

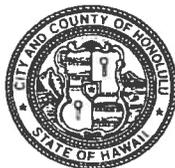
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 768-8480 • FAX: (808) 768-4567
WEB SITE: www.honolulu.gov

FILE COPY

JUN 08 2015

KIRK CALDWELL
MAYOR



ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

CDD-A 15-609456

May 18, 2015

Ms. Jessica Wooley, Director
Office of Environmental Quality Control
Department of Health
State of Hawaii
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

RECEIVED
15 MAY 20 P 1:45
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Dear Ms. Wooley:

SUBJECT: Nuuanu Pali Drive and Old Pali Road Storm Drainage
Improvements
Draft Environmental Assessment and Anticipated Finding of
No Significant Impact (DEA-AFNSI)

With this letter, we hereby transmit the DEA-AFNSI for the Nuuanu Pali Drive and Old Pali Road Storm Drainage Improvements project situated at TMK: 1-9-000, 1-9-004, 2-2-000, and 2-2-051: 054, in the Honolulu District on the island of Oahu, for the publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two (2) copies of the DEA-AFNSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Should you have any questions, please contact Stanley Katsura with the Civil Division at 768-8831.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert J. Kroning".

Robert J. Kroning, P.E.
Director

KC:DT:lal

Enclosures

cc: ParEn Inc. (w/o enclosures)

**AGENCY ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JANUARY 2013 REVISION)**

Project Name: Nuuanu Pali Drive and Old Pali Road Drainage Improvements

Island: Oahu

District: Honolulu

TMK: 1-9-000, 1-9-004, 2-2-000, 2-2-051: 054

Permits: Department of the Army Permit, Department of Health Water Quality Certification, Department of Land and Natural Resources Stream Channel Alteration Permit, Office of Planning Coastal Zone Management Certification, City and County of Honolulu Building Permits

**Proposing/
Determination Agency** **Department of Design and Construction
City and County of Honolulu**
Ms. Kristie Ching
650 South King Street, 11th Floor
Honolulu, Hawaii 96813
T: (808) 768-8480
E: kching1@honolulu.gov

Consultant: **Environmental Communications, Inc.**
Taeyong Kim, Principal Planner
P.O. Box 236097
Honolulu, Hawaii 96823
T: (808) 528-4661
E: tkim@environcom.com

Status (check one only):

DEA-AFNSI Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.

FEA-FONSI Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

FEA-EISPN Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.

Act 172-12 EISPN Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqc@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.

DEIS The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC

publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.

___ FEIS

The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

___ Section 11-200-23
Determination

The approving agency simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.

___ Statutory hammer
Acceptance

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.

___ Section 11-200-27
Determination

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

___ Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The proposed action consists of the demolition and replacement of a portion of an existing storm water drainage system in the vicinity of the intersection of Nuuanu Pali Drive and Old Pali Road and well as a new outlet structure in to Nuuanu Stream.

The existing system of 18-inch, 24-inch, and 30-inch pipes, inlets and drain manholes will be replaced while the main collector line will be increased to a 36-inch pipe.

Presently, storm water collected in the existing system is conveyed to a 30-inch pipe that discharges directly into Nuuanu Stream. This portion will be replaced by a 36-inch pipe and a new concrete impact outlet structure with a 4-foot thick layer of dumped riprap for erosion protection.

The current outlet structure is located on a residential lot with a drainage easement in favor of the City and County of Honolulu. This easement will be cancelled and moved towards the northeast boundary of the property where the new drain line and outlet structure will be located. This new location will also minimize the impact to the existing dwelling unit. Existing CRM walls, slabs and stairs will be removed as part of the project and will be reconstructed or replaced.

**Nuuanu Pali Drive and Old Pali Road
Storm Drainage Improvements**
Honolulu District, Island of Oahu
Tax Map Keys: 1-9-000, 1-9-004, 2-2-000 and 2-2-051: 054

Draft Environmental Assessment

Proposing Agency: Department of Design and Construction
City and County of Honolulu

May 2015

Nuuanu Pali Drive and Old Pali Road

Storm Drainage Improvements

Honolulu District, Island of Oahu

Tax Map Keys: 1-9-000, 1-9-004, 2-2-000 and 2-2-051: 054

Preliminary Draft Environmental Assessment

Prepared by the Department of Design and Construction pursuant to Chapter 343, Hawaii Revised Statutes (HRS)

Notice of availability of this document will be made in the Environmental Notice published by the Office of Environmental Quality Control. Written comments regarding this document will be included in the Final Environmental Assessment.

For additional information concerning this document please contact:

Mr. Taeyong Kim
Environmental Communications, Inc.
P.O. Box 236097
Honolulu, HI 96823
Email: tkim@envirocom.com

A copy of any comments or requests should be made to:

Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

TABLE OF CONTENTS

I.	Project Summary	3
II.	Proposed Project and Statement of Objectives	5
	A. Project Location	5
	B. Project Description	6
	C. Project Construction Sequence	7
	D. Project Objective and Need for Action	8
	E. Alternatives Considered	9
III.	Description of Anticipated Impacts and Mitigation Measures	19
	A. Environmental Setting	19
	B. Surrounding Uses	20
	C. Environmental Considerations	20
	1. Geological Characteristics	20
	2. Water Resources	23
	3. Archaeological, Cultural, Botanical and Faunal Resources	25
	4. Infrastructure and Utilities	27
	5. Public Facilities	28
	D. Social/Economic Considerations	29
	E. Relationship to Plans, Codes and Ordinances	29
	F. Probable Impact on the Environment	30
	G. Adverse Impacts Which Cannot be Avoided	31
	H. Alternatives to the Proposed Action	31
	I. Mitigation Measures	31
	J. Irreversible and Irretrievable Commitment of Resources	32
IV.	Reasons Supporting Anticipated Finding of No Significant Impact	33
V.	List of Parties Consulted Prior to Development of the	36
	Draft Environmental Assessment	
VI.	List of Parties to be Consulted During the	37
	Draft Environmental Assessment	

LIST OF FIGURES

Figure 1	Tax Map with Zoning Designation.....	5
Figure 2	Aerial Photograph.....	6
Figure 3	General Plan.....	10
Figure 4	Demolition Plan - 1.....	11
Figure 5	Demolition Plan - 2.....	12
Figure 6	Demolition Plan - 3.....	13
Figure 7	Plan and Profile - 1.....	14
Figure 8	Plan and Profile - 2.....	15
Figure 9	Plan and Profile - 3.....	16
Figure 10	Wall Reconstruction Plan.....	17
Figure 11	Enlarged Drainage Outlet Plan.....	18
Figure 12	Soil Survey Map.....	22
Figure 13	Land Classification Map.....	23
Figure 14	Flood Hazard Map.....	24

LIST OF PHOTOS

Photo 1	Existing 30-inch Outlet Structure.....	7
Photo 2	View of Auwai within TMK: 2-2-051: 010.....	19
Photo 3	Upstream View of Project Site.....	20

APPENDIX

- A. Project Drawings for Nuuanu Pali Drive and Old Pali Road Storm Drainage Improvements
- B. Archaeological, Ethnographic, and Biological Survey of TMK: (1) 2-2-051: 054, Nu'uuanu Ahupua'a, Kona District, Island of O'ahu, Hawai'i

I. PROJECT SUMMARY

PROPOSING AGENCY:	Department of Design and Construction 650 South King Street, 11 th Floor Honolulu, Hawaii 96813
PROJECT NAME:	Nuuanu Pali Drive and Old Pali Road Drainage Improvements
PROJECT LOCATION:	Roadways of Nuuanu Pali Drive and Old Pali Road and 3659 Nuuanu Pali Drive Honolulu, Oahu, Hawaii
TAX MAP KEY/ OWNERSHIP:	1-9-000 / City and County of Honolulu 1-9-004 / City and County of Honolulu 2-2-000 / City and County of Honolulu 2-2-051: 054 / private ownership
AREA:	1-9-004 / roadway 1-9-009 / roadway 2-2-000 / roadway 2-2-051: 054 / 17,596 sf
ZONING:	R-10 Residential District
STATE LAND USE:	Urban District
CURRENT LAND USE:	The project area is located in a single-family dwelling zoned residential district. Work proposed in the area will affect a single residential lot and the roadways of Nuuanu Pali Drive and Old Pali Road. The proposed infrastructure improvements will not result in any change of use or intensity of use.
PROJECT SCOPE:	<p>The proposed action consists of the demolition and replacement of a portion of an existing storm water drainage system in the vicinity of the intersection of Nuuanu Pali Drive and Old Pali Road and well as a new outlet structure into Nuuanu Stream.</p> <p>The existing system of 18-inch, 24-inch, and 30-inch pipes, inlets and drain manholes will be replaced with same size high density polyethelene (HDPE) pipes while the main collector line will be increased to a 36-inch pipe. Seven (7) new catch</p>

basins and four (4) new drain manholes will also be installed.

Presently, storm water collected in the existing system is conveyed to a 30-inch pipe that discharges directly into Nuuanu Stream. This portion will be replaced by a 36-inch pipe and a new concrete impact outlet structure with a 4-foot thick layer of dumped riprap for erosion protection.

The current outlet structure is located on a residential lot with a drainage easement in favor of the City and County of Honolulu. This easement will be cancelled and moved towards the northeast boundary of the property where the new drain line and outlet structure will be located. This new location will also minimize the impact to the existing dwelling unit. Existing CRM walls will be removed as part of the project and will be reconstructed or replaced.

PROJECT COST/PHASING

The estimated construction cost for the project is \$1,131,900.00.

The proposed project will be conducted in a single continuous phase with a projected commencement date of August 2016 and a completion date of August 2017. The improvements should be completed in approximately 12 months.

PERMITS AND APPROVALS

Department of the Army Permit (404 Nationwide)
Department of Health Water Quality Certification (401 WQC)
Department of Land and Natural Resources Stream Channel Alteration Permit (SCAP)
Office of State Planning Coastal Zone Management Certification (CZM)
City and County of Honolulu Building Permits

