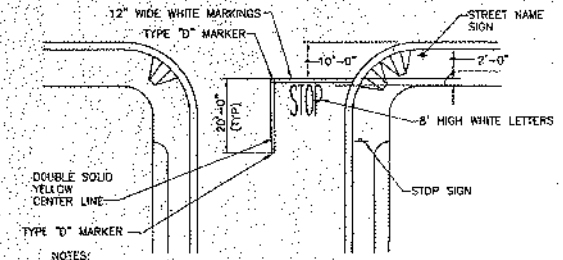


YELLOW CENTERLINE AND RAISED PAVEMENT MARKERS
NOT TO SCALE



TWO-WAY YELLOW REFLECTIVE MARKER

STANDARD RAISED PAVEMENT MARKERS
NOT TO SCALE



NOTES:
1. INSTALL "STREET NAME" SIGN CENTER OF CURB RETURN OR ON MAIN STREET SIDE OF WHEEL CHAIR RAMP
2. LOCATION OF STOP SIGN:
   A. INSTALL "STOP SIGN AT CURB RETURN TANGENT POINT
   B. INSTALL "STOP" SIGN ON METAL STREET LIGHT STANDARD IF THE LIGHT STANDARD IS LOCATED WITHIN 10' OF CURB RETURN

TYPICAL INTERSECTION SIGN AND PAVEMENT MARKINGS
NOT TO SCALE

GRAPHIC SCALE:

4' 2' 0 4' 8'

SCALE: 1/4" = 1'-0"

LESTER H. FUKUDA LICENSED PROFESSIONAL ENGINEER No. 4938-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

02-031A

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 02-031A
LAIKU STREET WATER SYSTEM IMPROVEMENTS
HONOLULU, OAHU, HAWAII

RESTRIPING NOTES AND DETAILS

APPROVED: Edward K. Lyuoka, Jr. DATE: 9/6/02
DIVISION OF T&D, MAINTENANCE UNIT, BWS

DRAWN BY: T.N. | ENGINEER: K.T.N. | CHECKED BY: L.H.F. | FILE NO.:
FIELD BOOK NO.: | SCALE: AS NOTED | SHEET 31 OF 31 SHEETS

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

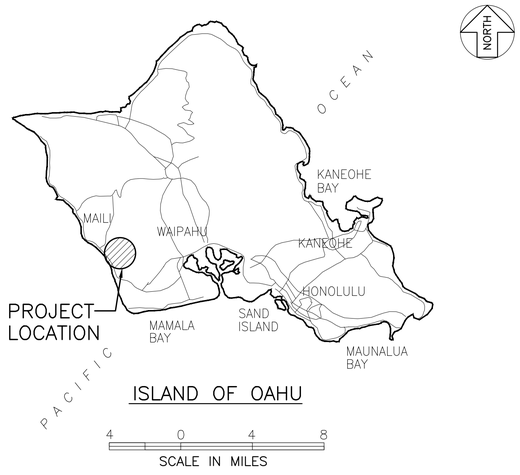
91-5420 KAPOLEI PARKWAY
KAPOLEI, HAWAII 96707

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

OAHU, HAWAII
IFB-25-HHL-002

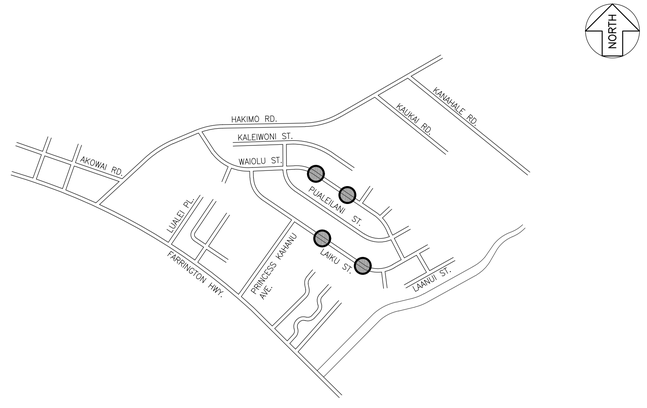
PREPARED BY:
AUSTIN TSUTSUMI AND ASSOCIATES, INC.
501 SUMNER STREET, SUITE 521 HONOLULU, HAWAII 96817

LOCATION MAP



ISLAND OF OAHU

VICINITY PLAN



● PROJECT SITES

LOCATION PLAN
NOT TO SCALE

APPROVED

CHAIRMAN, HAWAIIAN HOMES COMMISSION
STATE OF HAWAII

DATE

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

T-001

FILE	POCKET	FOLDER	NO.

INDEX TO DRAWINGS

SHEET	DRAWING	DESCRIPTION
1	T-001	TITLE SHEET
2	C-001	INDEX, LEGEND, AND ABBREVIATIONS
3	C-002	CONSTRUCTION NOTES – 1
4	C-003	CONSTRUCTION NOTES – 2
5	C-004	CONSTRUCTION NOTES – 3
6	C-005	CONSTRUCTION NOTES – 4
7	C-006	CONSTRUCTION NOTES – 5
8	C-007	CONSTRUCTION NOTES – 6
9	C-008	CONSTRUCTION NOTES – 7
10	C-009	GENERAL SITE PLAN
SPEED HUMPS		
11	C-010	SPEED HUMP 1 – LAIKU STREET
12	C-011	SPEED HUMP 2 – LAIKU STREET
13	C-012	SPEED HUMP 3 – WAIOLU STREET
14	C-013	SPEED HUMP 4 – WAIOLU STREET
15	C-014	MISCELLANEOUS DETAILS – 1
16	C-015	MISCELLANEOUS DETAILS – 2
TRAFFIC CONTROL PLANS		
17	TC-001	TRAFFIC CONTROL PLAN – 1 SPEED HUMP 1
18	TC-002	TRAFFIC CONTROL PLAN – 2 SPEED HUMP 1
19	TC-003	TRAFFIC CONTROL PLAN – 3 SPEED HUMP 2
20	TC-004	TRAFFIC CONTROL PLAN – 4 SPEED HUMP 2
21	TC-005	TRAFFIC CONTROL PLAN – 5 SPEED HUMP 3
22	TC-006	TRAFFIC CONTROL PLAN – 6 SPEED HUMP 3
23	TC-007	TRAFFIC CONTROL PLAN – 7 SPEED HUMP 4
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EROSION AND SEDIMENT CONTROL		
25	ES-001	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
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LEGEND

EXISTING		NEW
CATV BX	CABLE TELEVISION BOX	
	CATCH BASIN	
DI	DRAIN INLET	
DMH	DRAIN MANHOLE	
EBX	ELECTRIC BOX	
EHH	ELECTRIC HANDHOLE	
EMH	ELECTRIC MANHOLE	
EP	ELECTRICAL POLE	
EPB	ELECTRICAL PULLBOX	▱
FO	FIBER OPTIC	
FH	FIRE HYDRANT	
GR	GUARD RAIL	
GA	GUY ANCHOR	
GW	GUY WIRE	
HECO	HECO BOX	
HVPP	HIGH VOLTAGE POWER POLE (100' Metal Pipe)	
HB	HOSE BIBB	
LP	LIGHT POLE	
MB	MAIL BOX	
OH	OVERHEAD	
OH	OVERHEAD ELECTRICAL LINE	
PP	POWER POLE	
SMH	SEWER MANHOLE	
SCMH	SIGNAL CORPS MANHOLE	
SL	STREET LIGHT	
SLCAB	STREET LIGHT CABINET	
SLHH	STREET LIGHT HANDHOLE	
SL	STREET LIGHT POLE	○—○
SLPB	STREET LIGHT PULLBOX	
	STREET LIGHT STANDARD	
SWL	SWALE	
TBX/TEBX	TELEPHONE BOX	
THH	TELEPHONE HANDHOLE	
tug	TELEPHONE LINE	
TMH	TELEPHONE MANHOLE	
TP	TELEPHONE POLE	
TPB	TELEPHONE PULLBOX	
	TRAFFIC SIGN	Þ
TSCAB	TRAFFIC SIGNAL CABINET	
TSHH	TRAFFIC SIGNAL HANDHOLE	
TSP	TRAFFIC SIGNAL POLE	
TSPB	TRAFFIC SIGNAL PULLBOX	▭
TS	TRAFFIC SIGNAL STANDARD	
	TREE	
W12	UTILITY LINES AND SIZES AS INDICATED D = DRAIN G = GAS HTCO = HAWAIIAN TELCOM S = SEWER SL = STREET LIGHT W = WATER	
UBX	UTILITY BOX	
WMH	WATER MANHOLE	
WM	WATER METER	
WV	WATER VALVE	
WLP	WOOD LIGHT POLE	
WPP	WOOD POWER POLE	

ABBREVIATIONS

Δ	DELTA	O.C.	ON CENTER
&	AND	O.D.	OUTSIDE DIAMETER
@	AT	OH	OVERHEAD
A.C. OR A/C	ASPHALT CONCRETE	O/S	OFFSET
ADJ.	ADJUST		
AZ	AZIMUTH	PAV'T	PAVEMENT
℄	BASELINE	PB	PULLBOX
BC	BOTTOM CURB	PC	POINT OF CURVATURE
BCR	BOTTOM CURB RAMP		
BCW	BOTTOM CURB WALKWAY	PE	PLAIN END
BEG	BEGIN	PED	PEDESTRIAN
BLK.	BLOCK	PI	POINT OF INTERSECTION
BOT OR BOTT	BOTTOM	PL.	PLACE
BW	BOTTOM OF WALL	ℙ	PROPERTY LINE
		POC	POINT OF CURVATURE
CATV OH	OVERHEAD CABLE TELEVISION	PP	POWER POLE
CATV UG	UNDERGROUND CABLE TELEVISION	PT	POINT OF TANGENCY
CB	CATCH BASIN	PVC	POLYVINYL CHLORIDE
CBMH	CATCH BASIN MANHOLE		
Ch	CHORD LENGTH	R	RADIUS
℄	CENTERLINE	RD.	ROAD
CLR.	CLEAR	REFL.	REFLECTOR
CONC.	CONCRETE	REINF.	REINFORCED OR REINFORCEMENT
CONN.	CONNECTION	REQ'D	REQUIRED
CONT	CONTINUATION OR CONTINUOUS	RP	RADIUS POINT
CY	CUBIC YARD	RT.	RIGHT
		R.O.W. OR R/W	RIGHT-OF-WAY
ø, D	DIAMETER		
DBL.	DOUBLE	S	SLOPE
DET.	DETAIL	SCH	SCHEDULE
DMH	DRAIN MANHOLE	SF	SQUARE FOOT
DWY. OR D/W	DRIVEWAY	SL	STREET LIGHT
		SLCAB	STREET LIGHT CABINET
e	EXISTING	SLHH	STREET LIGHT HANDHOLE
EA	EACH	SLP	STREET LIGHT POLE
EHH	ELECTRIC HANDHOLE	SLPB	STREET LIGHT PULLBOX
ELEC.	ELECTRIC OR ELECTRICAL	SMH	SEWER MANHOLE
ELEV. OR EL	ELEVATION	SP	SIGN POST
EMH	ELECTRIC MANHOLE	S.S.	STAINLESS STEEL
E.P.	EDGE OF PAVEMENT	ST.	STREET
EPB	ELECTRICAL PULLBOX	STA.	STATION
ESW	EDGE OF SIDEWALK	STD	STANDARD
EXIST.	EXISTING	STRUCT.	STRUCTURE
		SVC.	SERVICE
FFE	FINISH FLOOR ELEVATION	S/W	SIDEWALK
FH	FIRE HYDRANT	SWL	SWALE
FIN	FINISHED		
FM	FORCE MAIN	T	TANGENT
FO	FIBER OPTIC	TC	TOP CURB
FT	FEET	TEL	TELEPHONE
		TEMP	TEMPORARY
GA	GUY ANCHOR	THH	TELEPHONE HANDHOLE
GND	GROUND	THK.	THICK
GRD.	GRADE	TMH	TELEPHONE MANHOLE
GW	GUY WIRE	TPB	TELEPHONE PULLBOX
		TRAV.	TRAVERSE
HB	HOSE BIBB	TS	TRAFFIC SIGNAL
HT.	HEIGHT	TSCAB	TRAFFIC SIGNAL CABINET
HORIZ, H	HORIZONTAL	TS/FO	TRAFFIC SIGNAL/ FIBER OPTIC
HP	HIGH POINT	TSHH	TRAFFIC SIGNAL HANDHOLE
		TSP	TRAFFIC SIGNAL POLE
JB	JUNCTION BOX	TSPB	TRAFFIC SIGNAL PULLBOX
		TW	TOP OF WALL
IN	INCHES	TP	TELEPHONE POLE
INV	INVERT ELEVATION	T/P	TOP OF PIPE
		T/V	TOP OF VALVE
LAT.	LATERAL	TYP	TYPICAL
LB	POUND		
Lc	LENGTH OF CURVE	UG	UNDERGROUND
LEN	LENGTH		
LF	LINEAL FEET	VERT	VERTICAL
LP	LIGHT POLE		
LP	LOW POINT	W	WIDE
LT.	LEFT	W/	WITH
		W	WATER LINE
MAX	MAXIMUM	WLP	WOOD LIGHT POLE
MB	MAILBOX	WM	WATER METER
MH	MANHOLE	WMH	WATER MANHOLE
MIN	MINIMUM	WPP	WOOD POWER POLE
MON	MONUMENT	WV	WATER VALVE
NO.	NUMBER		

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN CHAPTER 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

INDEX, LEGEND, AND ABBREVIATIONS

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

SUBMITTED BY _____ FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

GENERAL CONSTRUCTION NOTES

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.

2. WHEN EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS OR UNDERPINNING TO FULLY PROTECT IT FROM DAMAGE.

3. ANY PAVEMENT OUTSIDE THE CONTRACT ZONE LIMITS DAMAGED AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO ITS ORIGINAL, OR BETTER, CONDITION. SUCH RESTORATION SHALL BE TO THE SATISFACTION OF THE ENGINEER, AT CONTRACTOR'S EXPENSE

4. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES TO VERIFY THE ACTUAL LOCATION OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATING. THE CONTRACTOR SHALL COORDINATE ALL WORK.

5. ALL WORK CALLED FOR ON THE PLANS AND NOT ITEMIZED IN THE PROPOSAL AND ALL WORK NOT CALLED FOR BUT REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT, SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE VARIOUS BID ITEMS.

6. THE CONTRACTOR SHALL RESTORE TO ITS ORIGINAL CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL, DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL TO VARIOUS CONTRACT ITEMS.

7. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

8. THE EXISTING IMPROVEMENTS ON THE PREMISES, AND IN ADJACENT AREAS, THAT ARE NOT TO BE REMOVED, SHALL BE PRESERVED AND PROTECTED. ANY AND ALL DAMAGES RESULTING FROM THE CONTRACTOR'S CONSTRUCTION OPERATIONS SHALL BE REPLACED AND REPAIRED TO ORIGINAL CONDITION, TO THE SATISFACTION OF THE OWNER AND PAID FOR BY THE CONTRACTOR.

9. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

10. THE CONTRACTOR SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY AND COUNTY OF HONOLULU SHALL REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.

11. THE GENERAL CONTRACTOR/DEVELOPER/OWNER OF THE PROJECT SHALL BE RESPONSIBLE FOR CONFORMANCE WITH APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS," AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

    THE GENERAL CONTRACTOR/DEVELOPER/OWNER OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

    1. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
    2. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

    IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT HTTP://HEALTH.HAWAII.GOV/CWB. THE OWNER/DEVELOPER/CONTRACTOR IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

GENERAL CONSTRUCTION NOTES (CONT'D.)

12. UNLESS RELOCATION IS CALLED FOR ON THE PLANS, EXISTING UTILITIES SHALL REMAIN IN SERVICE AND IN PLACE. IF RELOCATION OF EXISTING UTILITIES IS REQUIRED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE KEPT TO A MINIMUM AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE ENGINEER.

13. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES AND STRUCTURES SHOWN ARE BASED ON AVAILABLE RECORDS, VERIFIED WHENEVER POSSIBLE BY FIELD SURVEYS. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION AND INVERTS OF ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS, AND SHALL PROTECT SUCH UTILITIES AT ALL TIMES. DAMAGE TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. INJURY TO PERSONNEL RESULTING FROM CONTACT WITH THE EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

14. ALL CONSTRUCTION WORK WITHIN THE ROADWAY SHALL BE DONE BETWEEN THE HOURS OF 8:30 AM TO 3:30 PM, MONDAY THROUGH FRIDAY. CONSTRUCTION WORK MUST BE CLEAR FROM ROADWAY BY 3:30 PM.

15. EXISTING PAVEMENT AND PAVEMENT MARKINGS THAT ARE DAMAGED BY THE CONTRACTOR'S CONSTRUCTION OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE ENGINEER AND PAID FOR BY THE CONTRACTOR.

16. THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND SERVICES TO PROPERLY PERFORM AND FULLY COMPLETE ALL WORK SHOWN ON CONTRACT, DRAWINGS AND SPECIFICATIONS.

17. ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS SHALL BE CHECKED AND VERIFIED PRIOR TO THE START OF CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

18. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.

19. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".

20. THE CONTRACTOR SHALL APPLY AND PAY FOR ALL NECESSARY CONSTRUCTION PERMITS.

21. THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM DRIVEWAYS AND PUBLIC STREETS AT ALL TIMES.

22. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.

23. ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION, AND ANY DAMAGE TO THEM SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.

24. CONFINED SPACE:

    FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(b), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:

    I. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE BUT NOT LIMITED TO, THE FOLLOWING:

        a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
        b. LIFELINE AND ASSOCIATED CLIPS.
        c. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
        d. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
        e. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
        f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
        g. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
        h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.

    II. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.

    III. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).

GENERAL CONSTRUCTION NOTES (CONT'D.)

25. FOR PROJECTS ABUTTING STATE HIGHWAYS' RIGHT-OF WAY, THE OWNER OR AUTHORIZED REPRESENTATIVE SHALL NOTIFY THE STATE DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION, OAHU DISTRICT, DRAINAGE DISCHARGE UNIT AT 831-6793 FOR ASSESSMENT OF STATE HIGHWAYS PERMIT REQUIREMENTS.

26. THE CONTRACTOR SHALL BECOME FAMILIAR WITH AND SHALL MEET THE LATEST REQUIREMENTS OF THE CITY DEPARTMENT OF TRANSPORTATION SERVICES (DTS). THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY (DTS) BEFORE APPLYING FOR A STREET USAGE PERMIT. THE TRAFFIC CONTROL PLAN SHALL MEET ALL DTS REQUIREMENTS INCLUDING PREPARATION BY, OR UNDER THE SUPERVISION OF, A LICENSED PROFESSIONAL ENGINEER.

27. DURING NON-WORKING HOURS NO CONSTRUCTION EQUIPMENT SHALL BE PARKED WITHIN THE ROAD RIGHT-OF-WAY IN SUCH A MANNER THAT THE EQUIPMENT WILL OBSTRUCT THE NORMAL MOVEMENT AND SIGHT DISTANCE OF THE DRIVING MOTORIST.

28. EXCEPT DURING ACTUAL WORKING HOURS, ALL SIGNS WHICH DO NOT PERTAIN TO THE CONSTRUCTION ACTIVITY, SUCH AS "ROAD WORK" AND "FLAGGER AHEAD" SHALL BE COVERED OR LAID DOWN. HOWEVER, ALL SIGNS NECESSARY FOR THE SAFETY OF THE PUBLIC SHALL BE MAINTAINED.

29. THE CONTRACTOR SHALL EMPLOY A HAWAII LICENSED PROFESSIONAL LAND SURVEYOR TO PERFORM ALL CONSTRUCTION STAKEOUTS, THE COST OF WHICH SHALL BE BORNE BY THE CONTRACTOR.

30. THE CONTRACTOR SHALL MAKE OWN ARRANGEMENTS FOR, AND PAY FOR ALL TEMPORARY UTILITIES REQUIRED FOR THE WORK.

31. EXISTING DRAINAGE SYSTEM WILL BE FUNCTIONAL AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR IS TO FURNISH MATERIALS, EQUIPMENT, LABOR, TOOLS AND INCIDENTALS NECESSARY TO ACCOMPLISH MAINTENANCE OF FLOW, THE COST OF WHICH SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS, AND WILL NOT BE PAID FOR SEPARATELY.

32. WHENEVER THE CENTER OF A STREET SURVEY MONUMENT IS LESS THAN THREE (3) FEET AWAY FROM THE EDGE OF TRENCH, THE CONTRACTOR SHALL RETAIN A LICENSED LAND SURVEYOR TO REFERENCE THE LOCATION OF SAID STREET MONUMENT. ALL REFERENCING WORK SHALL BE SUBMITTED TO THE DEPARTMENT DESIGN AND CONSTRUCTION, DIVISION OF LAND SURVEY AND ACQUISITION, FOR REVIEW AND APPROVAL BEFORE COMMENCEMENT OF CONSTRUCTION ADJACENT TO STREET MONUMENTS.

33. STREET MONUMENTS THAT ARE DISTURBED SHALL BE RESTORED UNDER THE LICENSED LAND SURVEYOR'S DIRECTION. ANY NEW DATA SUCH AS ELEVATIONS SHALL BE CERTIFIED BY THE SURVEYOR AND SUBMITTED TO THE DEPARTMENT OF PLANNING AND PERMITTING.

34. THE CONTRACTOR SHALL RELOCATE EXISTING IRRIGATION SYSTEM INCLUDING IRRIGATION PIPE AND CONTROL VALVES WITHIN LANDSCAPE PLANT AREA.

35. CONTRACTOR SHALL NOT STOCKPILE MATERIALS OR EQUIPMENT WITHIN KNOWN HISTORIC PERIOD RESOURCES AREAS AS LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES.

36. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGEMENT BRANCH, DDC AT 768-8840 TO ARRANGE FOR INSPECTIONAL SERVICES SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.

37. TEMPORARY PEDESTRIAN ROUTES SHALL BE MAINTAINED IN SAFE, PASSABLE AND ACCESSIBLE CONDITION COMPLYING WITH ADAAG 206 AND 402.

38. CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE COMMENCEMENT OF WORK ON ANY SITE WITH TREES IN CLOSE PROXIMITY (15 FT).

39. ALL CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION 2005" AS AMENDED, AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", DATED SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTIES OF THE STATE OF HAWAII, THE "STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION STANDARD PLANS" 2008, THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICE FOR STREETS AND HIGHWAYS", 2009, AND THE CONSTRUCTION DRAWINGS, DETAILS & SPECIFICATIONS PREPARED FOR THIS PROJECT.

40. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES.

GENERAL CONSTRUCTION NOTES (CONT'D.)

41. WHEREVER CROSSINGS OR CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR DAMAGES TO THE FACILITIES WHETHER SHOWN OR NOT ON THE PLANS.

42. NO CONSTRUCTION EQUIPMENT SHALL BE PARKED WITHIN THE ROAD RIGHT-OF-WAY IN SUCH A MANNER THAT THE EQUIPMENT WILL OBSTRUCT THE NORMAL MOVEMENT AND SIGHT DISTANCE OF THE DRIVING MOTORIST, EXCEPT DURING ACTUAL WORKING HOURS.

43. THE CONTRACTOR SHALL HAVE AN ARCHAEOLOGICAL MONITOR PRESENT DURING GROUND DISTURBING ACTIVITIES. THE ARCHAEOLOGICAL MONITOR SHALL INSPECT THE EXPOSED SOIL AND THE STRATIGRAPHIC PROFILE OF ANY EXCAVATED TRENCHES IN AN EFFORT TO IDENTIFY ANY PREVIOUSLY UNDISCOVERED AND UNDISTURBED HISTORIC SITES OR REMAINS. SHOULD HISTORIC SITES SUCH AS WALLS, PLATFORMS, PAVEMENTS AND MOUNDS, OR REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF CHARCOAL OR SHELLS BE ENCOUNTERED DURING CONSTRUCTION WORK, WORK SHALL CEASE IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE STATE HISTORIC PRESERVATION DIVISION ((808) 692-8015), WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND AN APPROPRIATE MITIGATION MEASURE, IF NECESSARY. A 3-METER / 10-FOOT WIDE BUFFER ZONE EXISTS AROUND ALL SITES IN PRESERVATION DURING CONSTRUCTION. IT IS HIGHLY IMPORTANT THAT THE PRESERVED SITES REMAIN UNDISTURBED.

44. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.

45. THE CONTRACTOR SHALL RESTORE ALL EXISTING FACILITIES INCLUDING BUT NOT LIMITED TO PAVEMENT, DRAINAGE FACILITIES, CURBS, GUTTERS, SIGNS, LANDSCAPING, IRRIGATION SYSTEMS, ETC., REMOVED OR DAMAGED AS A RESULT OF HIS OPERATION USING MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION", 2005 AS AMENDED, "STANDARD DETAILS", SEPTEMBER 1984 FOR PUBLIC WORKS CONSTRUCTION OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF MAUI, AS AMENDED.

46. THE CONTRACTOR SHALL REMOVE AND DISPOSE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS WORK. THE COST INCURRED FOR ANY NECESSARY REMEDIAL ACTION ORDERED BY THE DIRECTOR OF PUBLIC WORKS SHALL BE PAID BY THE CONTRACTOR.

47. CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE SITE. THE CONTRACTOR SHALL INFORM THE DIRECTOR OF PUBLIC WORKS OF THE LOCATION OF THE DISPOSAL SITES. THE DISPOSAL SITE MUST FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE. THE CONTRACTOR SHALL MINIMIZE ITS CONSTRUCTION DEBRIS AND SOLID WASTES.