II. PROPOSED PROJECT AND STATEMENT OF OBJECTIVES

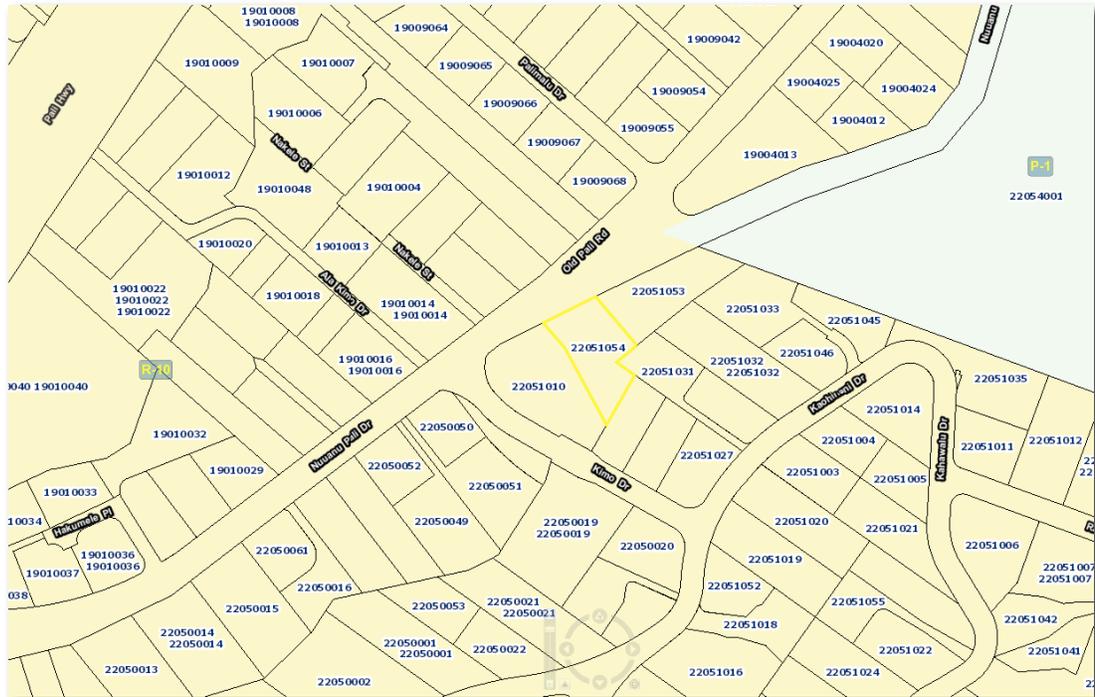
A. Project Location

The proposed improvements are located within a single-family dwelling residential district located in Nuuanu, Oahu, Hawaii. Specifically, the proposed improvements will involve a portion of two roadways located at the juncture of Old Pali Road and Nuuanu Pali Drive, and a single-family residential lot which includes a portion of Nuuanu Stream.

Improvements proposed on Old Pali Road include the construction of three (3) new catch basins, a new drain manhole and new 18-inch, 30-inch and 36-inch drain lines. Improvements planned on Nuuanu Pali Drive will consist of four (4) new catch basins, three (3) new drain manholes, and new 18-inch, 24-inch and 36-inch drain lines. The single-family parcel affected by the proposed improvements is identified as 3659 Nuuanu Pali Drive, a 17,596 square foot parcel zoned R-10.

The surrounding neighborhood is characterized by spacious single-family lots located within a low density, low traffic residential area. The project area generally slopes from east to west (mauka to makai) and north to south (towards Nuuanu Stream).

Figure 1: TMK Map with Zoning Designation



Source: City and County of Honolulu, Honolulu Land Information System (HoLIS)

Figure 2: Aerial Map of Project Area



Source: Google Earth

B. Project Description

The proposed action consists of the demolition and replacement of a portion of an existing storm water drainage system in the vicinity of the intersection of Nuuanu Pali Drive and Old Pali Road and well as a new outlet structure into Nuuanu Stream (see Figure 3). Demolition plans are shown in Figures 4 to 6.

The existing system of 18-inch, 24-inch, and 30-inch pipes, inlets and drain manholes will be replaced with same size high density polyethelene (HDPE) pipes while the main collector line will be increased to a 36-inch pipe. Seven (7) new catch basins and four (4) new drain manholes will also be installed. Plans and profiles of the proposed improvements are shown in Figures 7 to 9.

Other improvements on the project site include the replacement of retaining walls. These improvements are shown in Figure 10.

Presently, storm water collected in the existing system is conveyed to a 30-inch pipe and discharges directly into Nuuanu Stream. This portion will be replaced by a 36-inch pipe and a new concrete impact outlet structure with a 4-foot thick layer

of dumped riprap for erosion protection. The proposed drainage outlet plan is shown in Figure 3.

Photo 1: View of Existing 30-inch Outlet Structure



Source: AECOS Inc.

The current outlet structure is located on a residential lot with a drainage easement in favor of the City and County of Honolulu. This easement will be cancelled and moved towards the northeast boundary of the property where the new drain line and outlet structure will be located. This new location will minimize the impact to the existing dwelling unit. Existing CRM walls will be removed as part of the project and will be reconstructed or replaced.

C. Project Construction Sequence

The proposed improvements will be conducted during a 12-month long construction period that will be completed in a single continuous phase with five (5) components to be completed in sequence.

Mobilization and pre-construction monitoring will initiate the project. It is projected that approximately two weeks of mobilization and staging will be required prior to the commencement of construction. During this time, water

quality monitoring and settlement monitoring will be started. Settlement monitoring will cease upon completion of construction activities on TMK: 2-2-051: 054 while water quality monitoring will cease approximately one month after all construction work is completed.