48. CONTRACTOR SHALL PROVIDE VEHICULAR AND PEDESTRIAN ACCESS ROUTES AT ALL TIMES TO ALL EXISTING FACILITIES.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

_____ 4/30/26
signature expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-3, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 1

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

SUBMITTED BY _____ FIRM MEMBER _____ DATE

FILE	POCKET	FOLDER	NO.

C-002

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK UPON STATE HIGHWAYS FROM THE OAHU DISTRICT ENGINEER, STATE HIGHWAYS, AT 727 KAKOI STREET, PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE'S HIGHWAY RIGHT-OF-WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN THE STATE'S RIGHT-OF-WAY, INCLUDING THE LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC, SHALL BE IN ACCORDANCE WITH THE CURRENT HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. WORK MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. AND 3:00 P.M., MONDAY THROUGH FRIDAY, EXCEPT STATE HOLIDAYS, UNLESS WHEN OTHERWISE APPROVED IN WRITING BY THE DISTRICT ENGINEER.

   DURING WORK HOURS, ONLY ONE LANE OF TRAFFIC SHALL BE CLOSED, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT ENGINEER.

   AT CERTAIN LOCATIONS, "NO LANE CLOSURE" WILL BE ALLOWED DURING THE "BACK TO SCHOOL JAM", THANKSGIVING WEEKEND, CHRISTMAS/NEW YEAR PERIOD AND AT OTHER TIMES AS DIRECTED BY THE HIGHWAYS DIVISION.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES, AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS", ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE "U.S. FEDERAL HIGHWAY ADMINISTRATION MUTCD-MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, PART VI-TEMPORARY TRAFFIC CONTROL".

   LANE CLOSURES SHALL CONFORM TO THE TRAFFIC CONTROL PLAN INCORPORATED INTO THESE CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.

5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:

   a. RESIDENTIAL DRIVEWAYS, ON MINOR HIGHWAYS:
      (1) 2-1/2" ASPHALT CONCRETE (MIX IV), 6" AGGREGATE BASE COURSE AND 12" SUBBASE, OR 2-1/2" ASPHALT CONCRETE AND 6" ASPHALT CONCRETE BASE COURSE.

      (2) 6" OF CLASS "A" CONCRETE REINFORCED WITH 6"x6"-W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   b. COMMERCIAL DRIVEWAYS AND SIDEROADS ON MINOR HIGHWAYS:

      (1) 2-1/2" ASPHALT CONCRETE (MIX IV), 6" ASPHALT CONCRETE BASE COURSE AND 12" SUBBASE, OR 4" ASPHALT CONCRETE (MIX IV) AND 8" ASPHALT CONCRETE BASE COURSE.

      (2) 8" OF CLASS "A" CONCRETE REINFORCED WITH 6"x6" - W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   c. CHANNELIZED INTERSECTIONS ON MAJOR HIGHWAYS:
      4" ASPHALT CONCRETE (MIX IV), 8" ASPHALT CONCRETE BASE COURSE AND 12" AGGREGATE SUBBASE, OR 4" ASPHALT CONCRETE (MIX IV) AND 12" ASPHALT CONCRETE BASE COURSE.

6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN THE HIGHWAY RIGHT-OF-WAY, EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

   a. SUBBASE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.

   b. BASE COURSE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.

   c. ONE (1) COMPACTION TEST PER LIFT PER 300 LINEAL FEET OF TRENCH.

   d. A COPY OF THE TEST RESULTS SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY (CONT.)

8. EXISTING DRAINAGE SYSTEMS SHALL BE FUNCTIONAL AT ALL TIMES.

9. THE CONTRACTOR SHALL EXERCISE CARE TO MINIMIZE DAMAGES TO EXISTING HIGHWAY IMPROVEMENTS. ALL DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR, AT HIS EXPENSE, TO THE SATISFACTION OF THE DISTRICT ENGINEER.

10. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT THE CONSTRUCTION PLANS FOR THE DIVISION'S REVIEW AND RE-APPROVAL.

11. ALL REGULATORY, GUIDE, AND CONSTRUCTION SIGNS AND BARRICADES SHALL HAVE A HIGH-INTENSITY TYPE III OR IV RETROREFLECTIVE BACKGROUND.

12. THE CONTRACTOR SHALL INFORM THE STATE HIGHWAY'S PERMIT OFFICE (831-6712) AT LEAST TWO (2) DAYS PRIOR TO CLOSING ANY LANES.

13. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTIES USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

14. WHERE PEDESTRIAN WALKWAYS EXIST THEY SHALL BE MAINTAINED IN A SAFE AND PASSABLE CONDITION, OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGES BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED. ALL WALKWAYS SHALL CONFORM TO ADA REQUIREMENTS.

15. THE CONTRACTOR SHALL REFERENCE, TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL EXISTING TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES, AT HIS EXPENSE, UNLESS DIRECTED BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

16. THE CONTRACTOR SHALL EXERCISE CARE WHEN PERFORMING WORK IN OR ADJACENT TO THE STATE HIGHWAY RIGHT-OF-WAY. DAMAGES TO THE EXISTING FACILITIES SHALL BE IMMEDIATELY REPORTED TO THE RESPECTIVE UTILITY COMPANIES, AND/OR CITY OR STATE AGENCIES. THE REPAIR WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.

17. HIGHWAY LIGHTS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. SHOULD WORK BE NECESSARY, THE CONTRACTOR SHALL NOTIFY THE STATE HIGHWAYS' HIGHWAY LIGHTING SUPERVISOR (837-8056), THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK.

18. THE CONTRACTOR SHALL NOTIFY THE CITY DEPARTMENT OF TRANSPORTATION SERVICES, TRAFFIC SIGNAL ENGINEER (768-8388), THREE (3) DAYS PRIOR TO ANY SIGNALIZED INTERSECTION WORK.

19. TRAFFIC SIGNALS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. OPERATIONAL MICROWAVE OR OTHER APPROVED DETECTION DEVICES INSTALLED THREE (3) WORKING DAYS PRIOR TO ANY SIGNALIZED INTERSECTION EXCAVATION WORK. ALL WORK SHALL BE DONE IN ACCORDANCE TO THE REQUIREMENTS OF THE DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU, AND PAID FOR BY THE CONTRACTOR.

20. THE CONTRACTOR SHALL NOTIFY OAHU TRANSIT SERVICES, INC. (OTS), AT 848-4578, TWO WEEKS PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR SHALL INFORM OTS OF THE LOCATION AND SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUSY STOP.

21. THE PERMIT TO PERFORM WORK UPON STATE HIGHWAY MAY BE REVOKED BECAUSE OF DEFAULT IN ANY OF THE FOLLOWING, BUT NOT LIMITED TO, CONDITIONS:

   a. WORK PERFORMED BEFORE OF AFTER PERMITTED HOURS.

   b. FAILURE TO MAINTAIN ROADWAY SURFACES IN A SMOOTH AND SAFE CONDITION.

   c. FAILURE TO CLEAN UP CONSTRUCTION DEBRIS GENERATED FROM PROJECT WORK.

   d. FAILURE TO PROVIDE PROPER TRAFFIC CONTROL.

   e. FAILURE TO REPLACE DAMAGED PAVEMENT MARKINGS AND SIGNS.

   f. FAILURE TO MAINTAIN HIGHWAY LIGHTS AND/OR TRAFFIC SIGNAL SYSTEMS.

   g. FAILURE TO ADDRESS PUBLIC COMPLAINTS TO THE SATISFACTION OF THE DISTRICT ENGINEER.

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY (CONT.)

22. PLASTIC MARKING TAPE. PROVIDE PLASTIC MARKING TAPE THAT IS ACID AND ALKALI RESISTANT POLYETHYLENE FILM 6 INCHES WIDE WITH MINIMUM THICKNESS OF 0.004 INCH. PROVIDE TAPE WITH MINIMUM STRENGTH OF 1750 PSI LENGTHWISE AND 1500 INTEGRAL WIRES, FOIL BACKING OR OTHER PSI CROSSWISE. MANUFACTURE TAPE WITH A METAL DETECTOR WHEN THE TAPE IS BURIED UP MEANS TO ENABLE DETECTION BY UP TO 3 FEET DEEP. MANUFACTURE TAPE SPECIFICALLY FOR MARKING AND LOCATING UNDERGROUND UTILITIES. PROVIDE THE METALLIC CORE OF THE TAPE ENCASED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. CONFORM TO THE FOLLOWING TAPE COLOR AND BEAR A CONTINUOUS PRINTED INSCRIPTION DESCRIBING THE SPECIFIC UTILITY.

    RED : ELECTRIC
    YELLOW : GAS, OIL DANGEROUS MATERIALS
    ORANGE : TELEPHONE, TELEGRAPH, TELEVISION, POLICE, AND FIRE COMMUNICATIONS
    BLUE : WATER SYSTEMS
    GREEN : SEWER SYSTEMS

23. THE CONTRACTOR SHALL PROVIDE THE DISTRICT ENGINEER WITH AS-BUILT PLANS UPON COMPLETION OF THE WORK DONE IN THE STATE RIGHT-OF-WAY. THIS SHALL BE DONE PRIOR TO THE DEPARTMENT'S RELEASE OF THE PERFORMANCE BOND.

TRAFFIC NOTES FOR WORK ON CITY & COUNTY STREETS

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN. CONSTRUCTION TRAFFIC CONTROL PLANS APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES AND/OR THE DEPARTMENT OF PLANNING AND PERMITTING MUST BE PROVIDED WHEN APPLYING FOR THE PERMIT.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."

3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.

4. DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE FOR THROUGH TRAFFIC. DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL AND ALL LANES SHALL BE OPEN TO TRAFFIC.

5. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.

6. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL BE PROVIDED.

7. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

8. THE CONTRACTOR SHALL REFERENCE TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES AND THE DEPARTMENT OF PLANNING AND PERMITTING. ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGN, POSTS AND PAVEMENT MARKINGS DISTURBED BY HIS/HER ACTIVITIES.

9. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POST AND PAVEMENT MARKINGS.

10. NO EQUIPMENT SHALL BE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.

TRAFFIC NOTES FOR WORK ON CITY & COUNTY STREETS (CONT.)

11. THE DEPARTMENT OF HAWAIIAN HOME LANDS SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND THE HAWAII ADMINISTRATION RULES AS SPECIFIED IN THE TRAFFIC NOTE #2.

TRAFFIC SIGNAL AND TECHNOLOGY DIVISION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE: 768-8387).

2. THE TRAFFIC SIGNAL SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION REQUIRED SHALL BE APPROVED BY THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, AND PAID FOR BY THE CONTRACTOR.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE EXISTING TRAFFIC SIGNAL FACILITIES, INCLUDING BUT NOT LIMITED TO THE TRAFFIC SIGNAL FIBER OPTIC CABLE SYSTEM, AND INTERCONNECT SYSTEM. ANY AND ALL DAMAGES TO THE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE TRAFFIC SIGNALS AND TECHNOLOGY DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & Associates, Inc.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 2

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED DATE

SUBMITTED BY
FIRM MEMBER DATE

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

FILE	POCKET	FOLDER	NO.

SIGNS AND MARKING NOTES

1. ALL TRAFFIC SIGN AND PAVEMENT MARKING INSTALLATIONS SHALL BE DONE IN ACCORDANCE WITH "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," 2009 EDITION, AS AMENDED, THE LATEST SPECIFICATIONS FROM THE TRAFFIC REVIEW BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AND AS SHOWN ON THE PLANS.
2. CONTRACTOR SHALL NOTIFY AND COORDINATE WORK WITH THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, ONE (1) WEEK IN ADVANCE OF COMMENCING WORK AT 768-8084.
3. CONTRACTOR SHALL SUBMIT MATERIAL BROCHURES FOR ALL SIGNS AND PAINT MATERIALS TO THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING.
4. THE SIGNING AND/OR STRIPING CONTRACTOR SHALL KEEP ONE (1) SET OF APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION WORK.
5. CONTRACTOR SHALL PAINT TEMPORARY GUIDELINES AND OUTLINE OF ARROWS, LEGENDS, AND CROSSWALKS WITH A TWO INCH (2") WIDE BRUSHED LINE ON THE DAY THE ROADWAY IS OPENED TO TRAFFIC. THESE MARKINGS MUST BE APPROVED BY THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING PERMITTING.
6. CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084, (3) DAYS IN ADVANCE OF FINAL INSPECTION.
7. CONTRACTOR SHALL MEET WITH THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING DURING THE FINAL INSPECTION.
8. WITHIN TEN (10) DAYS FOLLOWING NOTIFICATION OF AWARD OF CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE DEPARTMENT OF PLANNING AND PERMITTING (PHONE: 768-8084) FOR APPROVAL, A LIST OF ANY SIGNING AND PAVEMENT MARKING MATERIAL WHICH HE PROPOSES TO INSTALL. THE LIST SHALL BE COMPLETE AS TO THE NAME OF MANUFACTURER, CATALOG NUMBER, AND SHALL BE SUPPLEMENTED WITH MATERIAL BROCHURES.
9. UPON FINAL INSPECTION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT A LETTER OF CERTIFICATION FOR ALL TRAFFIC SIGNING AND PAVEMENT MARKING MATERIALS INSTALLED.
10. SIGNS SHALL BE ATTACHED TO BRACKETS WITH 5/16" ZINC PLATED STEEL BOLTS, NUTS AND WASHERS. SIGNS 48" WIDE OR LARGER THAN 10 SQ. FT. IN AREA SHALL BE MOUNTED ON TWO – 2" GALV. PIPE POST. THE SIGN SHALL BE INSTALLED WITH AT LEAST (1) ONE FOOT CLEARANCE FROM THE SIGN EDGE TO THE CURB FACE.
11. ALL TRAFFIC SIGNS SHALL BE REFLECTORIZED.
12. RAISED PAVEMENT MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
13. LOCATION OF "STOP" SIGN:
    A. INSTALL "STOP" SIGN AT CURB TANGENT POINT.
    B. INSTALL "STOP" SIGN ON METAL STREET LIGHT STANDARD IF A STANDARD IS LOCATED WITHIN 10 FEET OF CURB RETURN.
    C. INSTALL "STOP" SIGN IN FRONT OF UTILITY POLE IF A POLE IS LOCATED WITHIN 10 FEET OF CURB RETURN.
14. PAVEMENT WORD AND SYMBOL MARKINGS SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
15. THE CONTRACTOR SHALL USE THERMOPLASTIC MATERIAL, APPROVED BY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, FOR ALL CROSSWALKS, STOP BARS, PAVEMENT ARROWS, CENTER LINES, LANE LINES, ARC LINES, CHANNELIZED TRAFFIC ISLANDS, AND LEGENDS.

DEPARTMENT OF TRANSPORTATION SERVICES (DTS) TRANSPORTATION MOBILITY DIVISION (TMD) CONSTRUCTION NOTE DATED AUGUST 2021

CONSTRUCTION OF THIS PROJECT SHALL NOT AFFECT TRANSIT OPERATIONS. BUS ROUTES AND BUS STOPS SHALL REMAIN OPEN AND ACCESSIBLE AT ALL TIMES. ANY WORK AFFECTING BUS OPERATIONS, ROUTES, OR STOPS MUST BE SUBMITTED TO DTS-TMD FOR REVIEW NO LESS THAN 30 DAYS PRIOR TO THE START DATE.

POINT TO CONTACT INFORMATION (NOTIFICATION IS REQUIRED TO ALL PHONE NOS. & EMAILS):

DTS-TMD
(808) 768-8371
THEBUSSTOP@HONOLULU.GOV
HANDIVAN@HONOLULU.GOV

OAHU TRANSIT SERVICES – BUS OPERATIONS
(808) 768-9520
(808) 768-9534
SEAN-BENNETT.PAIO@THEBUS.ORG
JOSHUA.VAOALII@THEBUS.ORG
WALTER.OBA@THEBUS.ORG

OAHU TRANSIT SERVICES – PARATRANSIT OPERATIONS
(808) 768-9802
(808) 768-9851
(808) 454-5021
TRACIE.COELHO@THEBUS.ORG
RICHARD.MOLE@THEBUS.ORG

CONTRACTOR'S RESPONSIBILITY FOR EXISTING LINES, PIPES AND SERVICES

1. INFORMATION REGARDING THE SITE OF THE WORK GIVEN ON THE DRAWINGS OR SPECIFICATIONS HAS BEEN OBTAINED BY THE ENGINEER AND IS BELIEVED TO BE REASONABLY CORRECT; HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL SUCH INFORMATION. THE CONTRACTOR SHALL TONE THE AREA TO BE EXCAVATED TO ASCERTAIN THE LOCATION OF UNCHARTED UTILITIES.
2. ANY UTILITIES THAT THE CONTRACTOR ENCOUNTERS DURING THE PROGRESS OF THE WORK, SUCH AS BUT NOT LIMITED TO TELEPHONE DUCTS, ELECTRIC DUCTS, WATER LINES, SEWER LINES, ELECTRIC LINES AND DRAINAGE PIPES, WHETHER SHOWN OR NOT ON THE CONTRACT PLANS, SHALL NOT BE DISTURBED OR DAMAGED UNLESS OTHERWISE INSTRUCTED IN THE PLANS AND SPECIFICATIONS.
3. IN THE EVENT THE UTILITIES ARE DAMAGED OR DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL BE HELD LIABLE FOR THE DAMAGED OR DISTURBED UTILITIES.
4. THE CONTRACTOR SHALL REPAIR THE DAMAGED OR DISTURBED UTILITIES TO THE EXISTING CONDITION AT NO COST TO THE OWNER. ANY DAMAGE CLAIMS DUE TO THE DISRUPTION OF SERVICE CAUSED BY THE UTILITIES BEING DAMAGED SHALL BE PAID BY THE CONTRACTOR, WHO SHALL SAVE HARMLESS THE OWNER AND ENGINEER FROM ALL SUITS, ACTIONS OR CLAIMS OF ANY CHARACTER BROUGHT ON ACCOUNT OF SUCH DAMAGES.
5. IN THE EVENT UTILITIES WHICH WERE NOT SHOWN ON THE PLANS AND SPECIFICATIONS ARE DAMAGED OR DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL BE HELD LIABLE. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND EXPOSE ALL UTILITY LINES PRIOR TO ANY EXCAVATION AND/OR INSTALLATION OF LINES.

PUBLIC HEALTH, SAFETY AND CONVENIENCE

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE COUNTY OF MAUI MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANING AND REMOVAL OF ALL SILT AND DEBRIS DEPOSITED AND ACCUMULATED WITHIN DOWNSTREAM WATERWAYS, DITCHES AND DRAIN PIPES AND ON PUBLIC AND PRIVATE ROADWAYS GENERATED BY HIS WORK. THE CONTRACTOR AGREES TO REIMBURSE THE COUNTY OF MAUI FOR ALL COSTS EXPENDED IN PERFORMANCE OF THE ABOVE WORK IF REQUIRED FOR PUBLIC HEALTH AND SAFETY, OR MADE NECESSARY BY NON-PERFORMANCE BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
5. THE CONTRACTOR SHALL PROVIDE A NOISE POLLUTION CONTROL PLAN WHEN APPLYING FOR A CONSTRUCTION PERMIT.
6. TEMPORARY PEDESTRIAN ROUTES SHALL BE MAINTAINED IN SAFE, PASSABLE AND ACCESSIBLE CONDITION COMPLYING WITH ADAAG 402.1.

SOLID WASTE CONSTRUCTION NOTES

1. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THE CONSTRUCTION INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE COUNTY LANDFILLS WILL BE SUBJECTED TO THE INSTITUTED TIPPING FEE SYSTEM, WITH NO EXCEPTIONS OR EXEMPTIONS.

PERMANENT EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL GRASS ALL EXPOSED AREAS THAT HAVE BEEN CONSTRUCTED TO FINAL GRADES WITHIN A PERIOD OF 30 CALENDAR DAYS. ALL COSTS FOR MAINTAINING AND WATERING PERMANENT EROSION CONTROL MEASURES WILL BE BORNE BY THE CONTRACTOR.

NOTES FOR ENVIRONMENTAL PROTECTION

1. ENVIRONMENTAL PROTECTION NOTES PERTAINING TO AIR AND WATER POLLUTION SHALL BE ADMINISTERED AND MONITORED BY THE DEPARTMENT OF HEALTH.
2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE EFFECTIVE MEASURES FOR THE CONTROL OF FUGITIVE DUST EMISSIONS FROM THE PROJECT AND SURROUNDING AREAS CAUSED BY HIS OPERATIONS, THESE MEASURES SHALL MEET THE REQUIREMENTS OF STATE ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, AIR POLLUTION CONTROL (11-60.1).
3. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE GRADING ORDINANCE TO PREVENT VIOLATION OF THE STATE ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS (11-54, 11-55) DUE TO EROSION AND RUNOFF TO STATE WATERS.
4. GRUB MATERIAL, DEMOLITION WASTES, AND CONSTRUCTION WASTES SHALL BE DISPOSED OF AT AN AUTHORIZED SITE HAVING A DEPARTMENT OF HEALTH SOLID WASTE MANAGEMENT PERMIT. OPEN BURNING IS PROHIBITED.
5. PERMITS REQUIRED:
    A. A NPDES PERMIT MAY BE REQUIRED FROM THE CLEAN WATER BRANCH OF THE DEPARTMENT OF HEALTH FOR STORM WATER DISCHARGE AND HYDROTESTING.
    B. A DEWATERING PERMIT MAY BE REQUIRED TO BE OBTAINED FROM THE CLEAN WATER BRANCH OF THE DEPARTMENT OF HEALTH IF DISCHARGING INTO STATE WATERS.
    C. PERMIT MUST BE OBTAINED PRIOR TO START OF CONSTRUCTION.
6. ENVIRONMENTAL PROTECTION NOTES PERTAINING TO AIR AND WATER POLLUTION SHALL BE ADMINISTERED AND MONITORED BY THE DEPARTMENT OF HEALTH.

EROSION SEDIMENT CONTROL NOTES FOR MINOR DEVELOPMENT PROJECTS:

1. USE BEST MANAGEMENT PRACTICES (BMPS) TO PREVENT AND REDUCE THE DISCHARGE OF POLLUTANTS FROM THE PROJECT SITE ONTO OFF-SITE STREETS, STORM DRAINS, STREAMS AND THE OCEAN. POTENTIAL POLLUTANTS INCLUDE BUT ARE NOT LIMITED TO SOIL, OIL PRODUCTS, PAINT, SOLVENTS, CONSTRUCTION DEMOLITION WASTE, TRASH, PORTABLE TOILETS, AC MATERIALS, CONCRETE, AND ANY OTHER LIQUID, PAVING OR WASHOUT MATERIAL THAT COULD BE DETRIMENTAL IF RELEASED TO THE ENVIRONMENT.
2. ANY EXPOSED SOIL FROM THIS ACTIVITY MUST BE PERMANENTLY OR TEMPORARILY STABILIZED IMMEDIATELY USING VEGETATION, GRAVEL, PAVERS, ROLLED EROSION CONTROL PRODUCTS, OR AN EQUIVALENT METHOD UNLESS ACTIVE WORK IS SCHEDULED WITHIN 14 DAYS.
3. ALL CONSTRUCTION WASTE AND WASHOUT WATER MUST BE PROPERLY CONTAINED AND DISPOSED OF.
4. SEDIMENT TRACKED OFF SITE MUST BE SWEPT OR VACUUMED DAILY.
5. DUST FROM THE PROJECT SITE SHALL NOT BE TRANSPORTED OR DISCHARGED TO OFF-SITE AREAS. THE WORK MUST BE IN CONFORMANCE WITH AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES: TITLE 11 CHAPTER 60.1, "AIR POLLUTION CONTROL."

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

REVISION	DATE	BRIEF	MADE BY	APPROVED

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION IN COMPLIANCE WITH CHAPTER 464, PART I, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

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LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 3

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED DATE

SUBMITTED BY FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S "STANDARD SPECIFICATIONS," SEPT. 1986, THE DEPARTMENT OF ENVIRONMENTAL SERVICES "WASTEWATER SYSTEM DESIGN STANDARDS," JULY 2017, AND "WASTEWATER SYSTEM STANDARD DETAILS," JULY 2017, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990 AS AMENDED.
2. IN THE EVENT THAT ANY CHANGE IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICT WITH OTHER UTILITIES, THE ENGINEER IN CHARGE OR THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES WHICH ARE TO BE PRESENTED TO THE DEPARTMENT OF PLANNING AND PERMITTING (DPP) FOR APPROVAL.
3. CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED.
4. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS RESEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES, INCLUDING AND AFFECTING SEWER LINES, IN THE PRESENCE OF THE WASTEWATER INSPECTOR AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES.
5. SEWER LATERALS SHALL BE CLEAR OF AND NOT CONFLICTING WITH ANY OTHER UTILITY. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES SHALL BE STRICTLY OBSERVED AND FOLLOWED.
6. SLOPE FOR SEWER LATERALS SHALL BE A MINIMUM OF 2.00%.
7. BUILDING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
9. THE CONSULTING ENGINEER SHALL SUBMIT TO THE WASTEWATER BRANCH, DPP "AS-BUILT" TRACINGS AND ELECTRONIC FILES OF THE CONSTRUCTION PLANS AS ACTUALLY CONSTRUCTED , SHOWING ALL CHANGES FROM THE ORIGINAL PLANS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC NOTIFICATIONS AND PRESS RELEASES.
11. THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.
12. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR ADVANCE SEWER RISER AGREEMENT AT THE DPP AND OBTAIN BUILDING PERMIT FOR PLUMBING WORK BEFORE ANY ADVANCE RISER IS MADE.
13. ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER
14. S4C PIPE CRADLE SEALS SHALL BE INSTALLED 10 FEET FROM ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION.
15. GEOTEXTILE FABRIC TO ENVELOPE THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.
16. CONFINED SPACE
    FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(b), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
    I. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
        a. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
        b. LIFELINE AND ASSOCIATED CLIPS.
        c. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
        d. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
        e. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
        f. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
        g. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
        h. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
    II. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
    III. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
17. WHEN CONNECTING TO A LIVE SEWER LINE, THE CONTRACTOR SHALL ABIDE BY ALL CONDITIONS THAT THE STATE DEPARTMENT OF HEALTH SETS FORTH TO MITIGATE ANY WASTEWATER SPILL THAT MAY OCCUR. THE CONTRACTOR SHALL INFORM THE CITY INSPECTOR FIVE (5) WORKING DAYS PRIOR TO THE ACTUAL CONNECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND PENALTIES DUE TO ANY SPILLS RESULTING FROM THE CONNECTION.
18. NO RUNGS SHALL BE INSTALLED INSIDE NEW SEWER MANHOLES.

SEWER NOTES (CONT.)

19. FOR SEWER MANHOLE ADJUSTMENTS UPWARD LESS THAN 3", SEE STD. DETAIL S-28. FOR SMH ADJUSTMENTS UPWARD GREATER THAN 3" OR FOR ANY ADJUSTMENTS DOWNWARD, RECONSTRUCT SMH TOP FROM BELOW THE CONE SECTION.
20. IF THE CONTRACTOR ENCOUNTERS FLOW MONITORING DEVICES, SUCH AS SPECIAL SEWER MANHOLE COVERS EMBEDDED WITH SOLAR PANELS, CONTACT COLLECTION SYSTEMS MAINTENANCE (CSM), ENV AT 768-7272 TO COORDINATE TEMPORARY REMOVAL.
21. THE CONTRACTOR SHALL MAINTAIN VISIBILITY AND MAINTENANCE ACCESS TO LIVE SEWER MANHOLE LOCATIONS AT ALL TIMES, INCLUDING DURING NON-WORK HOURS AND PAVING OPERATIONS.
22. THE CONTRACTOR SHALL USE A MANHOLE DEBRIS CATCHING DEVICE WHEN PERFORMING MANHOLE HEIGHT ADJUSTMENT WORK AND REMOVE ANY CONSTRUCTION DEBRIS THAT HAS FALLEN INTO THE MANHOLE. DISPOSAL OF CONSTRUCTION DEBRIS IN THE SEWER SYSTEM IS STRICTLY PROHIBITED.
23. FOR PRECAST SEWER MANHOLES, THE CONSULTING ENGINEER SHALL SUBMIT FOUR (4) SETS OF SHOP DRAWINGS TO THE WASTEWATER BRANCH, DPP FOR APPROVAL. AFTER THE SHOP DRAWINGS ARE APPROVED, THE MANUFACTURER SHALL NOTIFY THE CONSTRUCTION MANAGEMENT BRANCH, WASTEWATER ENGINEERING AND CONSTRUCTION DIVISION, ENV, AT 768-8785, 768-8769, OR 768-8755 TO ARRANGE FOR INSPECTION SERVICES FOR CONCRETE POURS MADE AT ITS PLANT SEVEN (7) DAYS PRIOR TO POUR.

CATV NOTES

1. PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST THAT SPECTRUM LOCATE EXISTING DUCTLINE WHEREVER REQUIRED.
2. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. ANY WORK INVOLVING EXISTING CABLES OR DUCTS SHALL BE DONE IN THE PRESENCE OF THE SPECTRUM INSPECTOR OR REPRESENTATIVE. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHEREVER NECESSARY.

WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. NO DEVIATION TO THE BOARD OF WATER SUPPLY 2002 WATER SYSTEM STANDARDS SHALL BE ALLOWED WITHOUT THE MANAGER AND CHIEF ENGINEER'S APPROVAL.
3. ALL PLANS APPROVED BY THE BOARD OF WATER SUPPLY ARE BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY AND/OR IF WORK IS TO BE DONE ON/OR NEAR THE WATER SYSTEM.
4. THE CONTRACTOR SHALL NOTIFY BWS CAPITAL PROJECTS DIVISION, CONSTRUCTION SECTION IN WRITING OR CALL (808) 748-5730 ONE WEEK PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
5. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA, BUT ARE NOT GUARANTEED AS TO THEIR ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL DAMAGES TO EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WATERLINES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ESPECIALLY CAREFUL WHEN EXCAVATING BEHIND WATERLINES, TEES, AND BENDS WHEREVER THERE IS A POSSIBILITY OF WATERLINE MOVEMENT DUE TO THE REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PROTECT THE WATERLINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BOARD OF WATER SUPPLY APPROVAL) AND/OR MODIFYING HIS CONSTRUCTION METHOD.
7. RE-APPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO (2) YEARS.
8. PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL VERIFY IN THE FIELD, THE LOCATION OF EXISTING WATERLINES AND APPURTENANCES.
9. ANY ADJUSTMENTS TO THE EXISTING WATER SYSTEM REQUIRED DURING CONSTRUCTION, TO MEET THE REQUIREMENTS OF THE BOARD OF WATER SUPPLY STANDARDS, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE DONE BY THE CONTRACTOR AT NO COST TO THE BOARD OF WATER SUPPLY.

WATER NOTES (CONT.)

10. THE CONTRACTOR SHALL ADJUST ALL MANHOLE FRAMES/VALVE BOXES/METER BOXES WITHIN THE RECONSTRUCTED/RESURFACED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR "REFERENCING" THESE MANHOLES/VALVE BOXES/METER BOXES TO FACILITATE THE ADJUSTMENTS.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-4, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & Associates, Inc.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS
PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES
NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 4

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED DATE | SUBMITTED BY FIRM MEMBER DATE

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LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

C-005

FILE	POCKET	FOLDER	NO.

HAWAIIAN ELECTRIC COMPANY NOTES

1. **LOCATION OF HAWAIIAN ELECTRIC FACILITIES**

   THE LOCATION OF HAWAIIAN ELECTRIC'S OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATIONS OF THE FACILITIES AND SHALL EXERCISE PROPER CARE IN EXCAVATING AND WORKING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES AND UTILITY CROSSINGS ARE SHOWN, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS AND CROSSINGS TO VERIFY THE DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HAWAIIAN ELECTRIC'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.

2. **COMPLIANCE WITH HAWAII OCCUPATIONAL SAFETY AND HEALTH LAWS**

   THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, THOSE RELATED TO WORKING ON OR NEAR EXPOSED OR ENERGIZED ELECTRICAL LINES AND EQUIPMENT.

3. **EXCAVATION CLEARANCE**

   THE CONTRACTOR SHALL OBTAIN AN EXCAVATION CLEARANCE FROM HAWAIIAN ELECTRIC'S PLANNING AND DESIGN SECTION OF THE TRANSMISSION & DISTRIBUTION ENGINEERING DEPARTMENT (543-5654) LOCATED AT 820 WARD AVENUE, 4TH FLOOR, A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO STARTING CONSTRUCTION.

4. **CAUTION!!! ELECTRICAL HAZARD!!!**

   EXISTING HAWAIIAN ELECTRIC OVERHEAD AND UNDERGROUND LINES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION UNLESS PRIOR SPECIAL ARRANGEMENTS HAVE BEEN MADE WITH HAWAIIAN ELECTRIC. ONLY HAWAIIAN ELECTRIC PERSONNEL ARE TO HANDLE THESE ENERGIZED LINES AND ERECT TEMPORARY GUARDS TO PROTECT THESE LINES FROM DAMAGE. THE CONTRACTOR SHALL WORK CAUTIOUSLY AT ALL TIMES TO AVOID ACCIDENTS AND DAMAGE TO EXISTING HAWAIIAN ELECTRIC FACILITIES, WHICH CAN RESULT IN ELECTROCUTION.

5. **OVERHEAD LINES**

   STATE LAW (OSHA) REQUIRES THAT A WORKER AND THE LONGEST OBJECT HE OR SHE MAY CONTACT CANNOT COME CLOSER THAN A SPECIFIED MINIMUM RADIAL CLEARANCE WHEN WORKING CLOSE TO OR UNDER ANY OVERHEAD LINES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE INFORMED OF AND COMPLY WITH THE LAW.

   AT ANY TIME SHOULD THE CONTRACTOR ANTICIPATE THAT THE WORK WILL RESULT IN THE NEED TO ENCROACH WITHIN THE MINIMUM REQUIRED CLEARANCE AS STATED IN THE LAW, THE CONTRACTOR SHALL NOTIFY HAWAIIAN ELECTRIC AT LEAST THREE (3) MONTHS PRIOR TO THE PLANNED ENCROACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE OR DE-ENERGIZE HAWAIIAN ELECTRIC LINES) CAN BE INVESTIGATED. HAWAIIAN ELECTRIC MAY ALSO BE ABLE TO BLANKET ITS DISTRIBUTION (12KV AND BELOW) LINES TO PROVIDE A VISUAL AID IN PREVENTING ACCIDENTAL CONTACT. HAWAIIAN ELECTRIC'S COST OF SAFEGUARDING OR IDENTIFYING ITS LINES WILL BE CHARGED TO THE CONTRACTOR.

   CONTACT HAWAIIAN ELECTRIC'S CUSTOMER RELATIONS AT 543-7070 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

6. **POLE BRACING**

   a) CONTRACTOR SHALL NOT EXCAVATE WITHIN 10 FEET FROM HAWAIIAN ELECTRIC'S UTILITY POLES OR ANY ANCHOR SYSTEM SUPPORTING THE UTILITY POLE. IF CONTRACTOR MUST EXCAVATE AN AREA MORE THAN 12 INCHES DEEP BY 12 INCHES WIDE, AND CLOSER THAN 10 FEET FROM A UTILITY POLE OR ITS ANCHOR SYSTEM, EXCEPT WHEN EXCAVATING FOR RISERS IN A SINGLE TRENCH NOT WIDER THAN 12 INCHES AND NOT DEEPER THAN 3 FEET, CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING, SUPPORTING, SECURING AND TAKING ALL PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF EXISTING POLES. BEFORE COMMENCING SUCH EXCAVATION, CONTRACTOR MUST NOTIFY HAWAIIAN ELECTRIC WHICH MAY LEAD TO IMPLEMENTING POLE BRACING REQUIREMENTS. HAWAIIAN ELECTRIC REQUIRES A MINIMUM OF TEN (10) WORKING DAYS TO CONDUCT THE REVIEW OF CONTRACTOR'S SUBMITTAL. CONTRACTOR SHALL SUBMIT ITS BRACING CALCULATIONS AND DRAWINGS, PREPARED AND STAMPED BY A LICENSED STRUCTURAL ENGINEER, TO HAWAIIAN ELECTRIC'S CUSTOMER RELATIONS (543-7070) FOR REVIEW. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF THE TEMPORARY POLE BRACING SYSTEM, AS WELL AS ALL COSTS INCURRED BY HAWAIIAN ELECTRIC TO REVIEW CONTRACTOR'S DRAWINGS AND TO REPAIR OR STRAIGHTEN POLES IMPACTED BY CONTRACTOR'S ACTIVITIES, INCLUDING RESPONSE AND RESTORATION COSTS INCURRED BY HAWAIIAN ELECTRIC ARISING OUT OF OR RELATED TO OUTAGES CAUSED BY CONTRACTOR'S FAILURE TO MEET THE FOREGOING REQUIREMENTS. HAWAIIAN ELECTRIC'S RECEIPT OF POLE BRACING CALCULATION OR DRAWING SUBMITTALS OF ANY CONTRACTOR, INCLUDING WORK PROCEDURE, SHALL NOT RELIEVE CONTRACTOR FROM ANY LIABILITY RESULTING FROM CONTRACTOR'S EXCAVATION NEAR OR AROUND HAWAIIAN ELECTRIC'S UTILITY POLES.

HAWAIIAN ELECTRIC COMPANY NOTES (CONT.)

6. **POLE BRACING (CONT.)**

   b) HAWAIIAN ELECTRIC MAY PROVIDE TO THE CUSTOMER INFORMATION RELATED TO POLE BRACING, INCLUDING CALCULATIONS AND OTHER BASIC ENGINEERING. HOWEVER, HAWAIIAN ELECTRIC PROVIDES THIS INFORMATION FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT WARRANT ANY OF THE INFORMATION PROVIDED TO CUSTOMER. HAWAIIAN ELECTRIC HEREBY DISCLAIMS ANY LIABILITY ASSOCIATED WITH THE CUSTOMER'S USE OF INFORMATION PROVIDED TO THE CUSTOMER FROM HAWAIIAN ELECTRIC. IT IS THE CUSTOMER'S DUTY TO OBTAIN ENGINEERING FROM ITS OWN ENGINEER OR CONTRACTOR IN ORDER TO BRACE POLES AND THE USE OF HAWAIIAN ELECTRIC'S INFORMATION DOES NOT EXCUSE THE CUSTOMER FROM PERFORMING ITS OWN EVALUATION OF THE BRACING NEEDS. SHOULD THE CUSTOMER INSTALL BRACING AT ANY POLE LOCATION, CUSTOMER SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS HAWAIIAN ELECTRIC FROM ANY THIRD-PARTY CLAIMS ASSOCIATED WITH THE CUSTOMER'S BRACING OF A POLE. SHOULD THE WORK CUSTOMER PERFORM AT OR NEAR THE POLE LOCATION COMPROMISE THE POLE OR ITS SURROUNDINGS IN ANY WAY, CUSTOMER SHALL RESTORE OR REPLACE THE POLE SO THAT IT IS NO LONGER COMPROMISED.

7. **UNDERGROUND LINES**

   THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES. HAWAIIAN ELECTRIC'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HAWAIIAN ELECTRIC PERSONNEL ARE TO BREAK INTO EXISTING HAWAIIAN ELECTRIC FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HAWAIIAN ELECTRIC'S ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF ITS UNDERGROUND LINES WILL BE CHARGED TO THE CONTRACTOR. FOR ASSISTANCE/COORDINATION IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE LINES, THE CONTRACTOR SHALL CALL HAWAIIAN ELECTRIC'S CUSTOMER RELATIONS AT 543-7070 A MINIMUM OF TEN (10) WORKING DAYS IN ADVANCE.

   SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HAWAIIAN ELECTRIC'S 138KV OR 46KV UNDERGROUND LINES (SEE HAWAIIAN ELECTRIC INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HAWAIIAN ELECTRIC'S UNDERGROUND 138KV AND/OR 46KV LINES" FOR DETAILED REQUIREMENTS).

   FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL THE HAWAII ONE CALL CENTER AT 866-423-7287 MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE.

8. **UNDERGROUND FUEL PIPELINES**

   THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HAWAIIAN ELECTRIC'S UNDERGROUND FUEL OIL PIPELINES. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HAWAIIAN ELECTRIC'S UNDERGROUND FUEL OIL PIPELINES (SEE HAWAIIAN ELECTRIC'S SPECIFIC FUEL PIPELINE "GUIDELINES" TO CONSULTANTS/CONTRACTORS ON EXCAVATION NEAR HAWAIIAN ELECTRIC'S UNDERGROUND FUEL PIPELINES FOR DETAILED REQUIREMENTS).

9. **EXCAVATIONS**

   WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HAWAIIAN ELECTRIC'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR:

   a. ARRANGING FOR HAWAIIAN ELECTRIC STANDBY PERSONNEL TO OBSERVE WORK AT CONTRACTOR'S COST.

   b. SHEETING, BRACING, OR OTHERWISE SUPPORTING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE AND TO PREVENT POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENTS.

   c. PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, UNDER-PINNINGS, OR OTHER NECESSARY METHODS TO FULLY PROTECT IT FROM DAMAGE.

   d. BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DIVISION FOR THERMAL BACKFILL SPECIFICATIONS).

10. **RELOCATIONS OF HAWAIIAN ELECTRIC FACILITIES**

    ANY WORK REQUIRED TO RELOCATE OR MODIFY HAWAIIAN ELECTRIC FACILITIES SHALL BE DONE BY HAWAIIAN ELECTRIC, OR BY THE CONTRACTOR UNDER HAWAIIAN ELECTRIC'S SUPERVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HAWAIIAN ELECTRIC'S WORK, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, STAKING OF POLE/ANCHOR LOCATIONS, IDENTIFYING RIGHT OF WAY AND PROPERTY LINES, EXCAVATION AND BACKFILL, PERMITS AND TRAFFIC CONTROL, BARRICADING, AND RESTORATION OF PAVEMENT, SIDEWALKS, AND OTHER FACILITIES.

    ALL COSTS ASSOCIATED WITH ANY RELOCATION OR MODIFICATION (EITHER TEMPORARY OR PERMANENT) FOR THE CONVENIENCE OF THE CONTRACTOR, OR TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS SHALL BE BORNE BY THE CONTRACTOR.

HAWAIIAN ELECTRIC COMPANY NOTES (CONT.)

11. **CONFLICTS**

    ANY REDESIGN OR RELOCATION OF HAWAIIAN ELECTRIC'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HAWAIIAN ELECTRIC IS NOT RESPONSIBLE FOR ANY DELAY OR DAMAGE THAT MAY ARISE AS A RESULT OF ANY CONFLICTS DISCOVERED OR IDENTIFIED WITH RESPECT TO THE LOCATION OR CONSTRUCTION OF HAWAIIAN ELECTRIC'S ELECTRICAL FACILITIES IN THE FIELD, REGARDLESS OF WHETHER THE CONTRACTOR HAS MET THE REQUESTED MINIMUM ADVANCE NOTICES. IN ORDER TO MINIMIZE ANY DELAY OR IMPACT ARISING FROM SUCH CONFLICTS, HAWAIIAN ELECTRIC SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.

12. **DAMAGE TO HAWAIIAN ELECTRIC FACILITIES**

    THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HAWAIIAN ELECTRIC SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HAWAIIAN ELECTRIC'S FACILITIES AS A RESULT OF HIS OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES OR ANY HAZARDOUS CONDITIONS RELATED TO HAWAIIAN ELECTRIC'S LINES TO HAWAIIAN ELECTRIC'S TROUBLE DISPATCHER AT 548-7961. REPAIR WORK SHALL BE DONE BY HAWAIIAN ELECTRIC OR BY THE CONTRACTOR UNDER HAWAIIAN ELECTRIC'S SUPERVISION. COSTS FOR DAMAGES TO HAWAIIAN ELECTRIC'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

    IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HAWAIIAN ELECTRIC'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HAWAIIAN ELECTRIC'S SECURITY COMMAND CENTER AT 543-7685 (A 24-HOUR NUMBER) SO HAWAIIAN ELECTRIC PERSONNEL CAN SECURE THE DAMAGED SECTION AND REPORT ANY OIL SPILLS TO THE PROPER AUTHORITIES. ALL COSTS ASSOCIATED WITH THE DAMAGE, REPAIR, AND OIL SPILL CLEANUP SHALL BE BORNE BY THE CONTRACTOR.

13. **HAWAIIAN ELECTRIC STAND-BY PERSONNEL**

    THE CONTRACTOR MAY REQUEST HAWAIIAN ELECTRIC TO PROVIDE AN INSPECTOR TO STAND-BY DURING CONSTRUCTION NEAR HAWAIIAN ELECTRIC'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR.

    THE CONTRACTOR SHALL CALL HAWAIIAN ELECTRIC'S CUSTOMER INSTALLATIONS DEPARTMENT AT 543-7070 A MINIMUM OF THREE (3) MONTHS IN ADVANCE TO ARRANGE FOR HAWAIIAN ELECTRIC STAND-BY PERSONNEL.

14. **CLEARANCES**

    THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HAWAIIAN ELECTRIC'S DUCTLINE AND ALL ADJACENT STRUCTURES (CHARTED AND UNCHARTED) IN THE TRENCH:

GUIDELINES FOR MINIMUM HORIZONTAL (PARALLEL) CLEARANCES BETWEEN HAWAIIAN ELECTRIC AND OTHER UNDERGROUND UTILITIES

UNDERGROUND UTILITY	HAWAIIAN ELECTRIC DIRECT BURIED CABLE	HAWAIIAN ELECTRIC DIRECT BURIED IN CONDUIT (NO CONCRETE ENCASEMENT)	HAWAIIAN ELECTRIC 3" (MINIMUM) CONCRETE ENCASEMENT	APPLICABLE NOTES:
HAWAIIAN ELECTRIC DB CONDUITS	12"	3"	0"	
HAWAIIAN ELECTRIC 3" ENCASEMENT	0"	0"	0"	
TELEPHONE/CATV DB	12"	12"	6"	
TELEPHONE/CATV DB DUCTS	12"	12"	6"	
TELEPHONE/CATV 3" ENCASEMENT	0"	0"	0"	5
TRAFFIC SIGNAL	12"	12"	12"	
WATER DB (BWS OWNED)	36"	36"	36"	1,4
CUSTOMER OWNED WATER SERVICE LATERALS	12"	12"	12"	
WATER (CONCRETE JACKETED) (BWS OWNED)	36"	36"	36"	1,4
GAS DB	12"	12"	12"	1
GAS (CONCRETE JACKETED)	12"	12"	12"	1
SEWER DB	36"	36"	36"	1,2
SEWER (CONCRETE JACKETED)	36"	36"	36"	1,2
DRAIN	12"	12"	12"	1
FUEL PIPELINES				3

NOTES:

1. WHERE SPACE IS AVAILABLE, PARALLEL CLEARANCE TO OTHER UTILITIES, OR FOREIGN STRUCTURES OTHER THAN COMMUNICATION OR TRAFFIC SIGNAL SHALL BE 36".
2. IF 36" CLEARANCE CANNOT BE MET:
   - IF CLEARANCE IS LESS THAN 12", JACKET SEWER LINE WITH REINFORCED CONCRETE (PER HAWAIIAN ELECTRIC'S STD. 30-1030) FOR A DISTANCE OF 5' PLUS PIPE DIAMETER.
   - IF CLEARANCE IS BETWEEN 12" AND 36", JACKET SEWER LINE WITH PLAIN CONCRETE
3. ALL FUEL PIPELINE CROSSINGS SHALL BE REVIEWED AND APPROVED BY THE COMPANY THAT OWNS AND MAINTAINS IT.
4. 5 FEET CLEAR TO WATER MAINS 16" AND LARGER.
5. FOR SITUATIONS WITH 0" MINIMUM SEPARATION, A 6" SEPARATION IS RECOMMENDED.
6. CLEARANCES MEASURED FROM OUTER EDGES OR DIAMETERS OF UTILITIES. WHENEVER CONCRETE JACKETS ARE INVOLVED, CLEARANCE SHALL BE TOTAL CLEAR DISTANCE BETWEEN THE CONCRETE JACKET AND UTILITY CONCERNED.

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2-inches : Scale Accordingly)

HAWAIIAN ELECTRIC COMPANY NOTES (CONT.)

14. **CLEARANCES (CONT.)**

GUIDELINES FOR MINIMUM VERTICAL (CROSSING) CLEARANCES HAWAIIAN ELECTRIC AND OTHER UNDERGROUND UTILITIES

UNDERGROUND UTILITY	HAWAIIAN ELECTRIC DIRECT BURIED CABLE	HAWAIIAN ELECTRIC DIRECT BURIED IN CONDUIT (NO CONCRETE ENCASEMENT)	HAWAIIAN ELECTRIC 3" (MINIMUM) CONCRETE ENCASEMENT	APPLICABLE NOTES:
HAWAIIAN ELECTRIC DB CONDUITS	6"	3"	0"	
HAWAIIAN ELECTRIC 3" ENCASEMENT	0"	0"	0"	
TELEPHONE/CATV DB	12"	12"	6"	
TELEPHONE/CATV DB DUCTS	12"	12"	6"	
TELEPHONE/CATV 3" ENCASEMENT	0"	0"	0"	3
TRAFFIC SIGNAL	12"	12"	6"	
WATER DB (BWS OWNED)	12"	12"	12"	5
CUSTOMER OWNED WATER SERVICE LATERALS	6"	6"	6"	
WATER (CONCRETE JACKETED) (BWS OWNED)	12"	12"	12"	5
GAS DB	12"	12"	12"	
GAS (CONCRETE JACKETED)	12"	12"	12"	
SEWER DB	24"	24"	24"	1
SEWER (CONCRETE JACKETED)	24"	24"	24"	1
DRAIN	12"	12"	6"	
FUEL PIPELINES				2

1. IF CLEARANCE CANNOT BE MET:
   - IF CLEARANCE IS LESS THAN 12", JACKET SEWER LINE WITH REINFORCED CONCRETE (PER HAWAIIAN ELECTRIC'S STD. 30-1030) FOR A DISTANCE OF 5' PLUS PIPE DIAMETER.
   - IF CLEARANCE IS BETWEEN 12" AND 24", JACKET SEWER LINE WITH PLAIN CONCRETE.
2. ALL FUEL PIPELINE CROSSINGS SHALL BE REVIEWED AND APPROVED BY THE COMPANY THAT OWNS AND MAINTAINS IT.
3. FOR SITUATIONS WITH 0" MINIMUM SEPARATION, A 6" SEPARATION IS RECOMMENDED.
4. CLEARANCES MEASURED FROM OUTER EDGES OR DIAMETERS OF UTILITIES. WHENEVER CONCRETE JACKETS ARE INVOLVED, CLEARANCE SHALL BE TOTAL CLEAR DISTANCE BETWEEN THE CONCRETE JACKET AND UTILITY CONCERNED.
5. 36" CLEARANCE IS REQUIRED FOR TRENCHLESS INSTALLATION WORK.

THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER & HAWAIIAN ELECTRIC OF ANY HEAT SOURCES (POWER CABLE DUCT BANK, STEAMLINE, ETC.) ENCOUNTERED THAT ARE NOT PROPERLY IDENTIFIED ON THE DRAWING.

15. **INDEMNITY**

    THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HAWAIIAN ELECTRIC FROM AND AGAINST ALL LOSSES, DAMAGES, CLAIMS, AND ACTIONS, INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEY'S FEES AND COSTS BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTION OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY BASED UPON THE SOLE NEGLIGENCE OF HAWAIIAN ELECTRIC.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 5

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

SUBMITTED BY _____ FIRM MEMBER _____ DATE

FILE	POCKET	FOLDER	NO.

MECHANICAL/ELECTRICAL DIVISION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.
2. THE CONTRACTOR SHALL NOTIFY THE MECHANICAL/ELECTRICAL DIVISION, AND DEPARTMENT OF DESIGN AND CONSTRUCTION, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE STREET LIGHTING SYSTEM (PHONE: 768-8431).
3. THE STREET LIGHTING SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION REQUIRED SHALL BE APPROVED BY THE MECHANICAL/ELECTRICAL DIVISION AND PAID FOR BY THE CONTRACTOR.
4. THE LOCATIONS OF THE EXISTING UNDERGROUND STREET LIGHT FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING PLANS AND ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY TO THE EXISTING STREET LIGHT FACILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE EXISTING STREET LIGHTING FACILITIES. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE CITY'S EXISTING COMMUNICATIONS FIBER OPTIC CABLE SYSTEM. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

DRAINAGE NOTES

1. THE CONTRACTOR SHALL PROVIDE AT LEAST SIX(6) INCHES OF VERTICAL CLEARANCE BETWEEN EXISTING DRAIN LINES AND ANY NEWLY CONSTRUCTED TRENCHWORK OR TRAFFIC SIGNAL FOUNDATIONS. ANY DAMAGE INFLICTED UPON EXISTING UTILITY LINES BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE CITY.

CONSTRUCTION NOTES FOR GAS FACILITIES

1. HAWAI'I GAS PIPELINES IN THE PROJECT AREA ARE PLASTIC COATED AND CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR THESE GAS PIPELINES.
2. WRITTEN CLEARANCES MUST BE OBTAINED FROM HAWAI'I GAS, MAPS AND RECORDS DEPARTMENT, 515 KAMAKEE STREET, AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING EXCAVATION NEAR THESE GAS PIPELINES.
3. SINCE GAS LINE LOCATIONS ON FIELD MAPS ARE APPROXIMATE, THE CONTRACTOR, AFTER OBTAINING WRITTEN CLEARANCE, SHALL CALL HAWAII ONE CALL CENTER A MINIMUM OF FIVE (5) WORKING DAYS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF THE EXISTING GAS PIPELINES. THE TELEPHONE NUMBER IS 811 OR 1-866-423-7287.
4. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPELINES IN THE PRESENCE OF A REPRESENTATIVE OF HAWAI'I GAS. ALL BACKFILL WITHIN SIX INCHES OF ANY GAS PIPELINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY HAWAI'I GAS.
5. FOR RELOCATION OF ANY GAS PIPELINE, THE CONTRACTOR SHALL NOTIFY HAWAI'I GAS FIVE (5) WORKING DAYS BEFORE STARTING WORK. THE TELEPHONE NUMBER IS 594-5574. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, OBTAIN TRAFFIC PERMITS, AND RESTORE PAVEMENT, SIDEWALKS, AND OTHER FACILITIES. ANY RELOCATION OF GAS FACILITIES SHALL BE DONE BY HAWAI'I GAS AND PAID FOR BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL NOTIFY HAWAI'I GAS IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPELINES, COATINGS, OR ITS CATHODIC PROTECTION DEVICES. THE TELEPHONE NUMBER IS 535-5933, 24 HOURS A DAY. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO HAWAI'I GAS FACILITIES. REPAIR WORK ON SUCH DAMAGE SHALL BE DONE BY HAWAI'I GAS WITH PAYMENT FOR THIS WORK TO BE BORNE BY THE CONTRACTOR.
7. MINIMUM VERTICAL AND HORIZONTAL CLEARANCE BETWEEN THE GAS PIPELINES AND OTHER PIPELINES, CONDUITS, DUCTLINES, OR OTHER FACILITIES SHALL BE 12 INCHES. ADEQUATE SUPPORT AND PROTECTION FOR GAS PIPELINES EXPOSED IN THE TRENCH SHALL BE PROVIDED BY THE CONTRACTOR AND APPROVED BY HAWAI'I GAS.
8. THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER TO KEEP THE UNCOVERED GAS PIPELINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.

SPECTRUM GENERAL NOTES:

1. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFULL PROSECUTION OF THE WORK.
2. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THESE UTILITIES AS A RESULT OF HIS OPERATIONS. ADJUSTMENTS TO THE NEW DUCTLINE ALIGNMENT, IF REQUIRED, SHALL BE MADE TO PROVIDE THE REQUIRED CLEARANCES.
3. THE CONTRACTOR SHALL BRACE ALL POLES OR LIGHT STANDARDS NEAR THE NEW DUCTLINE, MANHOLE OR HANDHOLE DURING ITS OPERATIONS.
4. THE CONTRACTOR SHALL SAW-CUT A.C. PAVEMENT, CONCRETE GUTTER, AND CONCRETE SIDEWALK WHEREVER NEW MANHOLES, HANDHOLES, PULLBOXES OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.
5. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREAS. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
6. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE COST FOR SUPPLEMENTARY MEASURES, WHICH WILL BE REQUIRED BY THE CITY AND COUNTY, SHALL BE BORNE BY THE CONTRACTOR.
7. PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST THAT OCEANIC CABLE COMPANY TO LOCATE EXISTING DUCTLINE WHEREVER REQUIRED.
8. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. ANY WORK INVOLVING EXISTING CABLES OR DUCTS SHALL BE DONE IN THE PRESENCE OF THE OCEANIC CABLE COMPANY INSPECTOR OR HIS REPRESENTATIVE. TEMPORARY CABLE AND DUCT SUPPORT SHALL BE PROVIDED WHEREVER NECESSARY.
9. THE CONTRACTOR SHALL NOTIFY THE OCEANIC CABLE COMPANY INSPECTOR 72 HOURS PRIOR TO THE START OF WORK ON CATV INFRASTRUCTURE, POURING CONCRETE, OR BACKFILLING. OCEANIC'S INSPECTOR(S): PERRY SAMUELU AT 387-2496 OR PAUL CASPILLO AT 479-1637.
10. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATIONS AND DEPTHS.
11. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND FURNISH ALL LABOR AND EQUIPMENT NECESSARY TO INSTALL THE DUCTLINE IN PLACE COMPLETE.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT ALL REQUIRED LINES AND GRADES AND SHALL PRESERVE ALL BENCH MARKS AND WORKING POINTS NECESSARY TO LAY OUT THE WORK CORRECTLY. THE NEW DUCTLINE SHALL BE ADJUSTED BY THE CONTRACTOR TO SUIT THE EXISTING CONDITIONS AND THE DETAILS AS DESCRIBED IN THE PLANS.
13. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE OF HAWAII, DEPARTMENT OF HEALTH.
14. THE LOCATION OF CATV FACILITIES SHOWN ON PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AS TO ITS ACTUAL FIXED LOCATION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN CLOSE PROXIMITY OF CATV FACILITIES.
15. THE CONTRACTOR SHALL OBTAIN EXCAVATION PERMIT CLEARANCE FROM OCEANIC'S ENGINEERING SECTION LOCATED AT 200 AKAMAINUI ST., MILILANI TECH PARK.
16. FOR ANY FIELD ASSISTANCE OR VERIFICATION OF CATV FACILITIES, THE CONTRACTOR SHALL CALL OCEANIC CABLE AT 625-2100 AND ASK FOR THE OSP ENGINEERING DEPARTMENT.
17. ANY WORK REQUIRED TO RELOCATE CATV FACILITIES SHALL BE DONE BY OCEANIC CABLE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION REQUIREMENTS AND ASSOCIATED COSTS.
18. ANY DAMAGE TO OCEANIC'S FACILITIES SHALL BE REPORTED TO OTWC'S TOC DEPARTMENT AT 625-8169.
19. THE CONTRACTOR SHALL TUNNEL UNDER EXISTING CONCRETE CURB AND GUTTER AS NECESSARY TO EXTEND CONDUIT INTO EXISTING CATV PULLBOX AND INTO THE PROPOSED POWER SUPPLY PULLBOX.

SPECTRUM GENERAL NOTES (CONT.):

20. ALL EXISTING IMPROVEMENTS THAT ARE DISTURBED DURING THE CONSTRUCTION PHASE SHALL BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION AT NO COST TO THE CITY IN ACCORDANCE WITH CITY'S STANDARDS.
21. AT LOCATIONS WHERE EXISTING CATV PULLBOX REPLACEMENT IS PROPOSED, THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTION NOT TO DAMAGE THE EXISTING CABLES IN THE PULLBOX. ALL DAMAGES TO EXISTING CABLES SHALL BE REPAIRED BY OCEANIC CABLE AND PAID FOR BY THE CONTRACTOR.
22. COORDINATE ALL PENETRATION OF TELEPHONE PULLBOXES WITH HAWAIIAN TEL INSPECTOR.
23. SMOOTH FINISH INSIDE WALL OF EXISTING PULLBOXES AND HANDHOLES TO ITS ORIGINAL CONDITION OR BETTER.
24. ALL NEW CONCRETE ENCASED CONDUIT SHALL BE PVC PIPE-SCHEDULE 40. ALL NEW DIRECT-BURIED CONDUIT SHALL BE PVC PIPE-SCHEDULE 80. USE OF ANY OTHER MATERIAL TYPE (GTS, ETC.) SHALL BE LIMITED TO MATCHING EXISTING FACILITIES. CONNECTION OF DISSIMILAR MATERIALS TO REQUIRE APPROVAL FROM OTWC INSPECTOR AND ENGINEERING DEPT.
25. THE CONTRACTOR SHALL PLACE POLY CORD THROUGH OUT PROJECT, AND SECURE IN MANHOLES, HANDHOLES, AND PULLBOXES.
26. FOR 3" CONDUITS OR LARGER, THE CONTRACTOR SHALL INSTALL NEPTCO WP1800 MULETAPE OR APPROVED EQUAL IN ALL DUCTLINES, LEAVE MULETAPE IN PLACE FOR FUTURE USE AS A PULL OR FISH LINE, UNLESS OTHERWISE NOTED. REFERENCE GTE MATERIAL CODE NO. 571154. ALL DUCTS SHALL BE CAPPED TO PREVENT ENTRY OF FOREIGN MATERIAL DURING CONSTRUCTION AND AT COMPLETION OF INSTALLATION. ENDBELLS ARE REQUIRED FOR CONDUITS 2" AND LARGER.
27. PENETRATION INTO PULLBOXES IF NECESSARY TO BE FROM FACTORY INSTALLED OPENING OR FROM BRICKS POSITION. PENETRATION FROM PULLBOX WALLS IS NOT ACCEPTABLE.
28. BENDS IN THE DUCT ALIGNMENT, DUE TO CHANGES IN GRADE SHALL HAVE A MINIMUM RADIUS OF 20-FEET. ALL 90-DEGREE C-BENDS AT A POLE OR AT THE BUILDING FLOOR SLAB PENETRATION, SHALL HAVE A BEND RADIUS OF 10 TIMES THE DIAMETER OF THE DUCT OR GREATER.
29. MINIMUM LENGTH OF CONDUIT USED SHALL NOT BE LESS THAN 5-FEET IN LENGTH. USE OF PARTIAL CONDUIT SECTIONS ALLOWABLE IS AT OTWC INSPECTOR(S) DISCRETION.
30. ALL CONDUITS SHALL ENTER THROUGH THE END "SHORT WALL" OF THE PULL-BOX. ENTRY SHALL BE AT 90 DEGREES (PERPENDICULAR) TO WALL FACE WITH BENDS NO LESS THAN 12" FROM EXTERIOR WALL.
31. A MINIMUM OF (2) PRECAST SECTIONS MUST BE USED ON ALL 2X4 OR 2X6 PULLBOXES.
32. ALL NEW CONSTRUCTION SHALL UTILIZE CONCRETE PRECAST BASE UNLESS OTHERWISE APPROVED OR SPECIFIED BY OTWC INSPECTOR(S).
33. WHEN THREE (3) OR MORE 4" CONDUITS ENTER ONE END WALL OF ANY PULLBOX, ONLY BRICK BASES WILL BE ALLOWED UNLESS OTHERWISE INSTRUCTED/APPROVED BY OTWC INSPECTOR(S).
34. TWO MINIMUM LAYERS OF BRICKS TO BE USED LOWER THAN THE LOWEST DUCT ENTERING THE PULLBOX. TOP LAYER OF BRICK TO BE FLUSH WITH TOP OF CONDUIT OR HIGHER.
35. FOR UPGRADE/REPAIRS TO EXISTING PULL-BOXES, BRICKS MAY BE USED AND SHALL ALWAYS BE AT LEAST TWO LAYERS LOWER THAN THE LOWEST DUCT ENTERING THE PULLBOX.
36. AT NO TIME SHALL CEMENT MORTAR, WOOD, OR ANY OTHER MATERIAL BE USED BETWEEN PRECAST SECTIONS.
37. LEVELING OR RAISING OF BOXES TO GRADE MUST BE DONE:
    A. PRE-CAST BASE(S) - USING GRAVEL LAYER UNDER BASE (TYPE 3B OR EQUIVALENT APPROVED BY OTWC INSPECTOR)
    B. BRICK BASE(S) - ADJUSTMENTS TO BRICKWORK SECTION. THE PERMANENT INSTALLATION OF WOODEN WEDGES TO ACCOMPLISH THIS PURPOSE WILL NOT BE ACCEPTED.
38. 5/8" x 8' COPPER GROUND RODS SHALL BE PLACED IN ALL PULLBOXES UNLESS OTHERWISE DIRECTED BY OCEANIC TIME WARNER CABLE. GROUND RODS WILL BE PLACED IN THE CORNER 3" TO 4" FROM THE WALL AND AWAY FROM ANY CONDUIT WITH NO MORE THAN 8" STICKING UP ABOVE GROUND.
39. TRENCHING TO BE BY HAND DIGGING NEAR AND ACROSS EXISTING UTILITY LINES.

SPECTRUM GENERAL NOTES (CONT.):

40. MINIMUM CLEARANCE BETWEEN STREET LIGHT STAND AND FIRE HYDRANTS SHALL BE THREE FEET.
41. UNDERGROUND UTILITIES SHOWN HEREON IS FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INSTALLATION.
42. FOR UNDERGROUND CABLE LOCATING AND MARKING, FIVE WORKING DAYS ADVANCE NOTICE IS REQUIRED. THREE WORKING DAYS ADVANCE NOTICE IS REQUIRED FOR ANY INSPECTION BY A DESIGNATE REPRESENTATIVE. CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE ANY EXISTING CABLES OR DUCTS. OCEANIC'S INSPECTOR OR DESIGNATED REPRESENTATIVE IS REQUIRED TO BE AT ANY JOB SITE WHENEVER THERE WILL BE A BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAIN OCEANIC'S FACILITIES.
43. CONCRETE STRENGTH SHALL BE 3,000 PSI IN 28 DAYS.
44. CURING AND BACKFILLING. MAINTAIN CONCRETE IN A MOIST CONDITION FOR 24 HOURS MINIMUM FOR 3,000 PSI AND 48 HOURS MINIMUM FOR 2,500 PSI BEFORE COMPACTED.
    BACKFILLING: 72 HOURS MINIMUM BEFORE PERMITTING MOTOR TRAFFIC LOAD ON DUCTLINE. CURING METHOD SHALL MEET OCEANIC TWC INSPECTOR'S APPROVAL.
45. INSTALL 8-MIL. THICK ORANGE COLOR WARNING TAPE 4-INCH WIDE ENTIRE LENGTH OF TRENCH WHEN PLACING CATV CONDUITS. TAPE SHOULD READ "CAUTION BURIED CABLE LINE BELOW".
    MANUFACTURED BY HARRIS INDUSTRIES, INC. CATALOG NUMBER UT-43 OR EQUIVALENT TAPE. TAPE TO BE INSTALLED 12-INCHES BELOW GRADE.
46. AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL WITH A SQUARE FRONT NOT LESS THAN 12-INCH LONG AND HAVING A DIAMETER OF 1/4-INCH LESS THAN THE INSIDE DIAMETER OF DUCT, SHALL BE PULLED THROUGH EACH DUCT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND, OR GRAVEL HAVE BEEN LEFT INSIDE. DUCTS SHALL BE COMPLETELY DRY AND CLEAN.
47. METALLIC ENTRANCE CONDUITS SHALL BE GROUNDED.
48. ALL CONDUITS WITHIN A BUILDING SHALL:
    A. BE INSTALLED IN THE SHORTEST AND STRAIGHTEST POSSIBLE RUN.
    B. HAVE NO SECTION LONGER THAN 100-FEET NOR CONTAIN MORE THAN TWO 90-DEGREE BENDS. AN APPROVED SIZED JUNCTION BOX OR GUTTER BOX SHALL BE PLACED IF THIS IS EXCEEDED.
    C. ALL BENDS SHALL BE LONG SWEEP-RADIUS BENDS BUT THE INSIDE RADIUS OF THE BEND MUST NEVER BE LESS THAN TEN TIMES THE DIAMETER OF THE CONDUIT.
49. ALL CONSTRUCTION MUST BE INSPECTED AND APPROVED BY OCEANIC PRIOR TO THE INSTALLATION OF ANY OF ITS FACILITIES AND THE ENERGIZING OF ITS SYSTEM.
50. CONTRACTOR AND/OR CUSTOMER SHALL PROVIDE OCEANIC WITH SUFFICIENT INSTALLATION TIME IN THEIR OCCUPANCY TIME TABLE.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

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Contractor's Name and Company (printed)
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NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

Signature 4/30/26 expiration date of the license

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES - 6

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED SUBMITTED BY

DATE FIRM MEMBER DATE

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION AND SHALL COMPLY WITH CHAPTER 16-74, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

FILE	POCKET	FOLDER	NO.

HAWAIIAN TELCOM COMMUNICATIONS NOTES

1. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.

2. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT AND TONING REQUEST FROM HAWAIIAN TELCOM'S EXCAVATION PERMIT SECTION, LOCATED AT 1177 BISHOP STREET, TWO WEEKS PRIOR TO THE START OF CONSTRUCTION. HOURS OF BUSINESS ARE 8:00 A.M. TO 11:00 A.M. AND 12:00 P.M. TO 3:30 P.M. MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS.

3. PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST HAWAIIAN TELCOM TO LOCATE EXISTING DUCTLINE WHEREVER REQUIRED. FOR UNDERGROUND CABLE LOCATING AND MARKING, FIVE (5) WORKING DAYS ADVANCE NOTICE IS REQUIRED. THREE (3) WORKING DAYS ADVANCE NOTICE IS REQUIRED FOR ANY INSPECTION BY A DESIGNATED REPRESENTATIVE.

4. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION AND SHALL MAINTAIN PROPER CLEARANCES WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HAWAIIAN TELCOM FACILITIES. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS AND SHALL BE LIABLE FOR ANY DAMAGES TO HAWAIIAN TELCOM FACILITIES. ANY DAMAGES SHALL BE REPORTED IMMEDIATELY TO HAWAIIAN TELCOM'S REPAIR SECTION AT #611 (24 HOURS) OR TO THE EXCAVATION PERMIT SECTION AT 546-7746 (NORMAL WORKING HOURS, MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS). AS A RESULT OF HIS OPERATIONS, ADJUSTMENTS TO THE NEW DUCTLINE ALIGNMENT, IF REQUIRED, SHALL BE MADE TO PROVIDE THE REQUIRED CLEARANCES.

5. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. A HAWAIIAN TELCOM INSPECTOR OR DESIGNATED REPRESENTATIVE IS REQUIRED TO BE AT ANY JOB SITE WHENEVER THERE WILL BE A BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAINS HAWAIIAN TELCOM FACILITIES. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHEREVER NECESSARY.

6. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM'S INSPECTOR OR DESIGNATED REPRESENTATIVE A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION, BRACING, OR BACKFILLING OF HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.

7. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "HAWAIIAN TELCOM STANDARD SPECIFICATIONS FOR PLACING TELEPHONE SYSTEMS" DATED JANUARY 2007, ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, AND ALL OTHER PERTINENT STANDARDS FOR TELEPHONE CONSTRUCTION. CONTRACTOR SHALL FAMILIARIZE THE PERSONNEL BY OBTAINING APPLICABLE SPECIFICATIONS.

8. WHEN EXCAVATION IS ADJACENT TO OR BENEATH HAWAIIAN TELCOM'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL:

   A) SHEET AND/OR BRACE THE EXCAVATION TO PREVENT SLIDES, CAVE-INS, OR SETTLEMENTS TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.

   B) PROTECT EXISTING STRUCTURES AND/OR FACILITIES WITH BEAMS, STRUTS, OR UNDERPINNING WHILE EXCAVATING BENEATH THEM TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.

9. THE CONTRACTOR SHALL BRACE ALL POLES OR LIGHT STANDARDS NEAR THE NEW DUCTLINE, MANHOLE, OR HANDHOLE DURING HIS OPERATIONS.

10. THE CONTRACTOR SHALL SAW-CUT A.C. PAVEMENT AND CONCRETE GUTTER WHEREVER NEW MANHOLES, HANDHOLES, OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.

11. THE CONTRACTOR SHALL COMPLY WITH THE POLICY ADOPTED BY THE DEPARTMENT OF PLANNING AND PERMITTING, CITY AND COUNTY OF HONOLULU, CONCERNING THE REPLACEMENT OF CONCRETE SIDEWALKS AFTER EXCAVATION WORK.

HAWAIIAN TELCOM COMMUNICATIONS NOTES (CONT.)

12. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

13. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATIONS AND DEPTHS.

14. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE COST FOR SUPPLEMENTARY MEASURES, WHICH WILL BE REQUIRED BY THE CITY AND COUNTY, SHALL BE BORNE BY THE CONTRACTOR.

15. THE CONTRACTOR SHALL PUMP ALL MANHOLES DRY DURING FINAL INSPECTION.

16. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM INSPECTOR 24 HOURS PRIOR TO THE POURING OF CONCRETE OR BACKFILLING.

17. WHEN CONNECTING TO MANHOLE WALLS, ALL EXISTING REINFORCING BARS SHALL BE LEFT INTACT. DUCTS SHALL BE ADJUSTED IN THE FIELD IN ORDER TO CLEAR REINFORCING.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT ALL REQUIRED LINES AND GRADES AND SHALL PRESERVE ALL BENCH MARKS AND WORKING POINTS NECESSARY TO LAY OUT THE WORK CORRECTLY. THE NEW DUCTLINE SHALL BE ADJUSTED BY THE CONTRACTOR TO SUIT THE EXISTING CONDITIONS AND THE DETAILS AS DESCRIBED IN THE PLANS.

19. MINIMUM CONCRETE STRENGTH SHALL BE:
    FOR DUCTLINE 2500 PSI AT 28 DAYS
    FOR MANHOLE 3000 PSI AT 28 DAYS OR AS SPECIFIED IN DESIGN NOTE.

20. BENDS IN THE DUCT ALIGNMENT, DUE TO CHANGES IN GRADE SHALL HAVE A MINIMUM RADIUS OF 25 FEET. ALL 90 DEGREE C-BENDS AT A POLE OR AT THE BUILDING FLOOR SLAB PENETRATION, SHALL HAVE A BEND RADIUS OF TEN TIMES THE DIAMETER OF THE DUCT OR GREATER.

21. AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL WITH A SQUARE FRONT NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF ¼" LESS THAN THE INSIDE DIAMETER OF THE DUCT, SHALL BE PULLED THROUGH EACH DUCT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND, OR GRAVEL HAVE BEEN LEFT INSIDE. DUCTS SHALL BE COMPLETELY DRY AND CLEAN.

22. ALL DUCTS AND CONDUITS SHALL HAVE AN 1800# POLYESTER MULE-TAPE (NEPTCO, WP1800P, HAWAIIAN TELECOM MATERIAL CODE NO. 571154) INSTALLED THROUGHOUT ITS ENTIRE LENGTH. ALL DUCTS SHALL BE CAPPED TO PREVENT ENTRY OF FOREIGN MATERIAL DURING CONSTRUCTION AND AT THE COMPLETION OF INSTALLATION.