The construction portion of the project will initiate with the clearing and construction of new drainage improvements within TMK: 2-2-051: 054, the single-family parcel. This portion of work will include the installation of BMPs, clearing and grubbing, removal of affected trees, concrete structures, a portion of the drainline, and retaining wall. New construction will consist of a drainage outlet and drain lines, reconstruction of retaining walls and restoration of the project site.

The second component will consist of the drainage improvements within the intersection of Nuuanu and Old Pali Drive. This will include installation of BMPs, demolition and removal of roadway pavement and existing drain lines, installation of temporary drain by-pass measures, installation of new drain structures and pipes, construction of new roadway improvements, and restoration of the project site.

In the third segment, work will return to TMK: 2-2-051: 054 to install riprap, grass and remove BMP's. Grass maintenance for 60 days will complete work within this parcel.

The fourth component will consist of work within Old Pali Road which will include installation of BMPs, demolition of roadway pavement, relocation of waterlines, demolition and removal of existing drain lines and structures, installation of temporary by-pass measures, installation of new structures and pipes and construction of new roadway improvements and restoration of the project site.

The final component will consist of work within Nuuanu Pali Drive which will similarly include installation of BMPs, demolition of roadway pavement, drain lines and associated structures, installation of new drain structures and pipes, construction of new roadway improvements, grassing and grassing maintenance. Work will be completed with the repair of roads, removal of temporary BMPs, site restoration and demobilization of all construction equipment and materials.

D. Project Objective and Need for Action

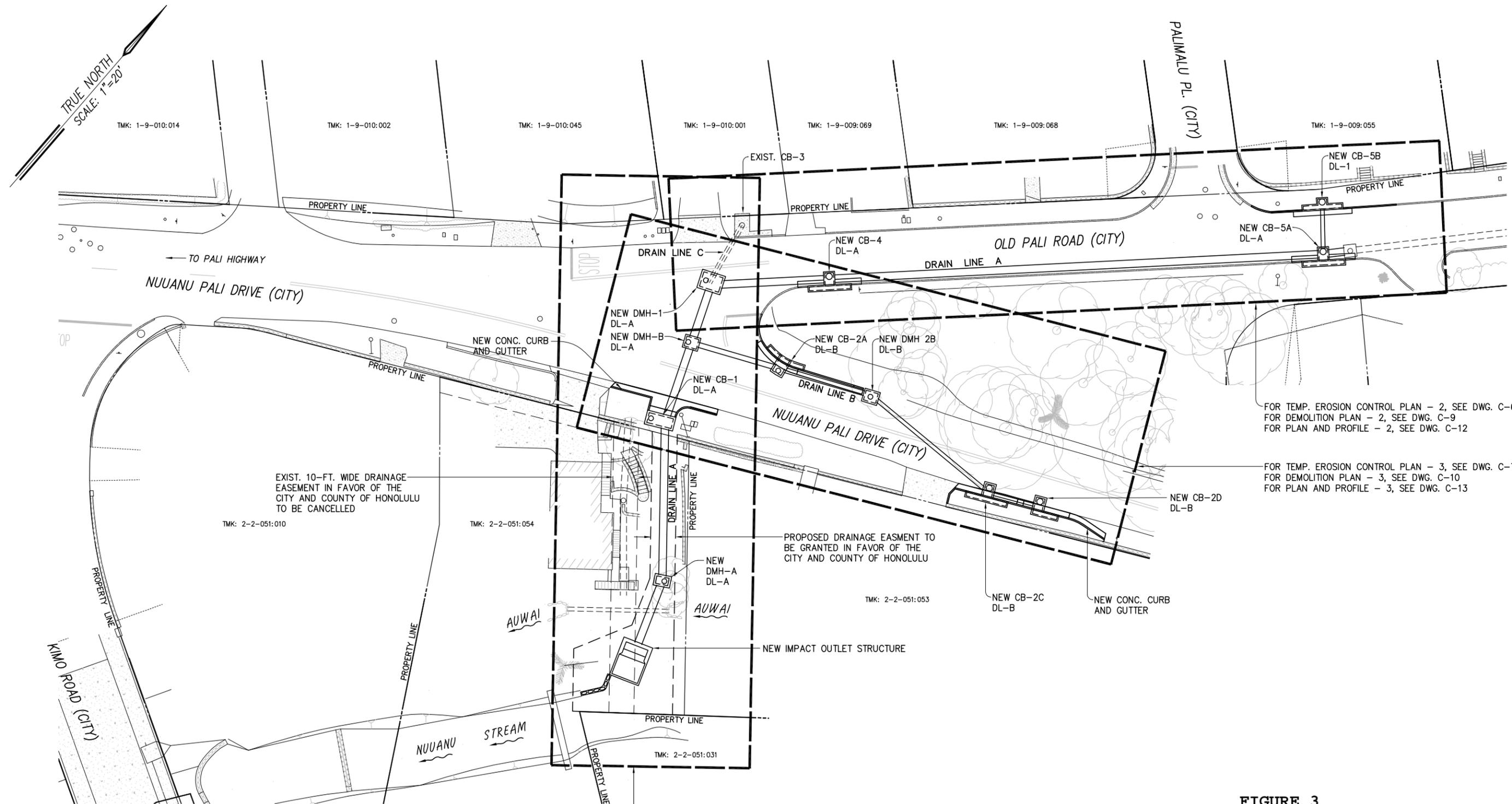
The objective of the proposed action is to improve storm water drainage in the project area and to safely convey the drainage to Nuuanu Stream. The current storm drain system has been determined to be undersized and has potential to adversely affect the surrounding properties. Settlement in the area near the existing drainage system has also been observed. The proposed outlet structure

will provide improved erosion mitigation as well as a controlled flow of discharging storm water.