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

CONSTRUCTION NOTES – 7

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

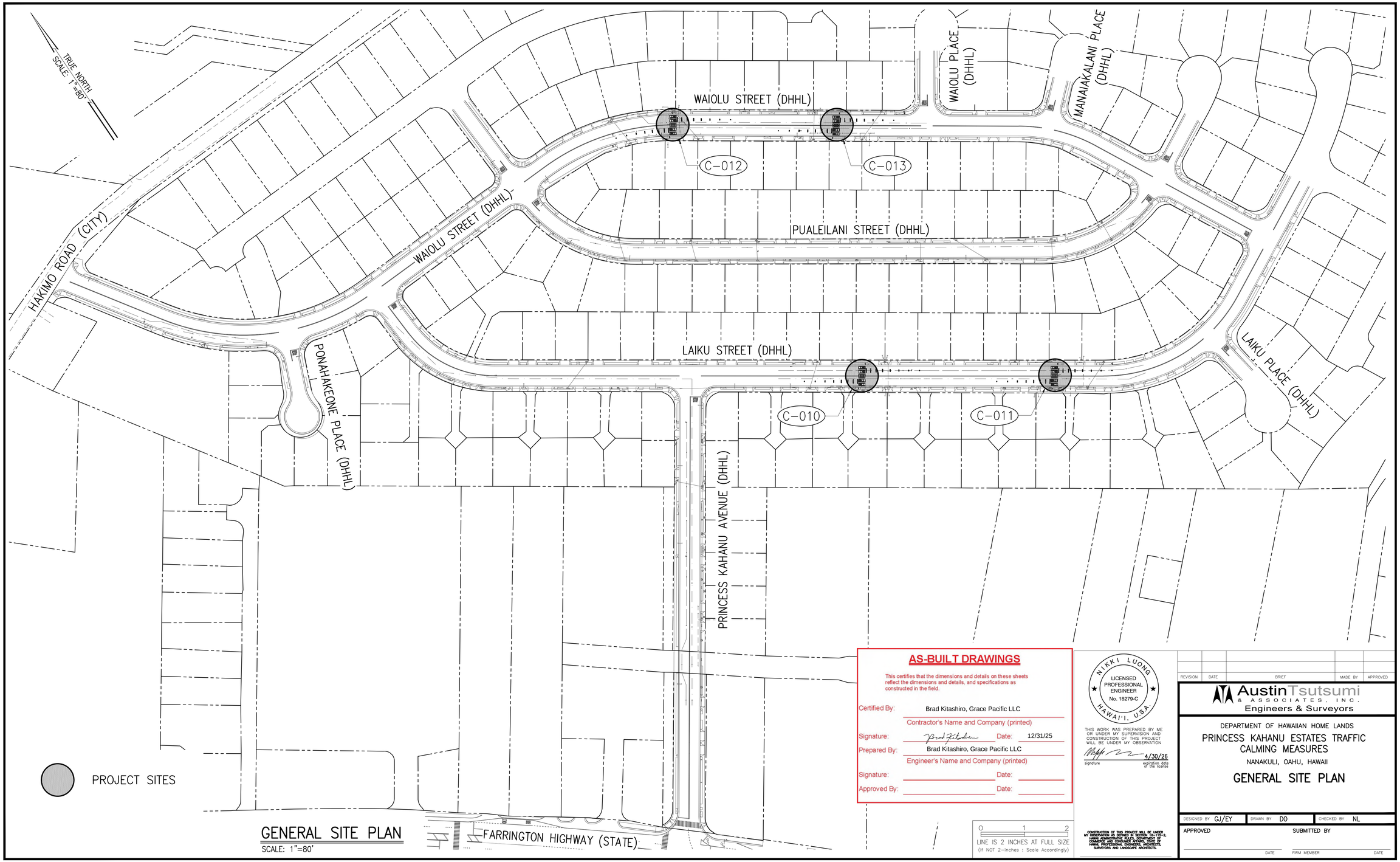
SUBMITTED BY _____ FIRM MEMBER DATE

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

C-008

SHEET 9 OF 26

FILE	POCKET	FOLDER	NO.



GENERAL SITE PLAN
SCALE: 1"=80'

AS-BUILT DRAWINGS

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Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-4, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERING, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

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signature 4/30/26 expiration date of the license

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

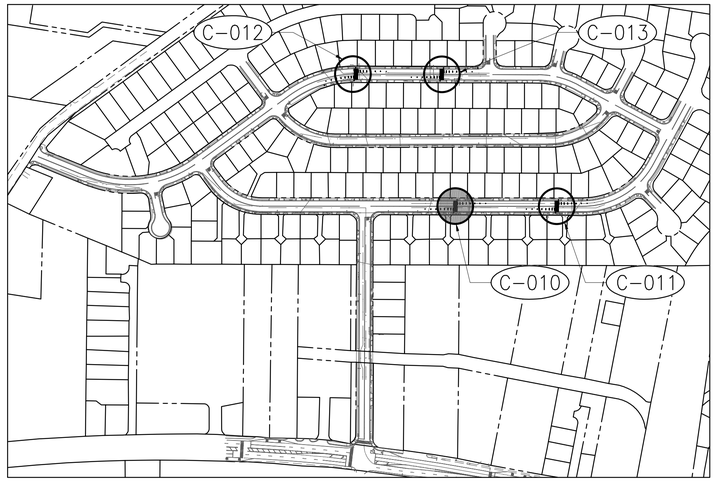
GENERAL SITE PLAN

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

SUBMITTED BY _____ FIRM MEMBER _____ DATE

FILE	POCKET	FOLDER	NO.



KEY MAP
SCALE: 1"=250'

TRUE NORTH
SCALE: 1"=10'

TMK (1): 8-7-042: 140

TMK (1): 8-7-042: 139

TMK (1): 8-7-042: 138

TMK (1): 8-7-043: 116

TMK (1): 8-7-043: 115

INSTALL NEW SIGN ON NEW POST

SPEED HUMP

W17-1
30"x30"

47.0'

12.0'

5.0'

LAIKU STREET (DHHL)

SPEED HUMP 6' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

SPEED HUMP 5' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

12" WHITE PAVEMENT SPEED HUMP ADVANCE WARNING MARKINGS.
SEE DWG. C-014 FOR DETAIL, TYP.

1'-8"
5.0'
2.0'
6.0'
2.0'
6.0'
1'-10"
6.0'
2.0'
5.0'

REMOVE EXIST. SIGN ON EXIST. STREET LIGHT STANDARD AND INSTALL NEW SIGNS ON EXIST. STREET LIGHT STANDARD.

SPEED LIMIT 25

SPEED HUMP

W17-1
30"x30"

15 MPH

W13-1P
18"x18"

TMK (1): 8-7-042: 071

TMK (1): 8-7-042: 070

TMK (1): 8-7-042: 153

TMK (1): 8-7-042: 06

7.0'

12.0'

8.0'

INSTALL NEW SIGN ON NEW POST

SPEED HUMP

W17-1
30"x30"

SPEED HUMP – 1
SCALE: 1"=10'

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

0 1 2
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(If NOT 2-inches : Scale Accordingly)

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

SPEED HUMP – 1
LAIKU STREET

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

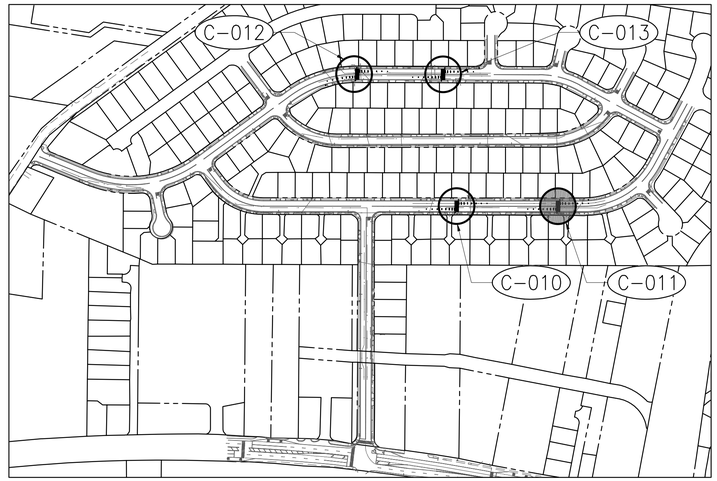
SUBMITTED BY _____ FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

C-010

SHEET 11 OF 26

TRUE NORTH
SCALE: 1"=10'



NORTH

KEY MAP
SCALE: 1"=250'

TMK (1): 8-7-043: 113

TMK (1): 8-7-043: 112

INSTALL NEW SIGN
ON NEW POST
SPEED HUMP
W17-1
30"x30"

TMK (1): 8-7-043: 111

INSTALL NEW SIGNS
ON NEW POST
SPEED HUMP
W17-1
30"x30"
15 MPH
W13-1P
18"x18"

TMK (1): 8-7-043: 110

TMK (1): 8-7-043: 109

40.0'
12.0'
8.0'
100.0'
4.5'
2.0'

SPEED HUMP 6' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

SPEED HUMP 5' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

5.0'
6.0'
2.0'

LAIKU STREET (DHHL)

12" WHITE PAVEMENT SPEED HUMP
ADVANCE WARNING MARKINGS.
SEE DWG. C-014 FOR DETAIL, TYP.

5.5'
3.0'
12.0'
11'-7"

INSTALL NEW SIGN
ON NEW POST
SPEED HUMP
W17-1
30"x30"

TMK (1): 8-7-043: 119

TMK (1): 8-7-043: 075

TMK (1): 8-7-043: 074

TMK (1): 8-7-043: 118

TMK (1): 8-7-0

SPEED HUMP – 2
SCALE: 1"=10'

AS-BUILT DRAWINGS

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Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

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signature
4/30/26
expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

Austin Tsutsumi & Associates, Inc.
Engineers & Surveyors

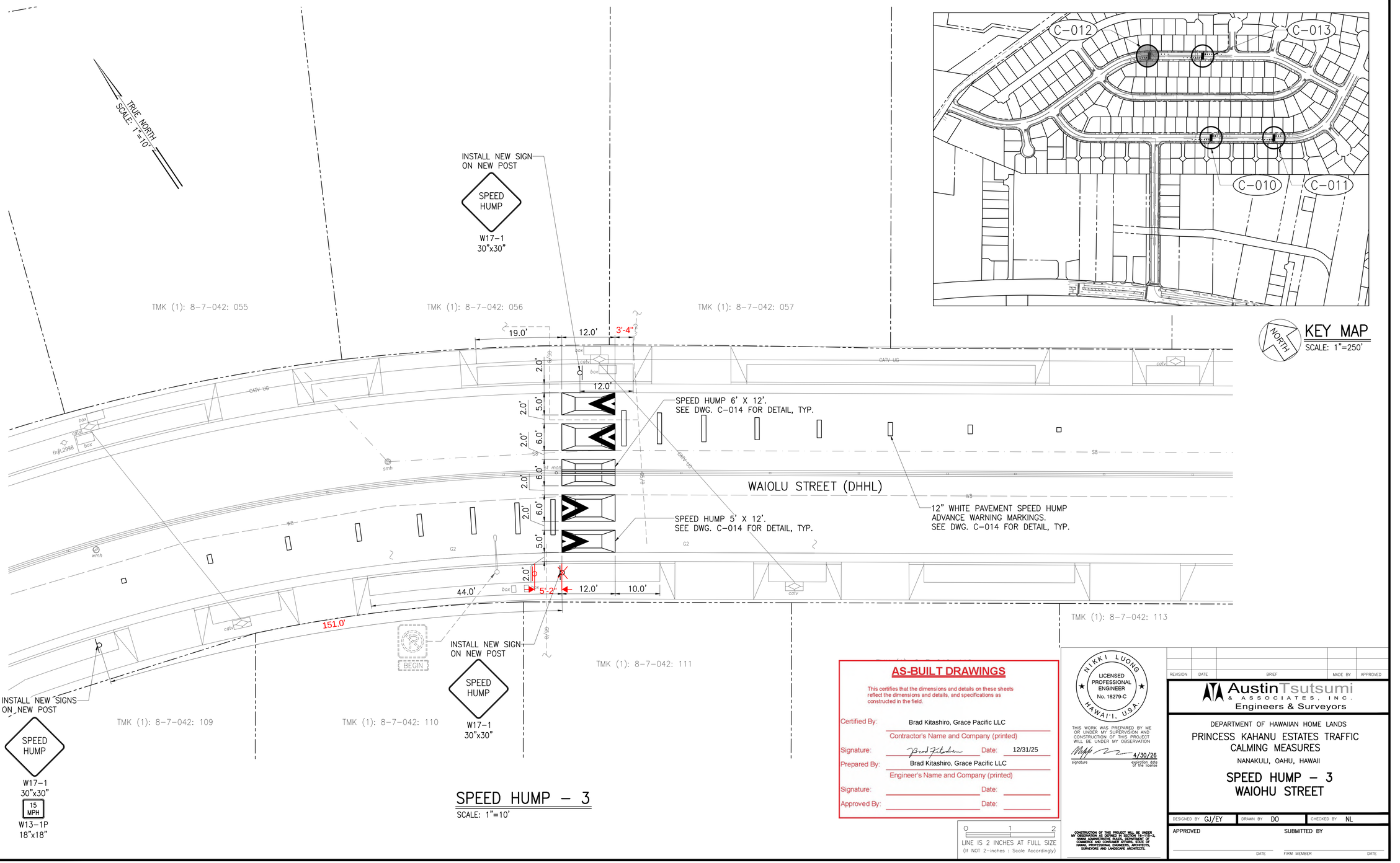
DEPARTMENT OF HAWAIIAN HOME LANDS
PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES
NANAKULI, OAHU, HAWAII

SPEED HUMP – 2
LAIKU STREET

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED
SUBMITTED BY
DATE
FIRM MEMBER
DATE

FILE	POCKET	FOLDER	NO.



KEY MAP
SCALE: 1"=250'

SPEED HUMP – 3
SCALE: 1"=10'

AS-BUILT DRAWINGS

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Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

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0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS
PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES
NANAKULI, OAHU, HAWAII

SPEED HUMP – 3
WAIOHU STREET

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED DATE
SUBMITTED BY FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

TRUE NORTH
SCALE: 1"=10'

INSTALL NEW SIGN
ON NEW POST

SPEED
HUMP

W17-1
30"x30"

REMOVE EXIST. SIGN
AND EXIST. POST

SPEED
LIMIT
25

TMK (1): 8-7-042: 060

TMK (1): 8-7-042: 061

TMK (1): 8-7-042: 062

TMK (1): 8-7-042: 063

110.0'

18'-8"

9.0'

12.0'

3'-4"

2.0'

CATV UG

box

catv

cb

sdmh

smh

S8

W3

G2

th#L5572

WAIOLU STREET (DHHL)

SPEED HUMP 6' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

SPEED HUMP 5' X 12'.
SEE DWG. C-014 FOR DETAIL, TYP.

12" WHITE PAVEMENT SPEED HUMP
ADVANCE WARNING MARKINGS.
SEE DWG. C-014 FOR DETAIL, TYP.

2.0'
5.0'
6.0'
2.0'
6.0'
2.0'
6.0'
2.0'
5.0'
2.0'

INSTALL NEW SIGNS
ON NEW POST

SPEED
HUMP

W17-1
30"x30"

15
MPH

W13-1P
18"x18"

REMOVE EXIST. SIGN
ON EXIST. STREET
LIGHT STANDARD

SPEED
LIMIT
25

39.0'

12.0'

9.0'

TMK (1): 8-7-042: 114

TMK (1): 8-7-042: 115

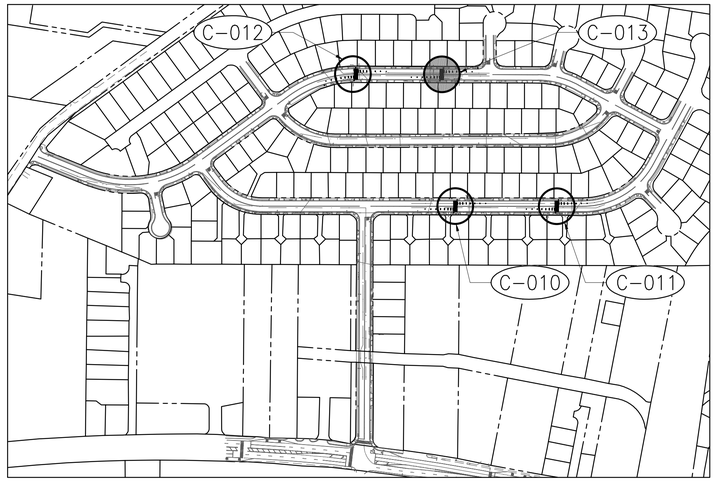
TMK (1): 8-7-042: 116

INSTALL NEW SIGN
ON NEW POST

SPEED
HUMP

W17-1
30"x30"

SPEED HUMP – 4
SCALE: 1"=10'



WAIOLU ST
WAIOLU PL

WAIOLU PLACE
(DHHL)

NORTH

KEY MAP
SCALE: 1"=250'

AS-BUILT DRAWINGS

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Signature: Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: Date:
Approved By: Date:

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(if NOT 2-inches : Scale Accordingly)

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REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

SPEED HUMP – 4
WAIOHU STREET

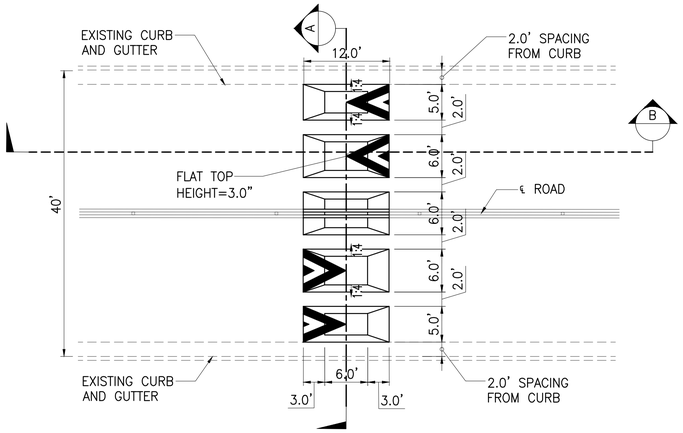
DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED DATE

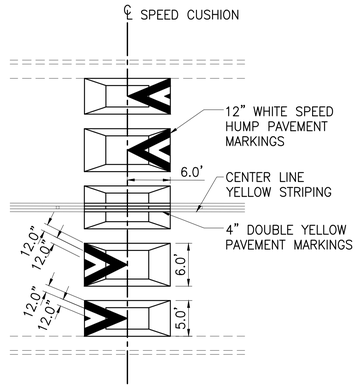
SUBMITTED BY
FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

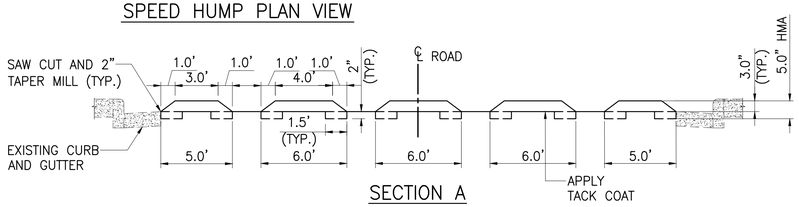
C-013



SPEED HUMP PLAN VIEW



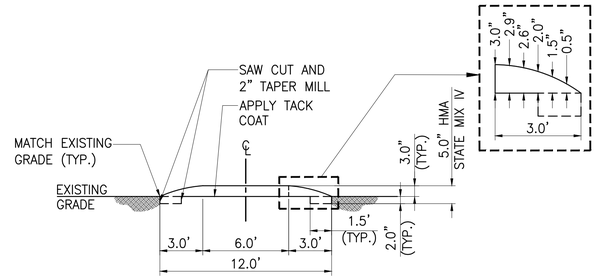
SPEED HUMP MARKINGS



SECTION A

SPEED HUMP DETAILS FOR ROADWAY WIDTH OF 40'

NOT TO SCALE



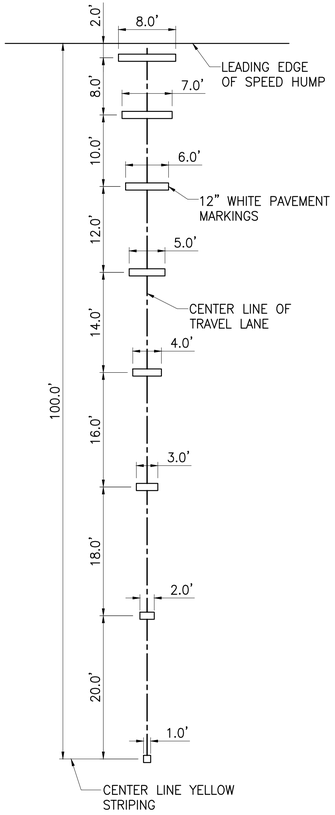
SECTION B

TYPICAL A.C. SPEED HUMP SECTION DETAIL

NOT TO SCALE

SPEED CUSHION AND SPEED HUMP NOTES:

1. ALL SIGNING AND STRIPING SHALL CONFORM TO THE LATEST EDITION OF THE MUTCD.
2. SPEED CUSHIONS AND SPEED HUMPS SHALL NOT BE PLACED FRONTING DRIVEWAYS AND CURB RAMPS OR OVER UTILITY BOXES, MONUMENTS, AND GUTTERS.



SPEED HUMP ADVANCE WARNING MARKING

NOT TO SCALE

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: Brad Kitashiro Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

0 1 2
LINE IS 2 INCHES AT FULL SIZE
(If NOT 2-inches : Scale Accordingly)

NIKKI LUONG
LICENSED PROFESSIONAL ENGINEER
No. 18279-C
HAWAI'I, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

signature 4/30/26 expiration date of the license

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN SECTION 16-115-2, HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS

PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES

NANAKULI, OAHU, HAWAII

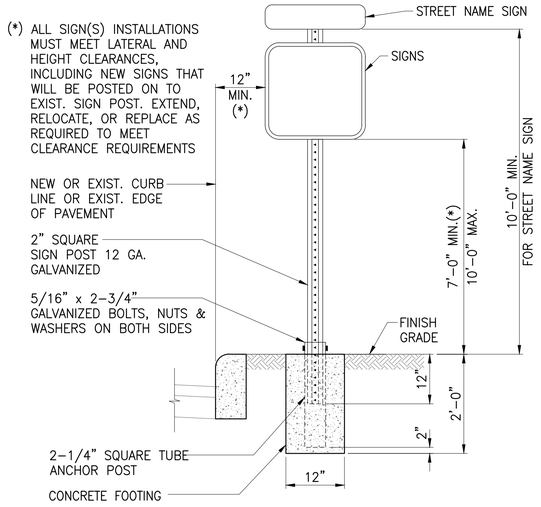
MISCELLANEOUS DETAILS – 1

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE

SUBMITTED BY _____ FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

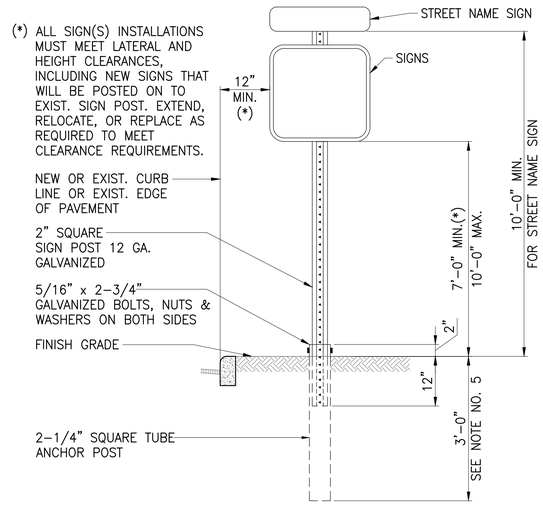


ANCHOR POST NOTES:

1. INSTALLATION OF NEW OR RELOCATED SIGN POST WITH CONCRETE FOOTING SHALL BE APPROVED BY THE OFFICER-IN-CHARGE.
2. KEEP INSIDE OF 2-1/4" ANCHOR POST FREE FROM IMPEDIMENTS THAT MAY PREVENT PROPER SEATING OF 2" SIGN POST.
3. SQUARE TUBING SIGN POST SHALL BE TELESCOPING TYPE WITH 7/16" DIA. HOLES AT 1" O.C. ON FOUR SIDES.
4. USE 5/16" x 2-3/4" BOLTS TO SECURE THE SQUARE TUBING POST ONTO THE 2-1/4" SQUARE TUBE ANCHOR POST.

INSTALLATION OF NEW OR RELOCATED SIGN POST WITH CONCRETE FOOTING

NOT TO SCALE



ANCHOR POST NOTES:

1. KEEP INSIDE OF 2-1/4" ANCHOR POST FREE FROM IMPEDIMENTS THAT MAY PREVENT PROPER SEATING OF 2" SIGN POST.
2. SQUARE TUBING SIGN POST SHALL BE TELESCOPING TYPE WITH 7/16" DIA. HOLES AT 1" O.C. ON FOUR SIDES.
3. USE 5/16" x 2-3/4" BOLTS TO SECURE THE SQUARE TUBING POST ONTO THE 2-1/4" SQUARE TUBE ANCHOR POST.
4. MINIMUM BURY DEPTH FOR THE 2-1/4" ANCHOR POST SHALL BE AS FOLLOWS:
   4'-0" MIN. AT POOR SOIL CONDITIONS
   2'-6" MIN. AT ROCKY CONDITIONS.

INSTALLATION OF NEW OR RELOCATED SIGN POST WITH ANCHOR POST, WITHOUT CONCRETE FOOTING

NOT TO SCALE

AS-BUILT DRAWINGS

This certifies that the dimensions and details on these sheets reflect the dimensions and details, and specifications as constructed in the field.

Certified By: Brad Kitashiro, Grace Pacific LLC
Contractor's Name and Company (printed)
Signature: _____ Date: 12/31/25
Prepared By: Brad Kitashiro, Grace Pacific LLC
Engineer's Name and Company (printed)
Signature: _____ Date: _____
Approved By: _____ Date: _____

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LINE IS 2 INCHES AT FULL SIZE
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REVISION	DATE	BRIEF	MADE BY	APPROVED

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DEPARTMENT OF HAWAIIAN HOME LANDS
PRINCESS KAHANU ESTATES TRAFFIC CALMING MEASURES
NANAKULI, OAHU, HAWAII

MISCELLANEOUS DETAILS – 2

DESIGNED BY	DRAWN BY	CHECKED BY
GJ/EY	DO	NL

APPROVED _____ DATE
SUBMITTED BY _____ FIRM MEMBER DATE

FILE	POCKET	FOLDER	NO.

C-015

Honolulu Sewer Utilities

City & County of Honolulu

SELECT LAYER TO SEARC

Legend

Utilities - Stormwater Structure

- Catch Basin
- Man Hole
- Grate/Drain Inlet
- Inlet/Outlet
- Other
- Unknown
- Other

Utilities - Stormwater Conduit

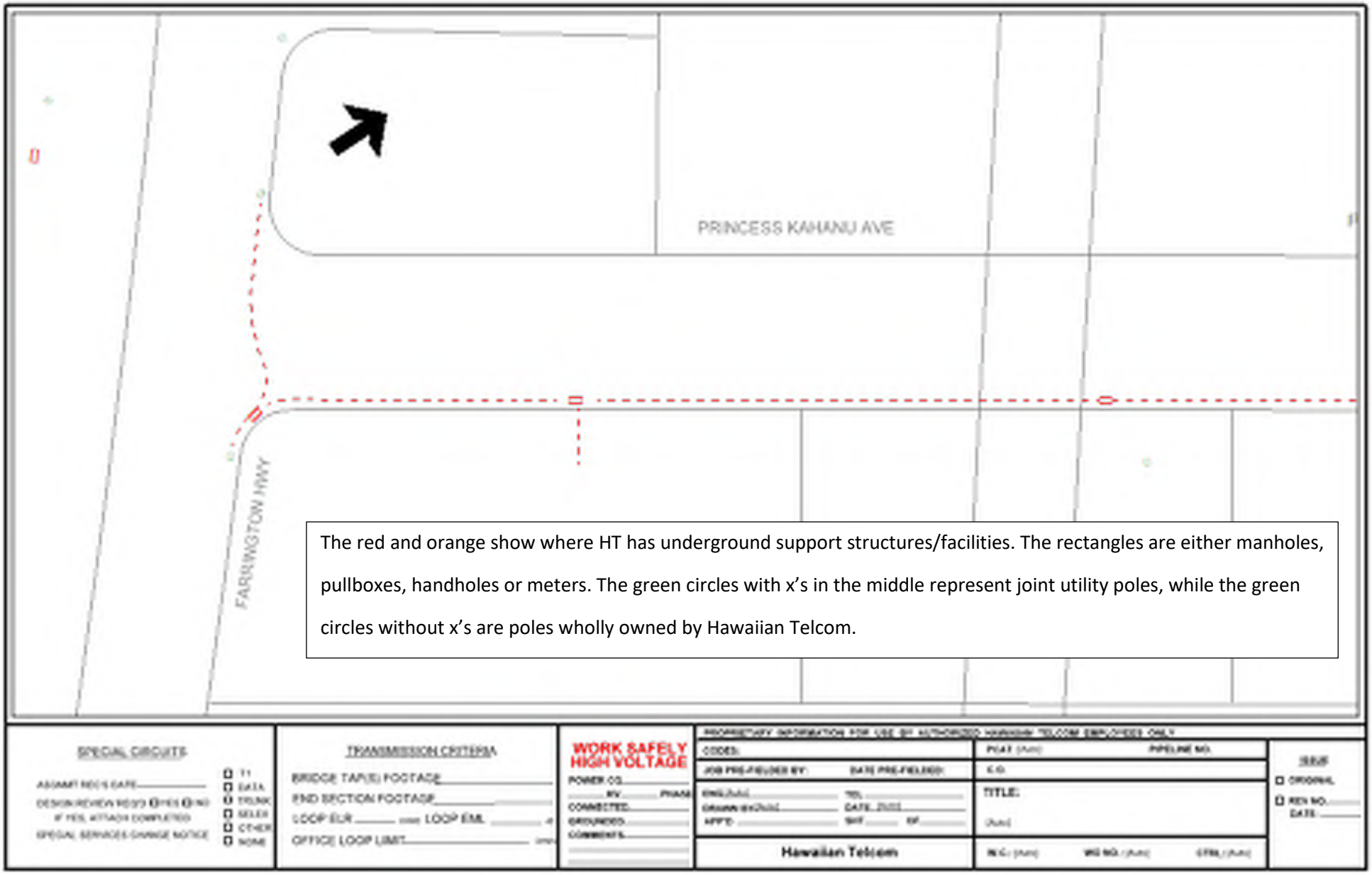
- Reinforced Concrete Pipe
- Box Culvert
- Ditch
- Channel
- Other
- Unknown
- Swale
- Corrugated Metal Pipe
- Arch Pipe
- Prefabricated Bend
- Other

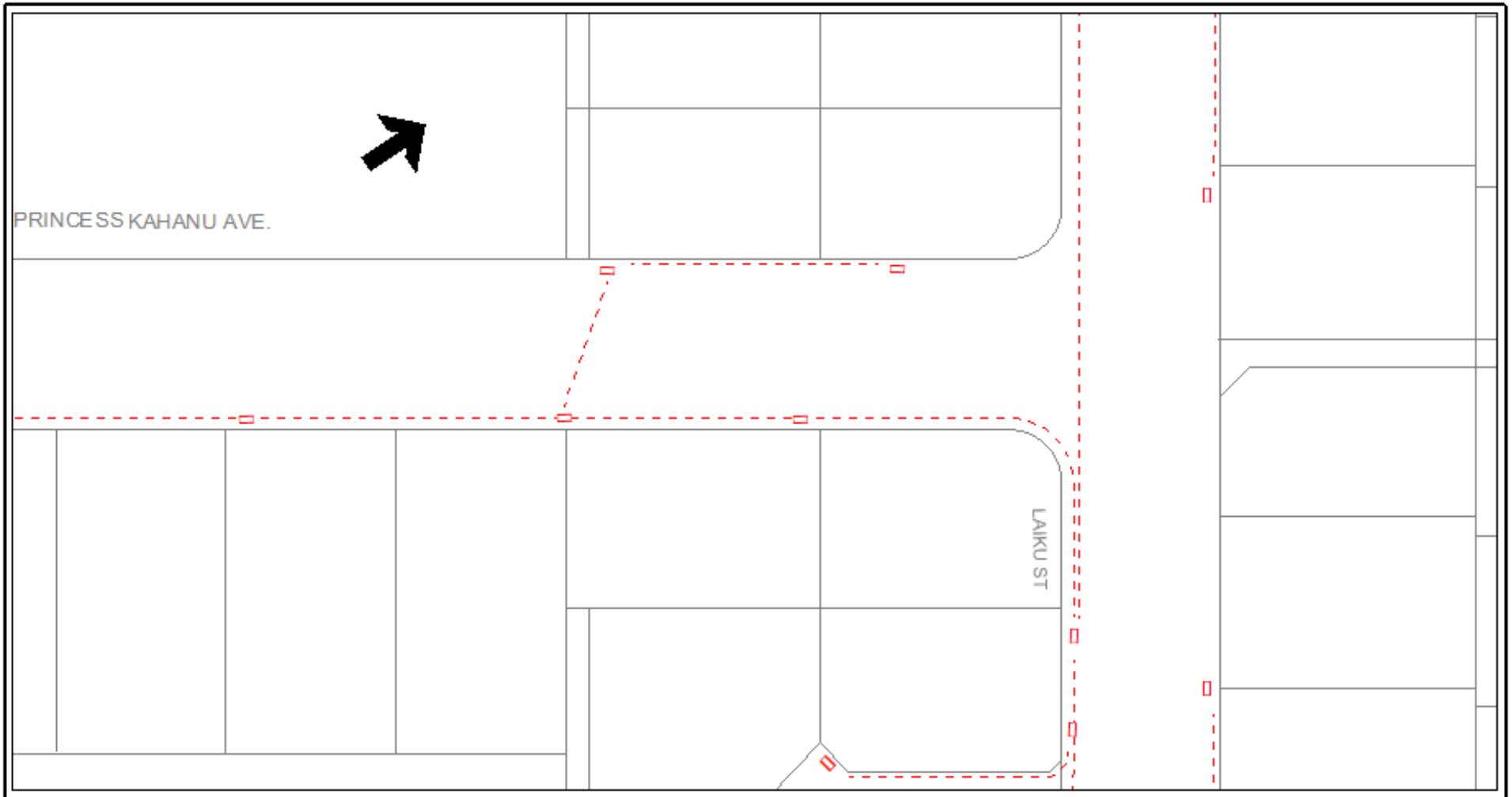
Utilities - Stormwater Polygon

City and County of Honolulu, Esri, HERE, Garmin, USGS, EPA, USDA | Honolulu

400ft

-158.149 21.401 Degrees


PRINCESS KAHANU AVE
FARRINGTON HWY
The red and orange show where HT has underground support structures/facilities. The rectangles are either manholes, pullboxes, handholes or meters. The green circles with x's in the middle represent joint utility poles, while the green circles without x's are poles wholly owned by Hawaiian Telcom.
SPECIAL CIRCUITS
TRANSMISSION CRITERIA
WORK SAFELY
HIGH VOLTAGE
Hawaiian Telcom



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

BRIDGE TAP(S) FOOTAGE_____

END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY HIGH VOLTAGE

POWER CO._____

_____KV_____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

PROPRIETARY INFORMATION FOR USE BY AUTHORIZED HAWAIIAN TELCOM EMPLOYEES ONLY

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DRAWN BY:[Auto] DATE [Auto]

APP'D _____ SHT_____ OF_____

TITLE:

[Auto]

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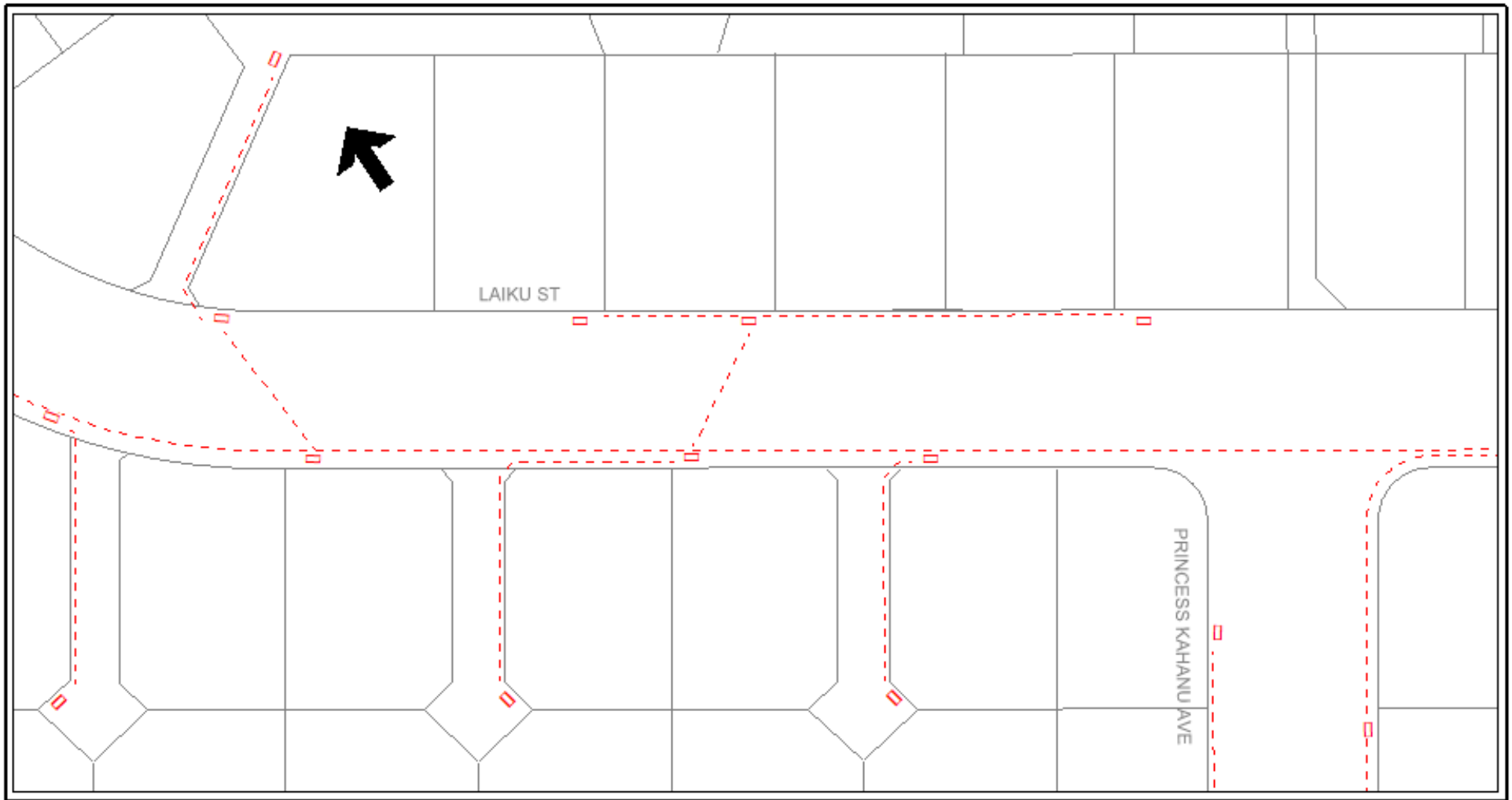
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ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

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☐ T1
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☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

BRIDGE TAP(S) FOOTAGE_____

END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY HIGH VOLTAGE

POWER CO._____

_____KV_____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

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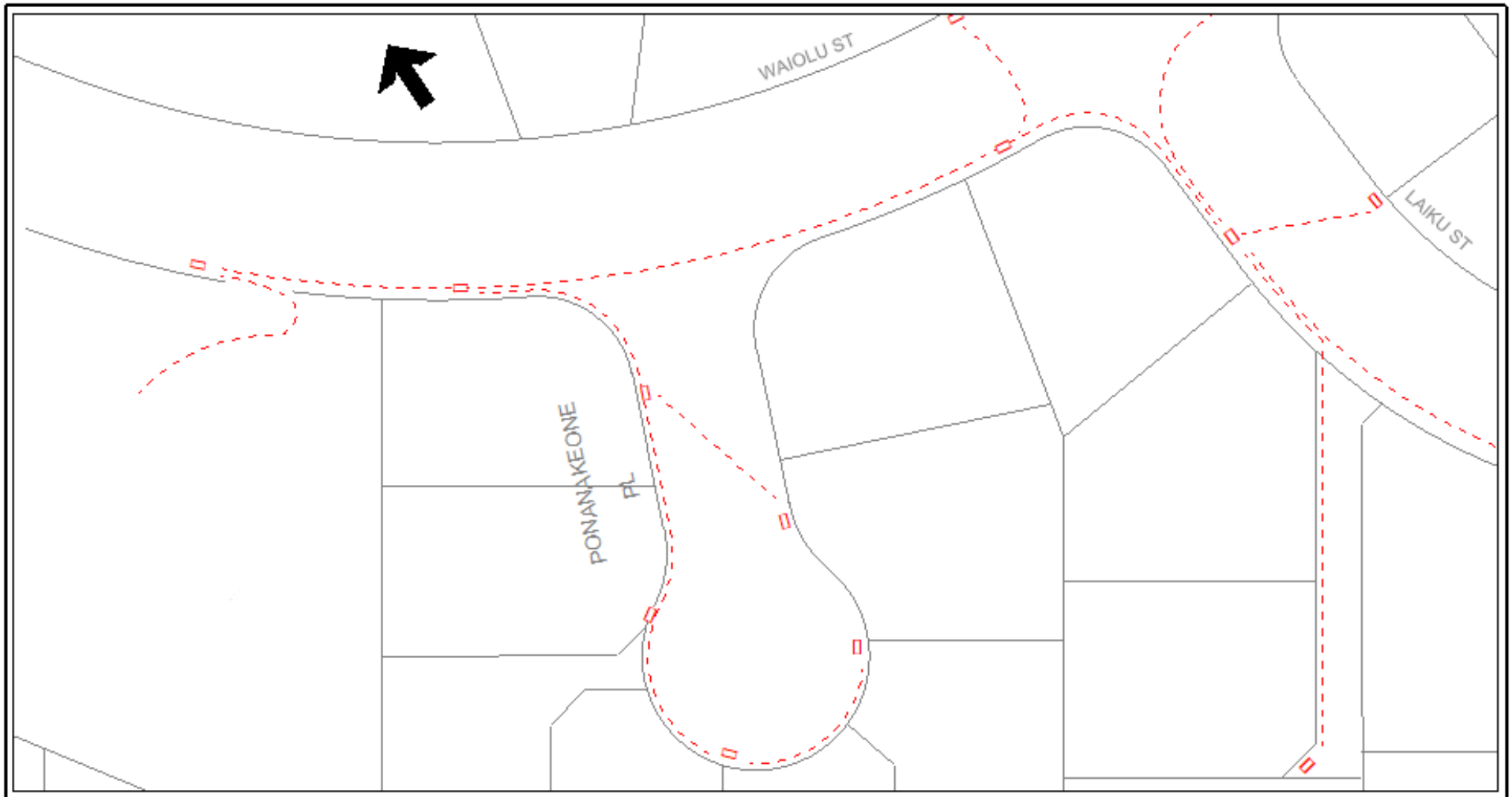
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ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

BRIDGE TAP(S) FOOTAGE_____

END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY HIGH VOLTAGE

POWER CO._____

_____KV_____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

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JOB PRE-FIELDED BY: DATE PRE-FIELDED:	C.O.	
ENG.[Auto] TEL	TITLE:	
DRAWN BY[Auto] DATE [Auto]		
APP'D SHT OF	[Auto]	
Hawaiian Telcom	W.C.: [Auto] WO NO.: [Auto]	CTRL: [Auto]

ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASSMT REC'S DATE:

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

BRIDGE TAP(S) FOOTAGE

END SECTION FOOTAGE

LOOP CUR LOOP EMF

OFFICE LOOP LIMIT

WORK SAFELY HIGH VOLTAGE

POWER CO.

KV PHASE

CONNECTED:

GROUNDED:

COMMENTS:

PROPRIETARY INFORMATION FOR USE BY AUTHORIZED HAWAIIAN TELCOM EMPLOYEES ONLY

CODEN:

PCAT [Auto]

PIPELINE NO.

JOB PRE-FIELDED BY:

DATE PRE-FIELDED:

C.O.

ENG [Auto]

TEL

DRAWN BY [Auto]

DATE [Auto]

TITLE:

[Auto]

APP'D

SHT OF

Hawaiian Telcom

W.C. [Auto]

WO NO. [Auto]

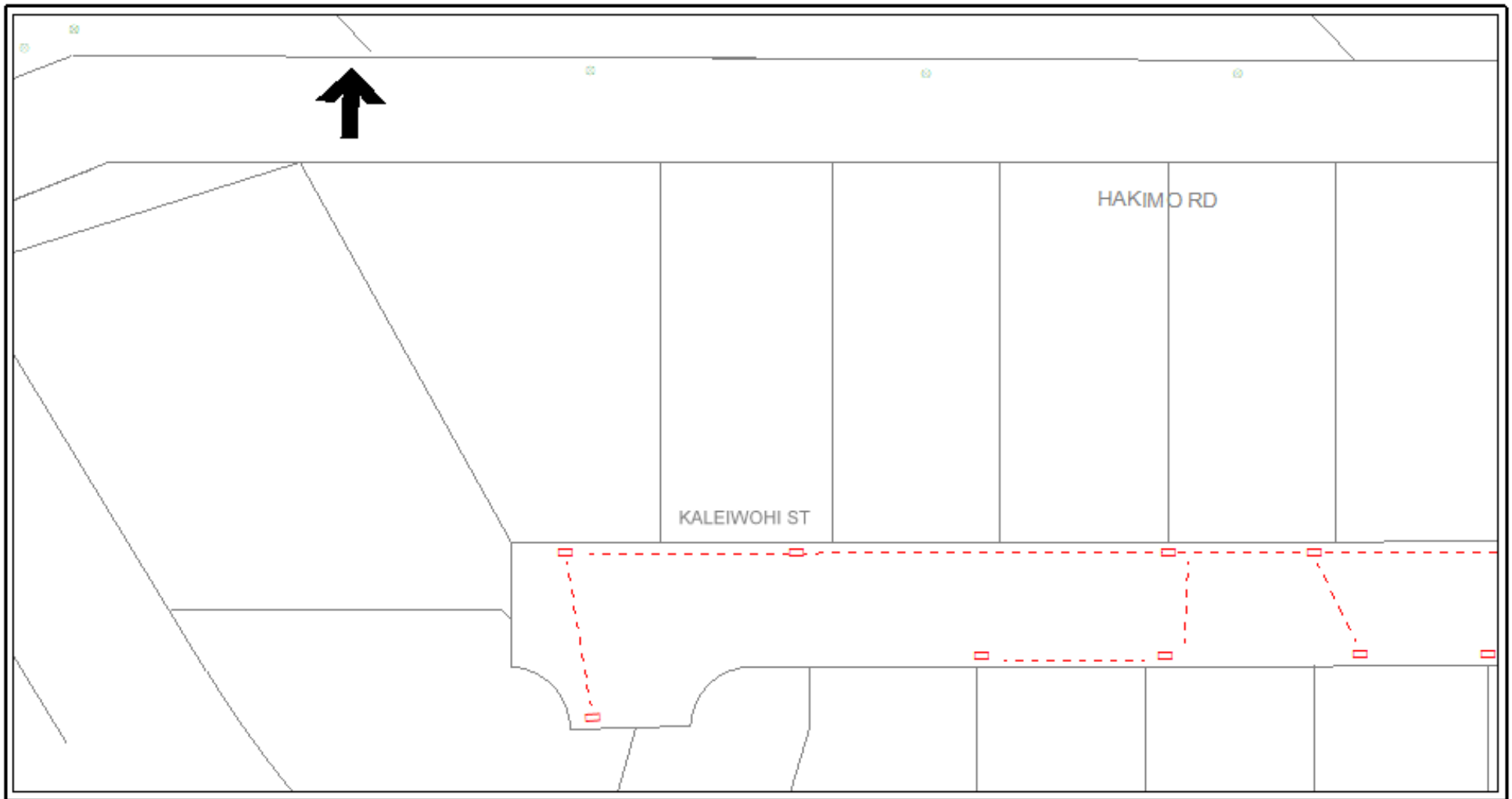
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ISSUE

☐ ORIGINAL

☐ REV NO.