The subject Environmental Assessment is prepared in conformance with Chapter 343 Hawaii Revised Statutes, as the project will involve the use of County lands and funds. The roadway properties are owned by the City and County of Honolulu and funding of all improvements will be provided the City and County of Honolulu as well. Improvements occurring on the privately owned property will also be borne by the proposing agency as the improvements are part of the larger municipal infrastructure system.

E. Alternatives Considered

Improvements to the drainage system in the project area are considered a priority therefore non-action was not considered a viable alternative. Other alignments were considered but would not be as effective or direct therefore a replacement using the current alignment is considered the most effective and least disruptive in consideration of the limited space available for the drain alignment.



FOR TEMP. EROSION CONTROL PLAN - 2, SEE DWG. C-6
 FOR DEMOLITION PLAN - 2, SEE DWG. C-9
 FOR PLAN AND PROFILE - 2, SEE DWG. C-12

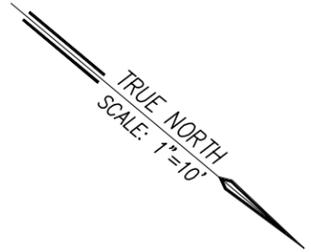
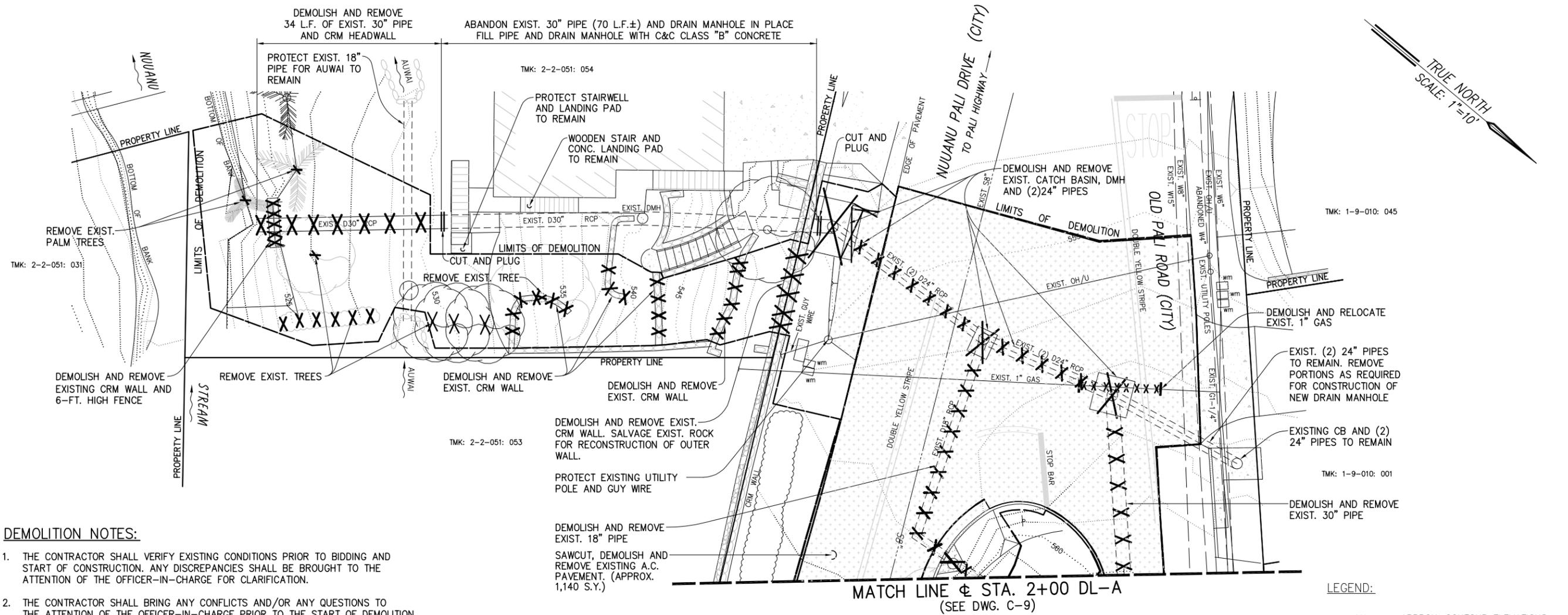
FOR TEMP. EROSION CONTROL PLAN - 3, SEE DWG. C-7
 FOR DEMOLITION PLAN - 3, SEE DWG. C-10
 FOR PLAN AND PROFILE - 3, SEE DWG. C-13

FOR TEMP. EROSION CONTROL PLAN - 1, SEE DWG. C-5
 FOR DEMOLITION PLAN - 1, SEE DWG. C-8
 FOR PLAN AND PROFILE - 1, SEE DWG. C-11

GENERAL PLAN
 SCALE: 1" = 20'

FIGURE 3

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION			
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII			
GENERAL PLAN			
DESIGN: BTF	APPROVED:	DRAWING NO. C-4	
DRAWN: NGA		SHEET 5	
CHECKED: RMA		OF 31 SHEETS	
DATE: JUNE 2013	CHIEF, CIVIL DIVISION, DDC	DATE	
JOB NO. 33-13	FILE	DRAW	FOLDER
			NUMBER



DEMOLITION NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING AND START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OFFICER-IN-CHARGE FOR CLARIFICATION.
2. THE CONTRACTOR SHALL BRING ANY CONFLICTS AND/OR ANY QUESTIONS TO THE ATTENTION OF THE OFFICER-IN-CHARGE PRIOR TO THE START OF DEMOLITION. ANY REMEDIAL WORK RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO, SHALL BE PAID FOR BY THE CONTRACTOR AT NO COST TO THE CITY.
3. ALL EXISTING IMPROVEMENTS AND UTILITIES THAT ARE TO REMAIN WITHIN THE DEMOLITION AND CONSTRUCTION AREAS SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR DURING HIS OPERATIONS, UNLESS OTHERWISE NOTED. ANY REMEDIAL WORK RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO, SHALL BE PAID FOR BY THE CONTRACTOR AT NO COST TO THE CITY.
4. UNLESS OTHERWISE NOTED, BACKFILL AND COMPACT ALL VOIDS AND DEPRESSION CAUSED BY DEMOLITION OPERATIONS WITH TOPSOIL, AS REQUIRED.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT EXPOSED BASE COURSE. ANY CONTAMINATION OR SOFT SPOTS CAUSED BY THE CONTRACTOR OPERATIONS SHALL BE STABILIZED AND REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY. ALL RECONSTRUCTION WORK SHALL BE ACCEPTED BY THE OFFICER-IN-CHARGE PRIOR TO PAVING ASPHALT.
6. SEE SITE PLAN, AND PLAN AND PROFILE-DRAIN LINE DRAWINGS FOR PROPOSED IMPROVEMENTS.
7. THE CONTRACTOR SHALL REMOVE AND DISPOSE ALL DEMOLITION MATERIALS AT NO ADDITIONAL COST TO THE CITY.
8. EXISTING UTILITY LINES SHOWN ARE BASED ON BEST AVAILABLE AS-BUILT DRAWINGS ON FILE WITH THE CITY AND COUNTY OF HONOLULU.
9. THE TOPOGRAPHIC SURVEY DID NOT LOCATE ALL TREES, HEDGES AND OTHER VEGETATION WITHIN THE PROJECT SITE. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND FIELD VERIFY ALL TREES, HEDGES AND OTHER VEGETATION THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION PRIOR TO BIDDING.
10. THE CONTRACTOR SHALL DEMOLISH AND REMOVE ALL TREES, HEDGES AND OTHER VEGETATION THAT ARE AFFECTED BY THE PROPOSED CONSTRUCTION OF THE NEW RETAINING WALL, DRAINAGE IMPROVEMENTS, GRP SLOPE PROTECTION AND UTILITY RELOCATION AS REQUIRED AND AS DIRECTED BY THE OFFICER-IN-CHARGE.
11. THE CONTRACTOR SHALL PROTECT ALL EXISTING TREES TO REMAIN.
12. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO DEMOLITION WORK.

DEMOLITION PLAN - 1
SCALE: 1" = 10'

- LEGEND:**
- 560 — APPROX. CONTOUR ELEVATIONS
 - [Patterned Box] A.C. PAVEMENT TO BE DEMOLISHED

FIGURE 4

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
DEMOLITION PLAN - 1		
DESIGN: BTf DRAWN: NGA CHECKED: RMA DATE: JUNE 2013	APPROVED: CHIEF, CIVIL DIVISION, DDC DATE:	DRAWING NO. C-8 SHEET 9 OF 31 SHEETS
JOB NO. 33-13		FILE ___ DRAW ___ FOLDER ___ NUMBER