DATE



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

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☐ T1
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☐ OTHER
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TRANSMISSION CRITERIA

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ENG.[Auto] TEL	TITLE:	
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SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

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TITLE:

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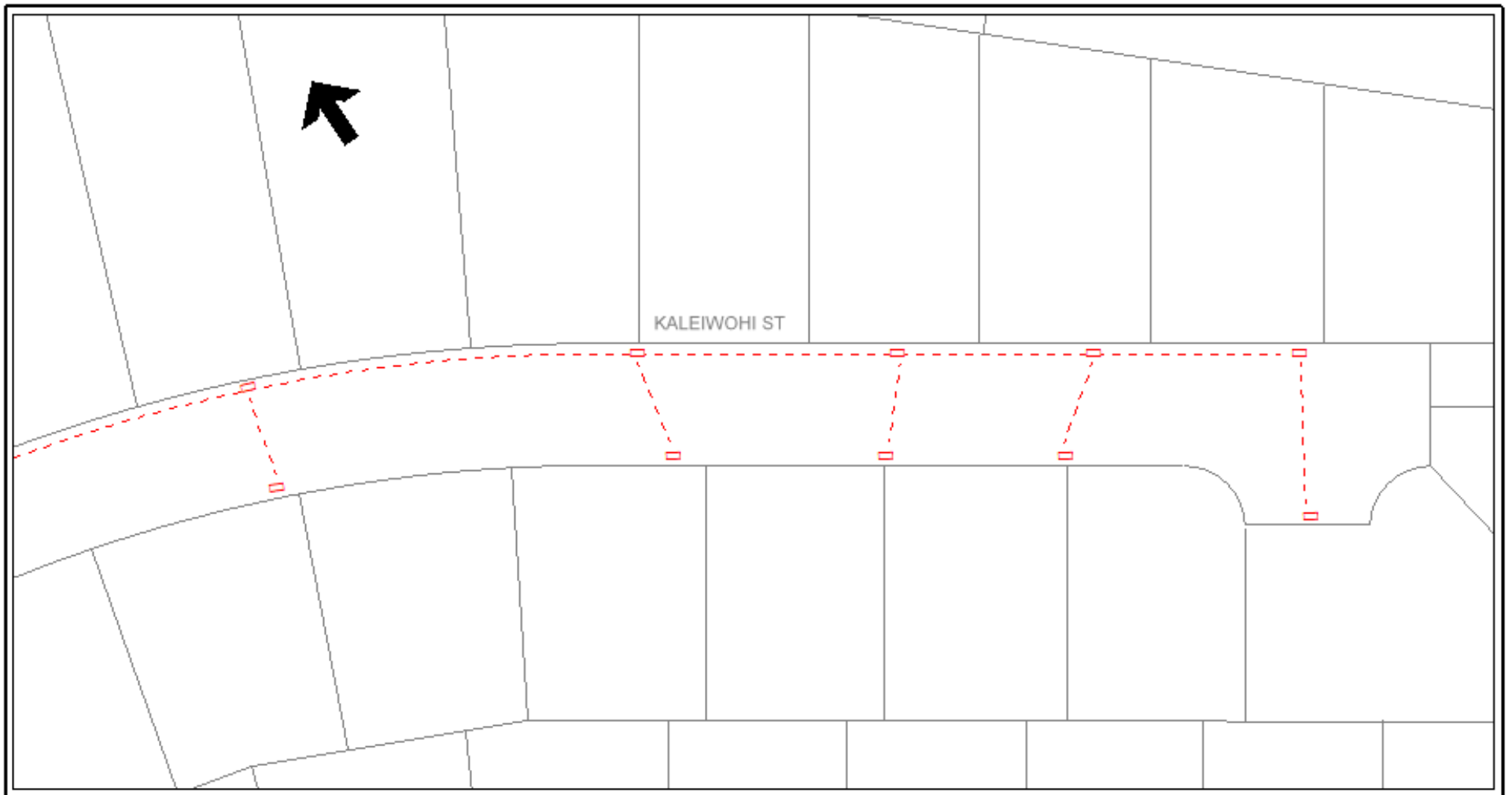
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_____KV._____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

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TITLE:

[Auto]

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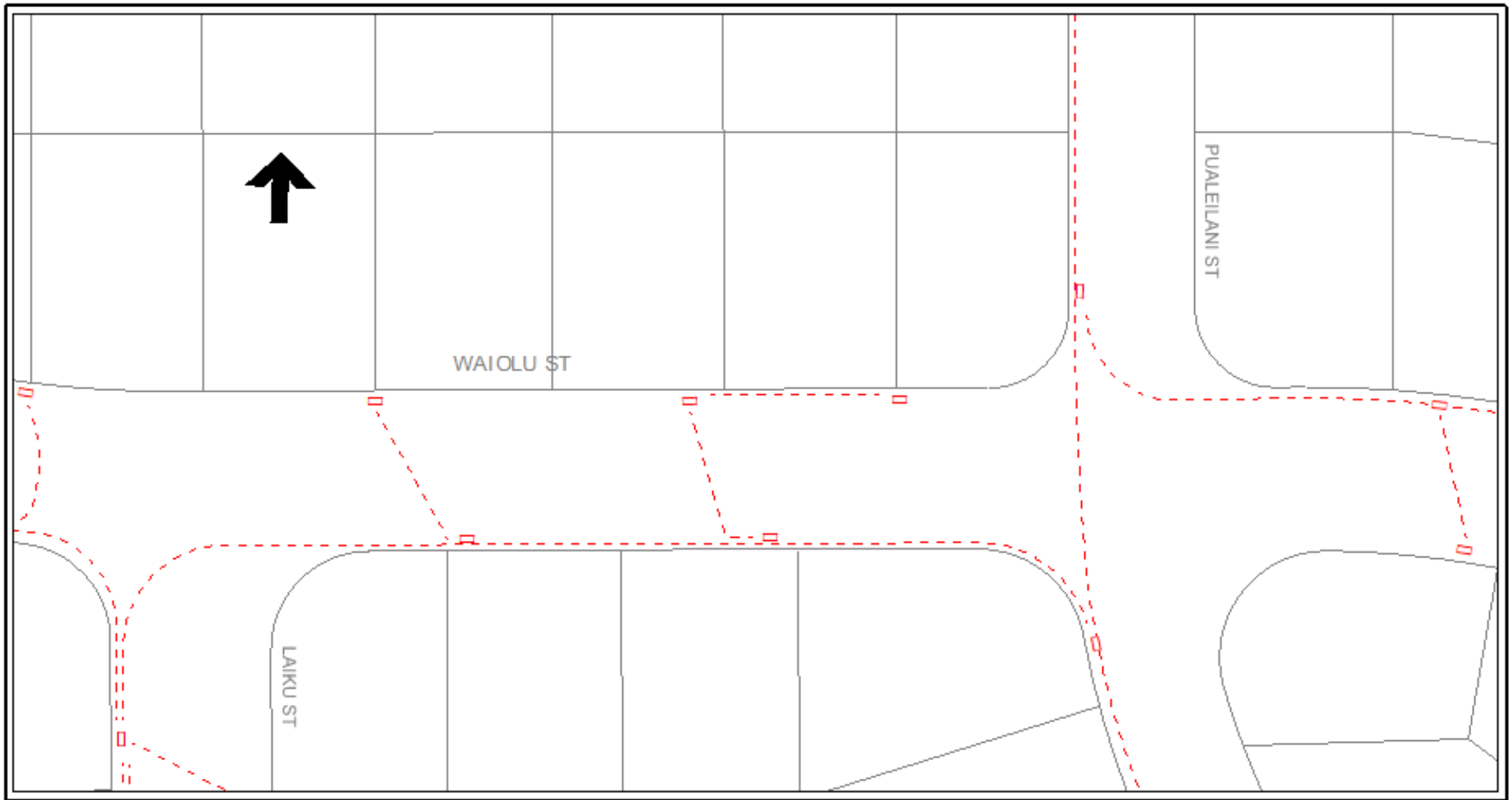
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ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

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☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

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BRIDGE TAP(S) FOOTAGE_____

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WORK SAFELY HIGH VOLTAGE

POWER CO._____

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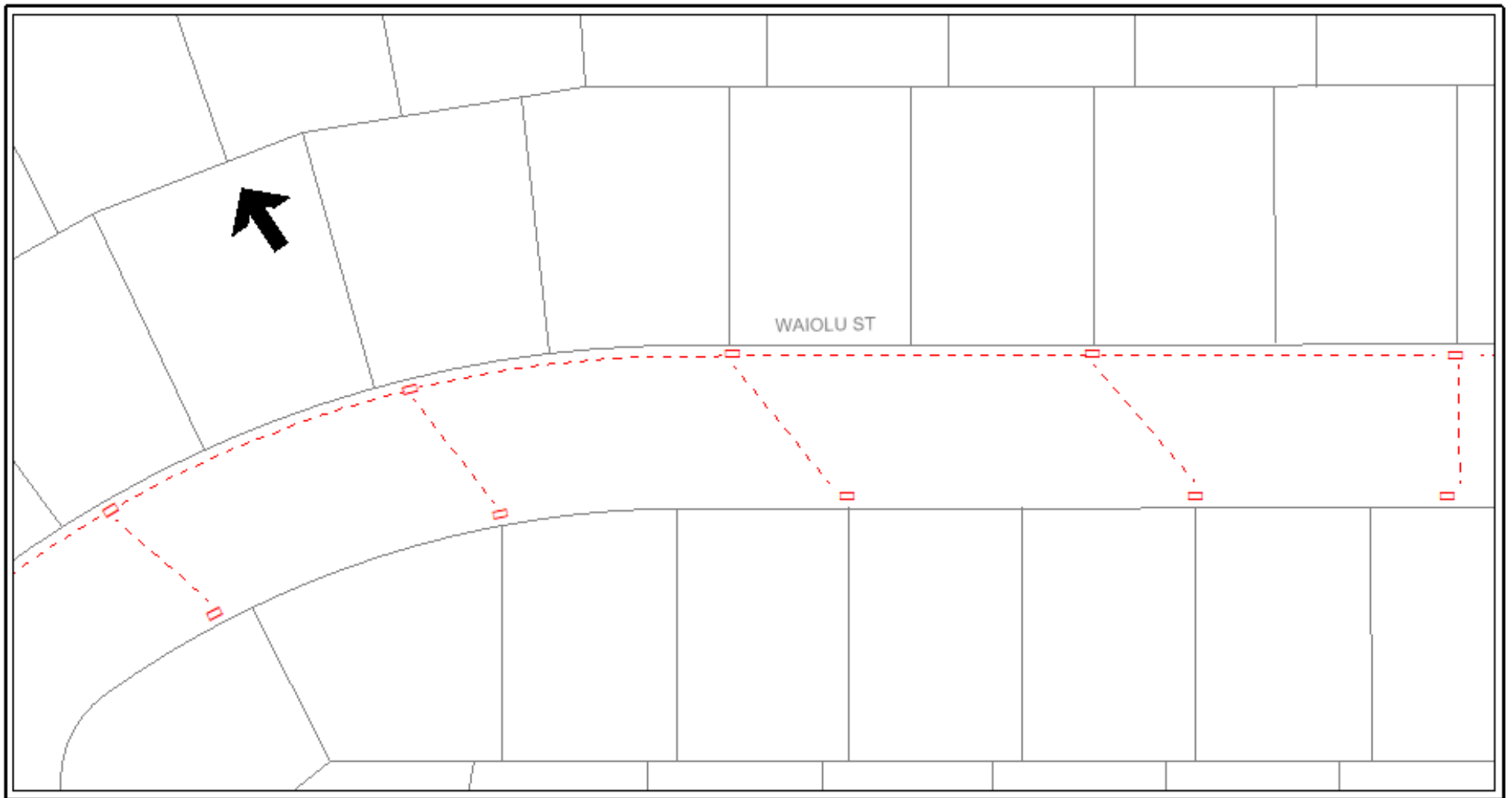
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ISSUE

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DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

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☐ DATA
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☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

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END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY
HIGH VOLTAGE

POWER CO._____

_____KV_____PHASE

CONNECTED_____

GROUNDED_____

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TITLE:

[Auto]

Hawaiian Telcom

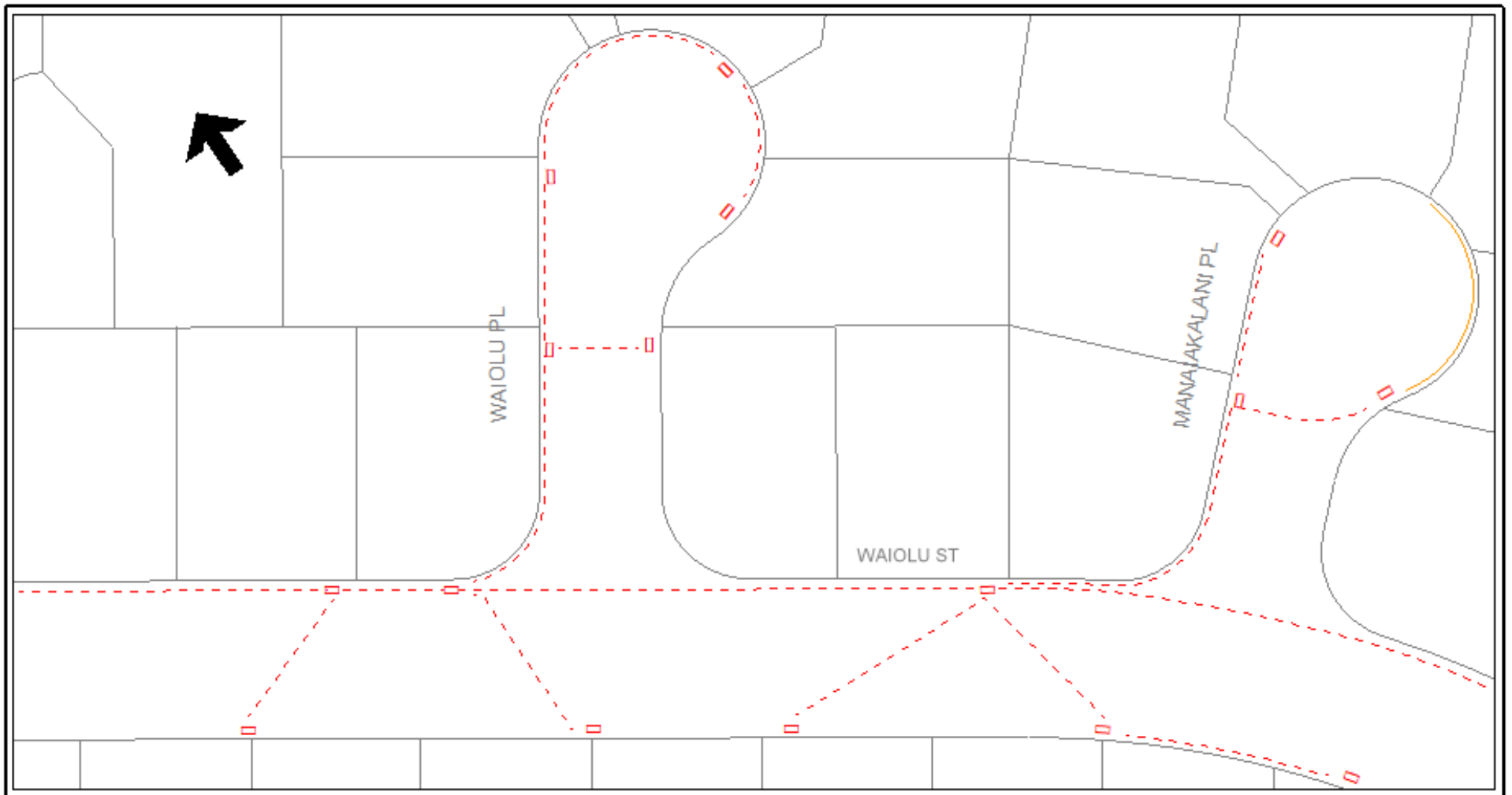
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ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

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END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY
HIGH VOLTAGE

POWER CO._____

_____KV._____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

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C.O.

ENG.[Auto] TEL

DRAWN BY:[Auto] DATE: [Auto]

APP'D SHT OF

TITLE:

[Auto]

Hawaiian Telcom

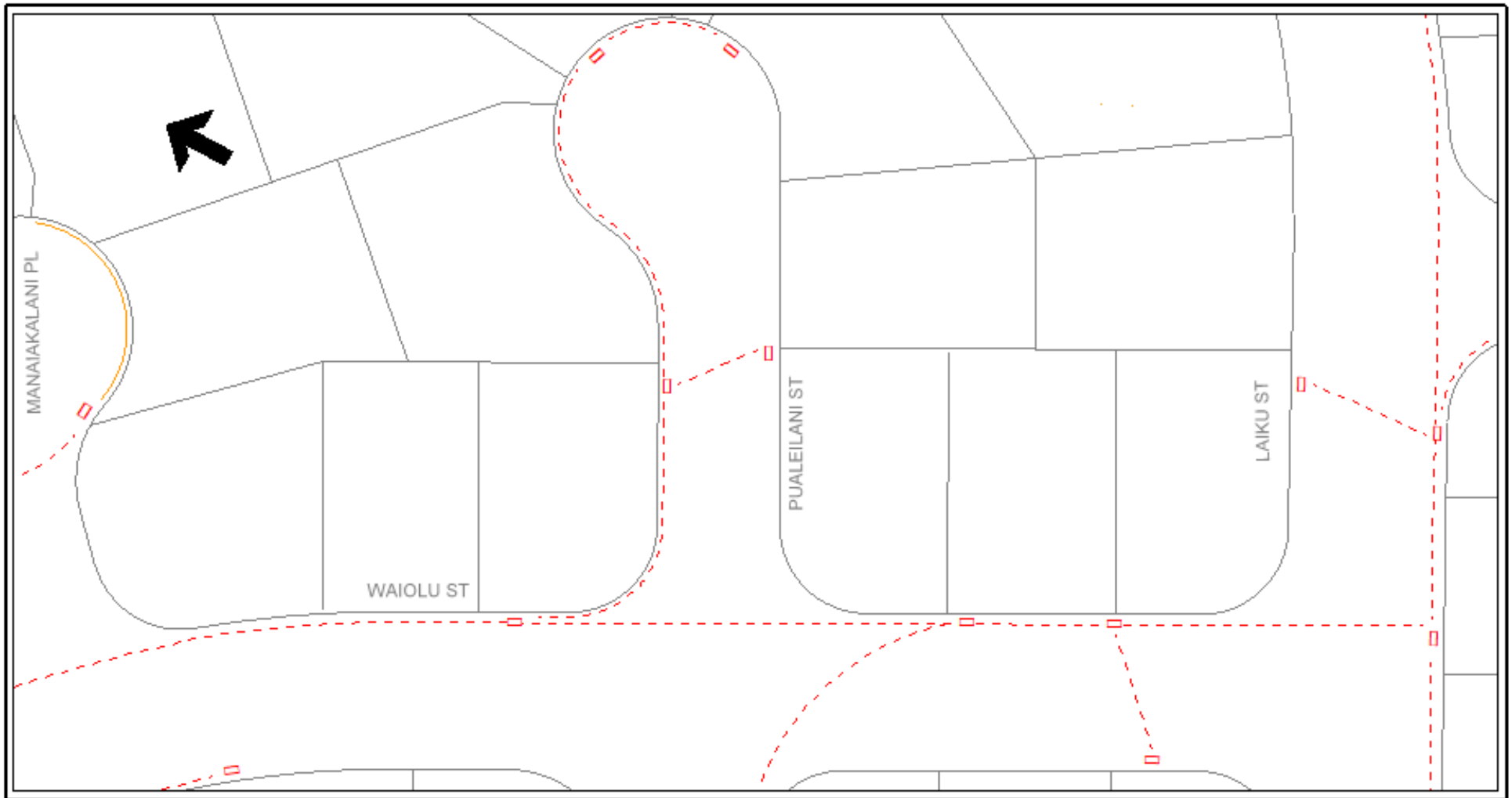
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ISSUE

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☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

TRANSMISSION CRITERIA

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END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY HIGH VOLTAGE

POWER CO._____

_____ KV _____ PHASE

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APP'D SHT. OF.

TITLE:

[Auto]

Hawaiian Telcom

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TRANSMISSION CRITERIA

BRIDGE TAP(S) FOOTAGE_____

END SECTION FOOTAGE_____

LOOP ELR _____ OHMS LOOP EML _____ dB

OFFICE LOOP LIMIT_____ OHMS

WORK SAFELY
HIGH VOLTAGE

POWER CO._____

_____KV_____PHASE

CONNECTED_____

GROUNDED_____

COMMENTS_____

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CODES:

PCAT: [Auto] PIPELINE NO.

JOB PRE-FIELDED BY: DATE PRE-FIELDED:

C.O.

ENG [Auto] TEL

DRAWN BY [Auto] DATE [Auto]

APP'D SHT. OF

TITLE:

[Auto]

Hawaiian Telcom

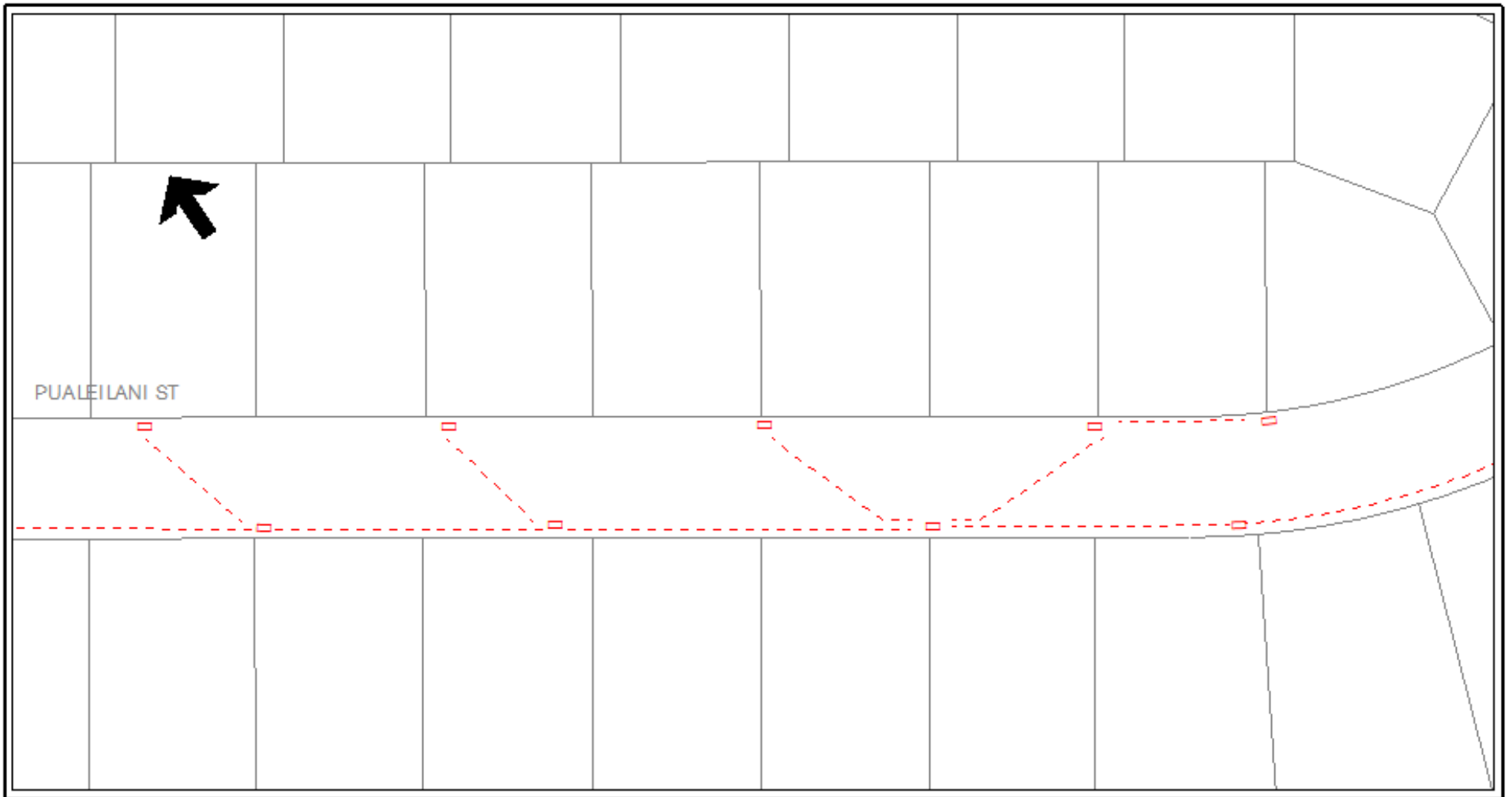
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ISSUE