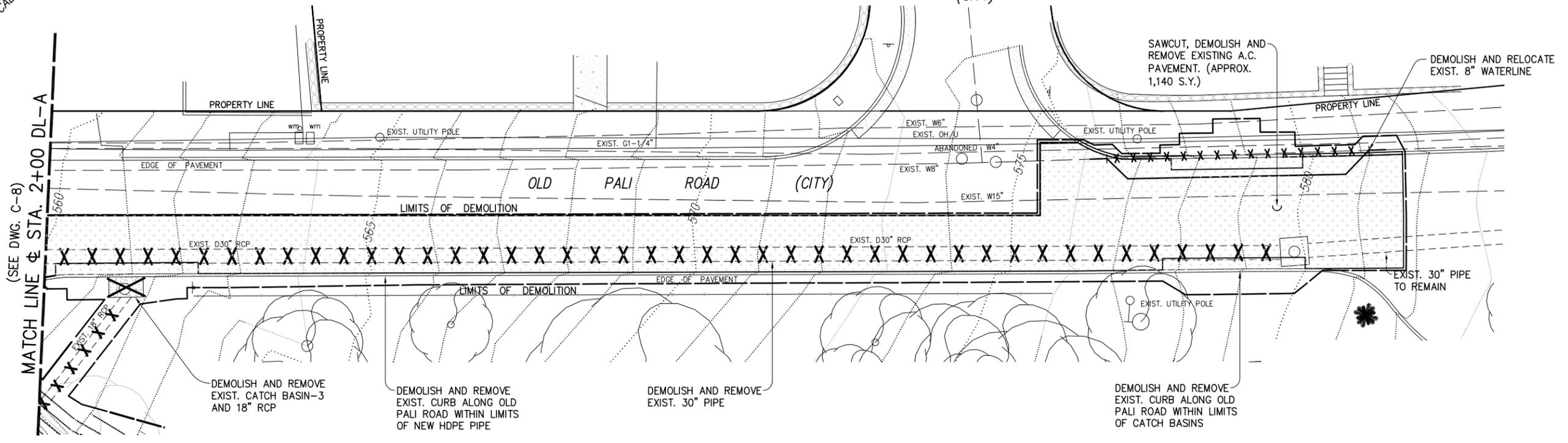


TMK: 1-9-009: 069

TMK: 1-9-009: 068

PALIMALU PLACE (CITY)

TMK: 1-9-009: 055



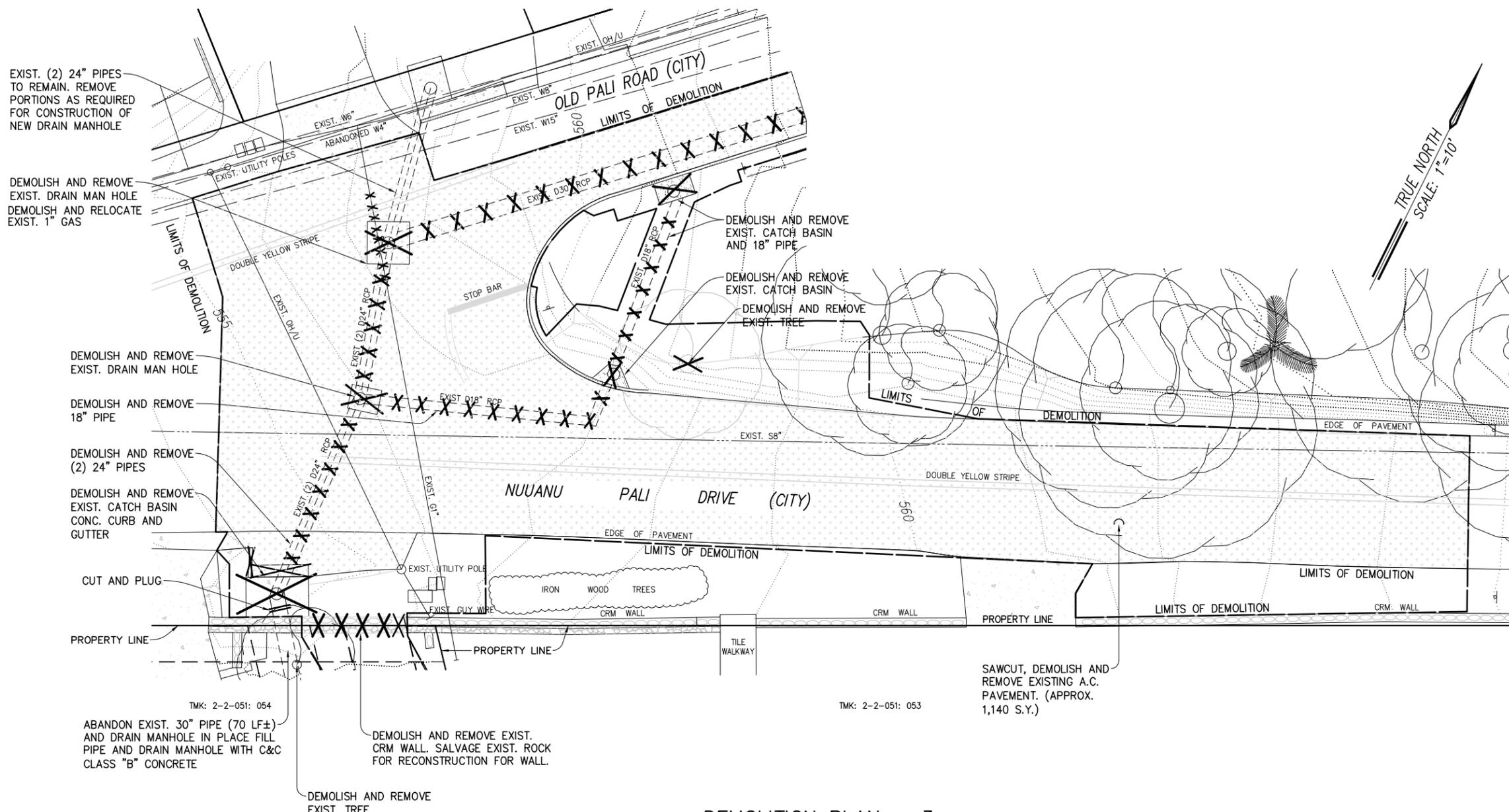
DEMOLITION PLAN - 2
 SCALE: 1" = 10'

LEGEND:

- APPROX. CONTOUR ELEVATIONS
- A.C. PAVEMENT TO BE DEMOLISHED

FIGURE 5

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
DEMOLITION PLAN - 2		
DESIGN: BTF	APPROVED:	DRAWING NO. C-9
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 10
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW FOLDER NUMBER



DEMOLITION PLAN - 3
SCALE: 1" = 10'