☐ ORIGINAL

☐ REV NO._____

DATE: _____



SPECIAL CIRCUITS

ASGNMT REC'S DATE_____

DESIGN REVIEW REQ'D ☐ YES ☐ NO

IF YES, ATTACH COMPLETED

SPECIAL SERVICES CHANGE NOTICE

☐ T1
☐ DATA
☐ TRUNK
☐ SELEX
☐ OTHER
☐ NONE

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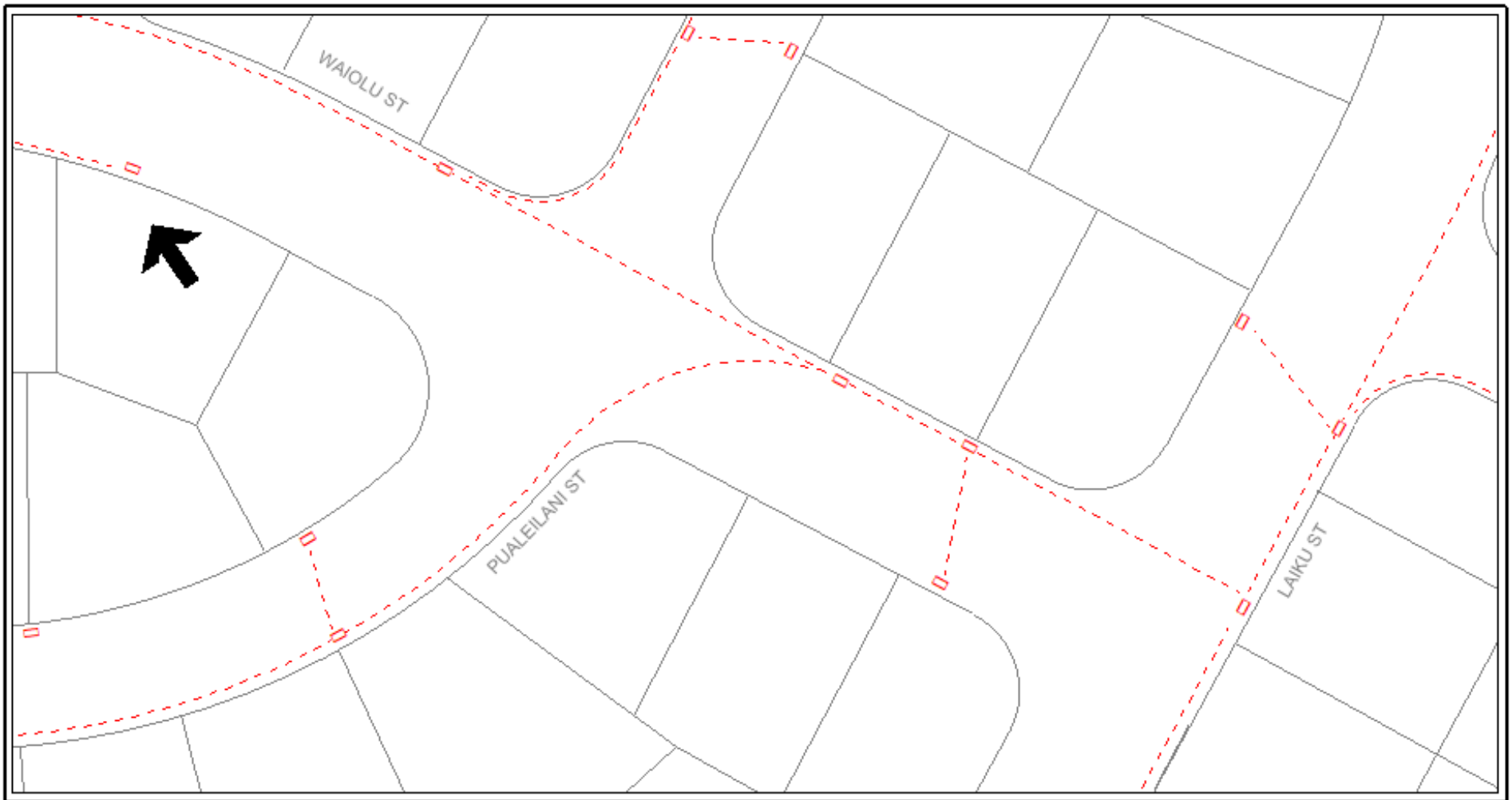
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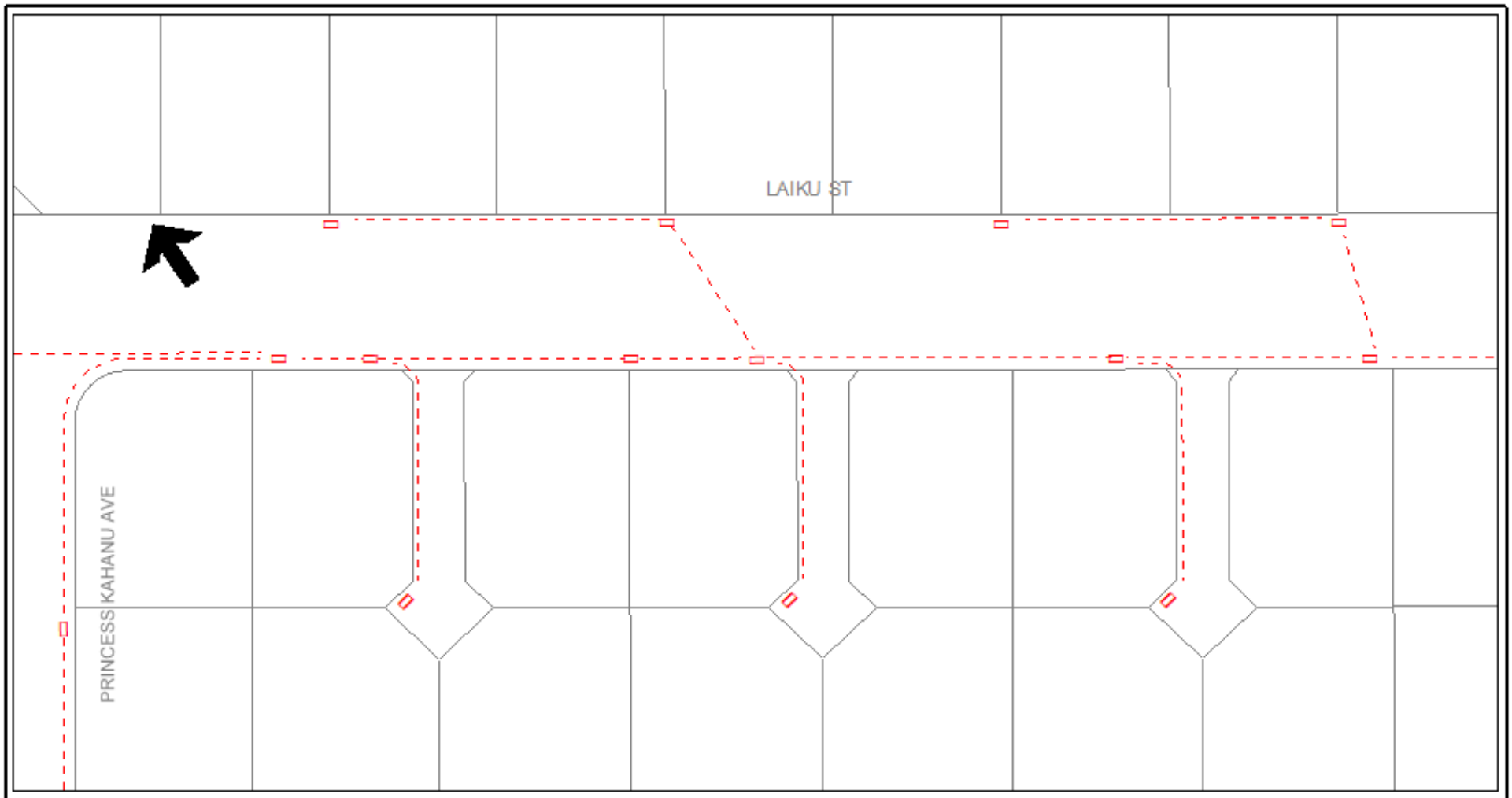
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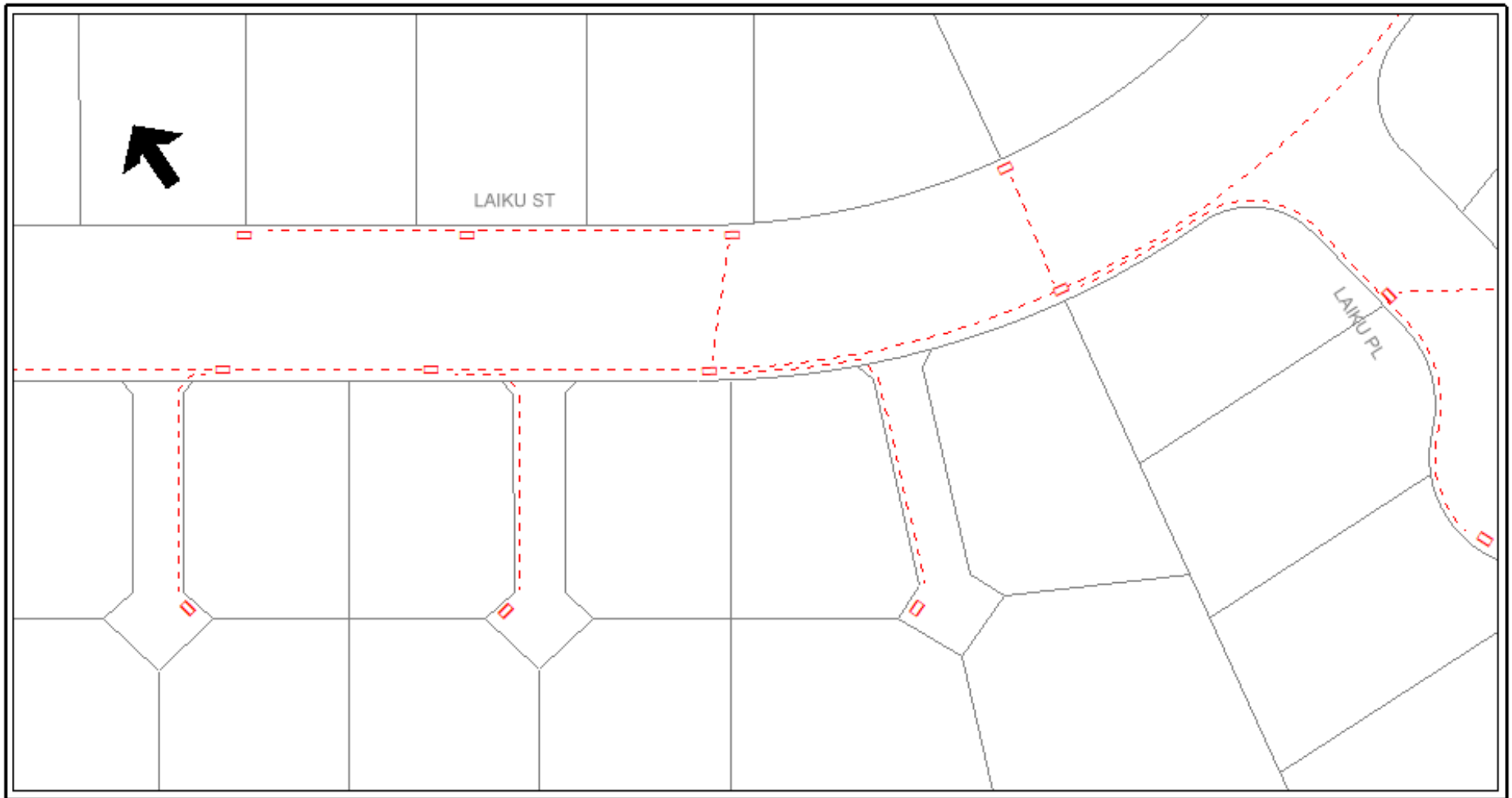
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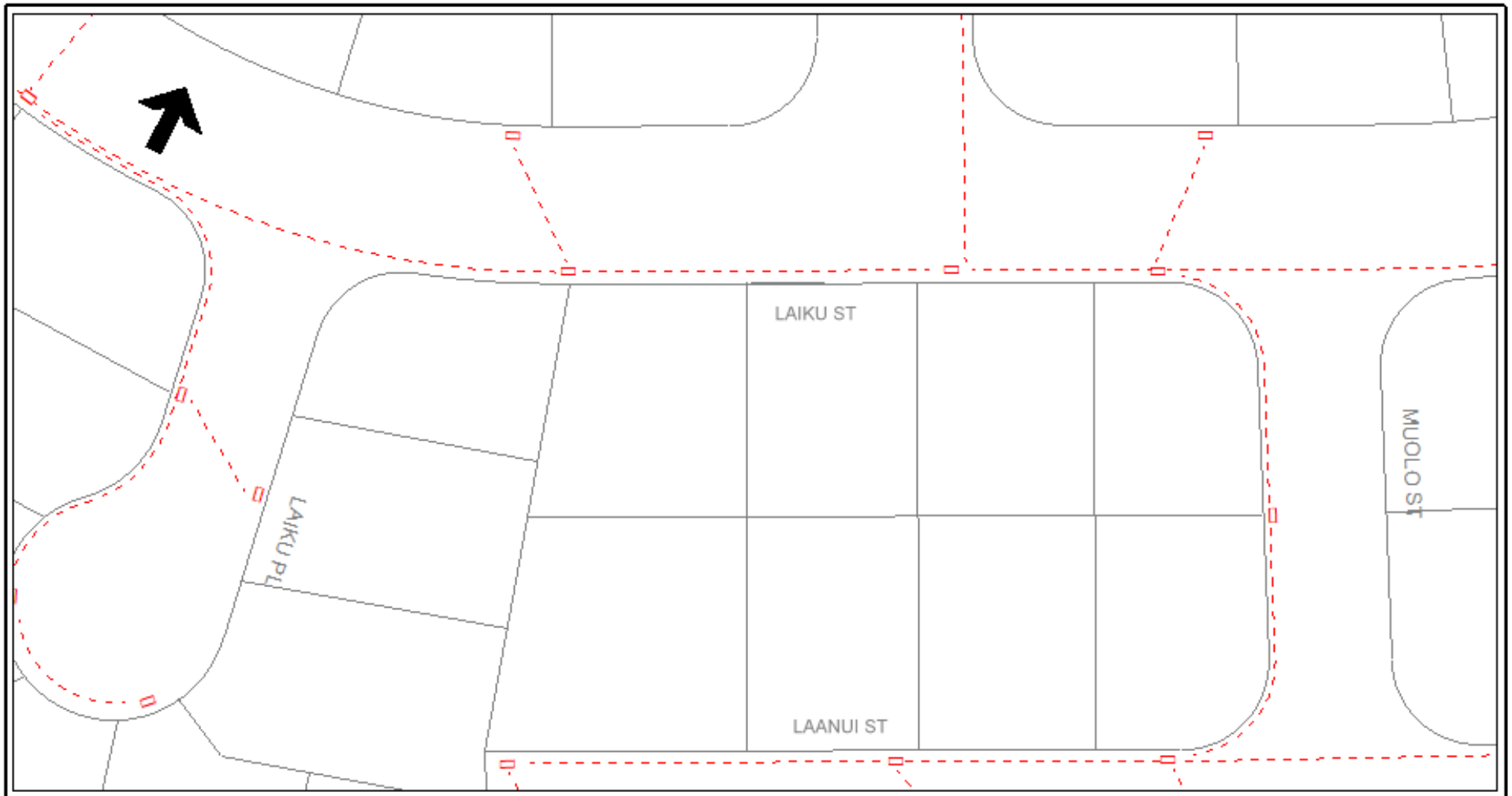
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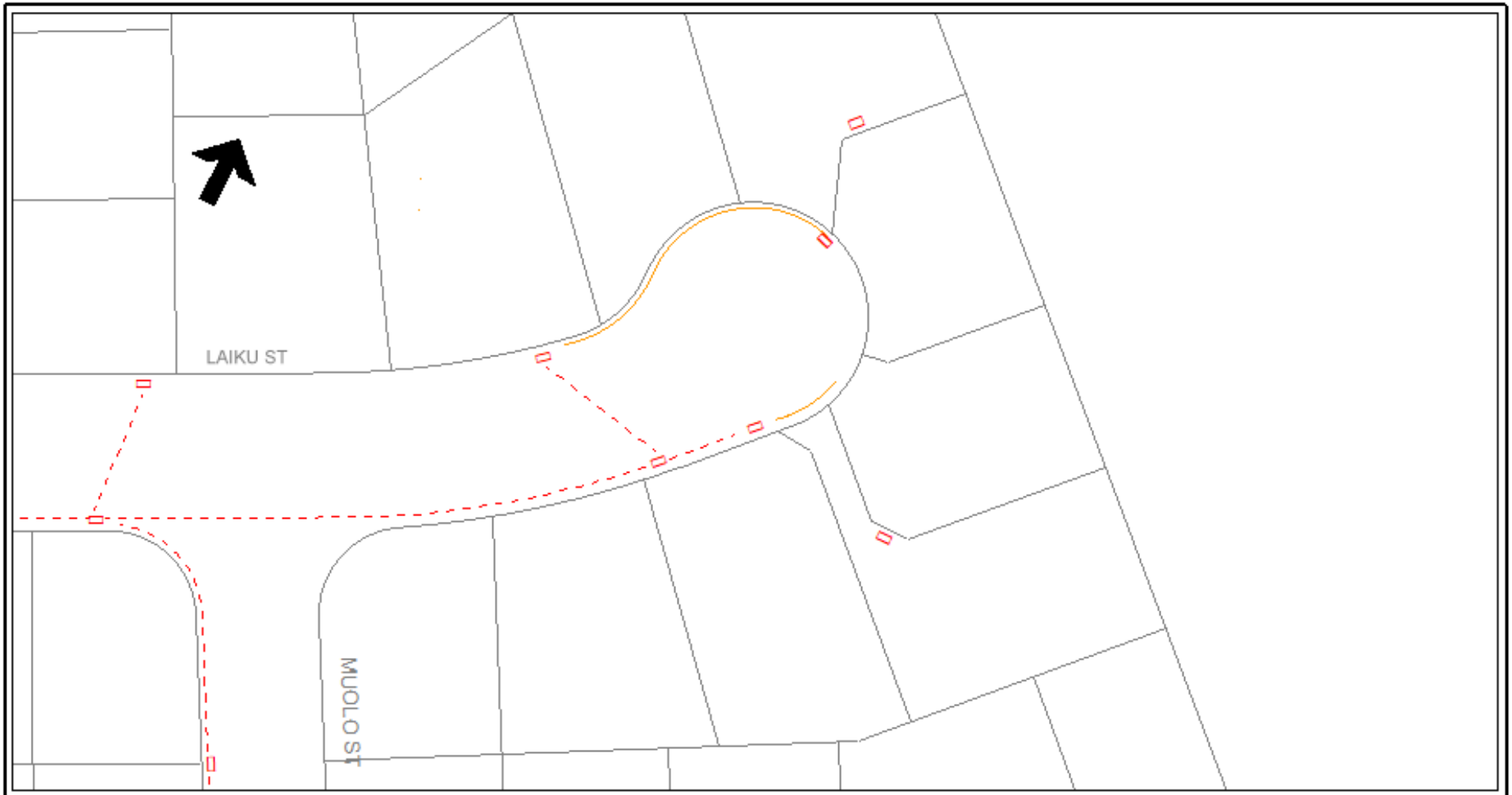
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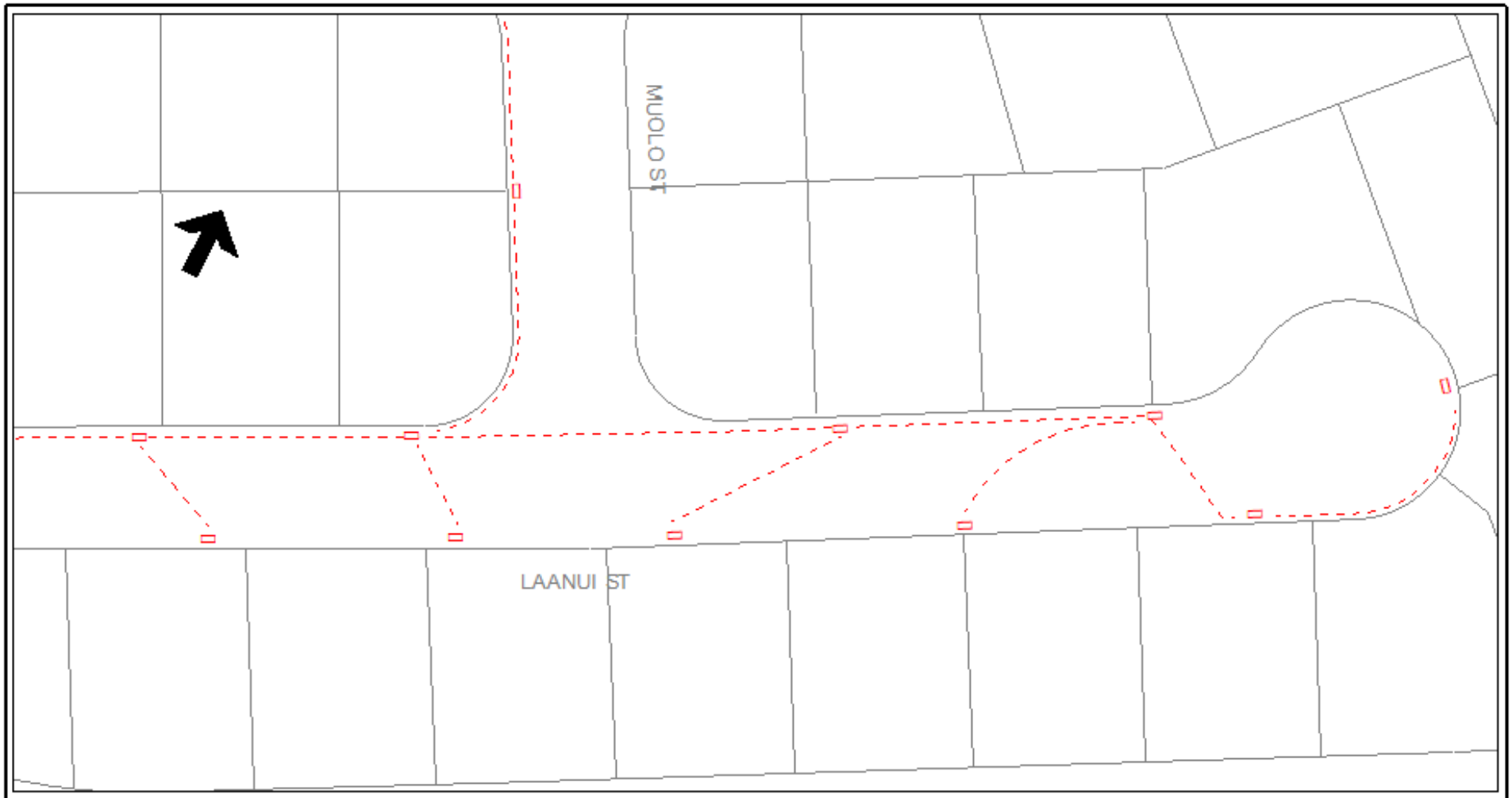
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ISSUE

☐ ORIGINAL

☐ REV NO.____

DATE:____

HAKIMO RD

FARRINGTON HWY

LUALEI PL

PONAHAKEONE PL

ASTROPAN

KALEIMOHALU ST

WAIOLU ST

PULELEHUA ST

PUALEILANI ST

PRINCESS KAHANU AVE

Maui Ballistics

Yamamoto, Keith

1/13/2021

11:20:00 AM

PRINCESS KAHANU AVE

WAIOLU ST

WAIOLU PL

MANAIAKALANI PL

PUALELANI ST

LAIKU ST

MOHIHI ST

KEHAU PL

KEHAU LP

KEHAU PL

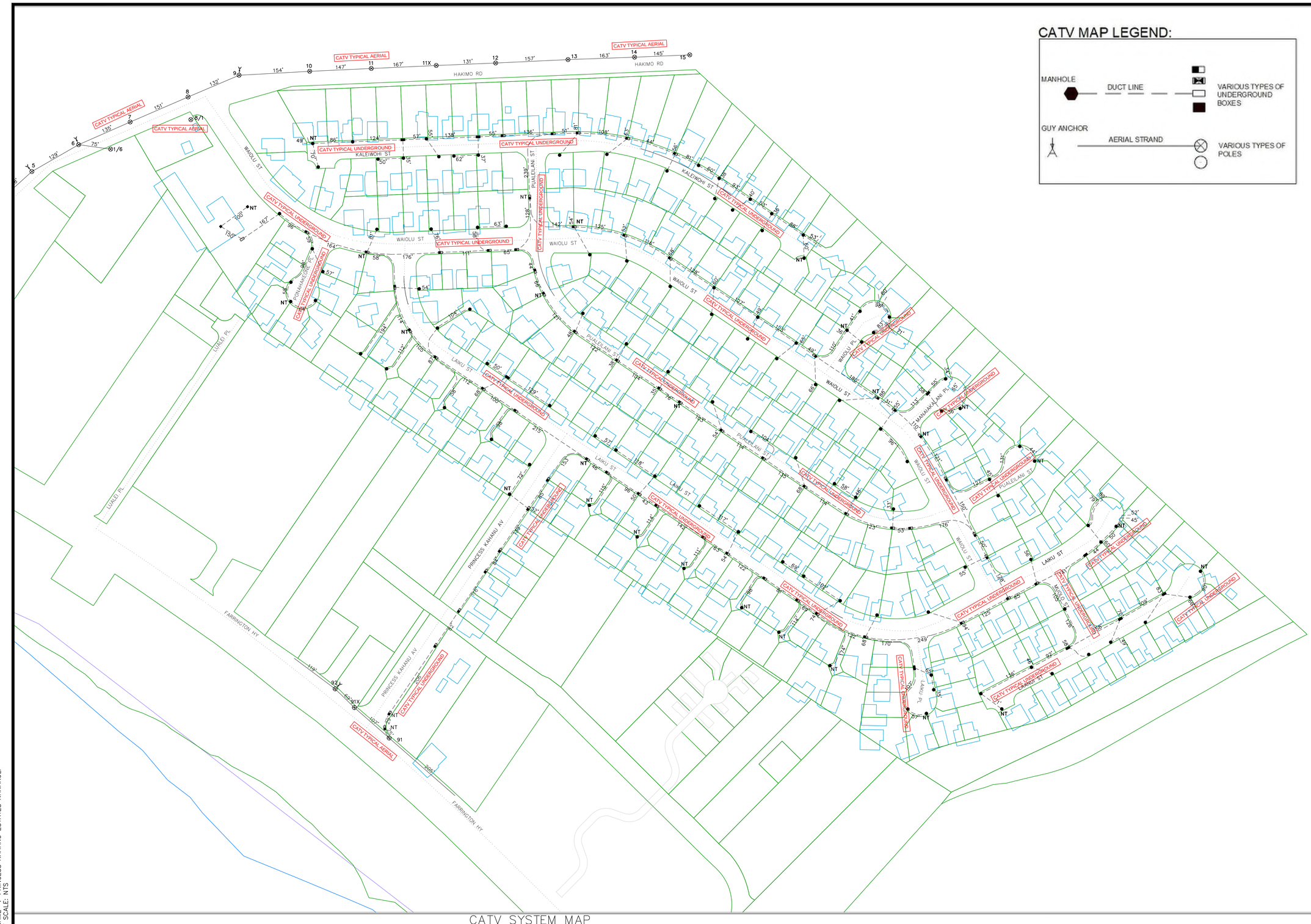
HALIKE PL

FARRINGTON HWY

Yamamoto, Keith

1/13/2021

11:20:25 AM



CATV SYSTEM MAP
SCALE: NTS

200 AKAMAINUI STREET
MILILANI, HI 96789-3999
PHONE # (808) 625-2100

DHHL SEWER PROJECT - NANAKULI

PRINCESS KAHANU ESTATES
NANAKULI

TITLE:
LOCATION MAP
NOTES
CATV RISER DIAGRAM
CATV SYSTEM MAP

DATE: 1/27/21

SCALE: NTS

DES. BY	DR. BY	CHK. BY
JD	JD	JD

PROJECT NO:

SHEET NO: 1

1 OF 1 SHEETS

FILENAME : PRINCESS KAHANU ESTATES NANAKULI
PLOT SCALE: NTS