- LEGEND:**
- 560 — APPROX. CONTOUR ELEVATIONS
 - A.C. PAVEMENT TO BE DEMOLISHED

FIGURE 6

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
DEMOLITION PLAN - 3		
DESIGN: BTF	APPROVED:	DRAWING NO. C-10
DRAWN: NGA		SHEET 11
CHECKED: RMA	CHIEF, CIVIL DIVISION, DDC	DATE
DATE: JUNE 2013		OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW FOLDER NUMBER

TMK: 2-2-051: 054
 ABANDON EXIST. 30" PIPE (70 LF±)
 AND DRAIN MANHOLE IN PLACE FILL
 PIPE AND DRAIN MANHOLE WITH C&C
 CLASS "B" CONCRETE

DEMOLISH AND REMOVE EXIST.
 CRM WALL. SALVAGE EXIST. ROCK
 FOR RECONSTRUCTION FOR WALL.

DEMOLISH AND REMOVE
 EXIST. TREE

SAWCUT, DEMOLISH AND
 REMOVE EXISTING A.C.
 PAVEMENT. (APPROX.
 1,140 S.Y.)

EXIST. (2) 24" PIPES
 TO REMAIN. REMOVE
 PORTIONS AS REQUIRED
 FOR CONSTRUCTION OF
 NEW DRAIN MANHOLE

DEMOLISH AND REMOVE
 EXIST. DRAIN MAN HOLE
 DEMOLISH AND RELOCATE
 EXIST. 1" GAS

DEMOLISH AND REMOVE
 EXIST. DRAIN MAN HOLE

DEMOLISH AND REMOVE
 18" PIPE

DEMOLISH AND REMOVE
 (2) 24" PIPES

DEMOLISH AND REMOVE
 EXIST. CATCH BASIN
 CONC. CURB AND
 GUTTER

CUT AND PLUG

PROPERTY LINE

PROPERTY LINE

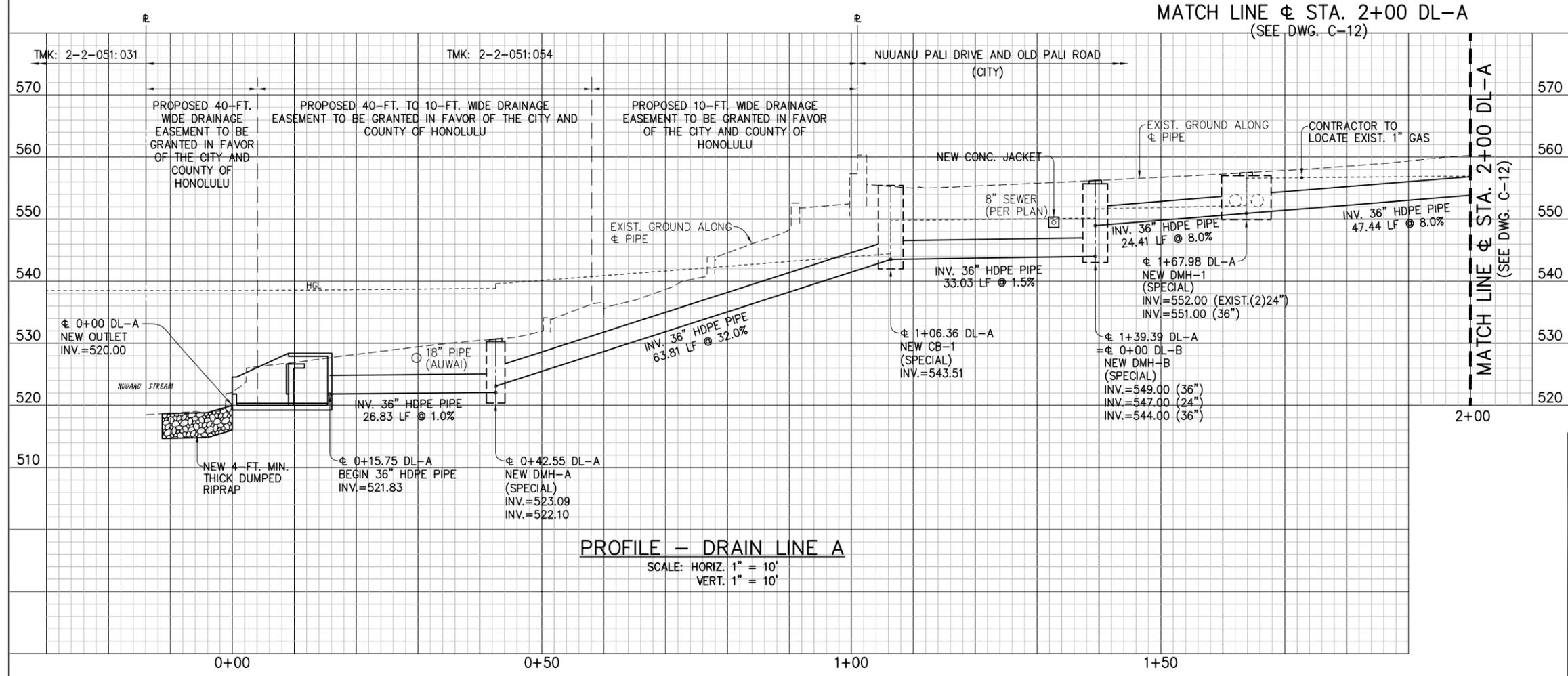
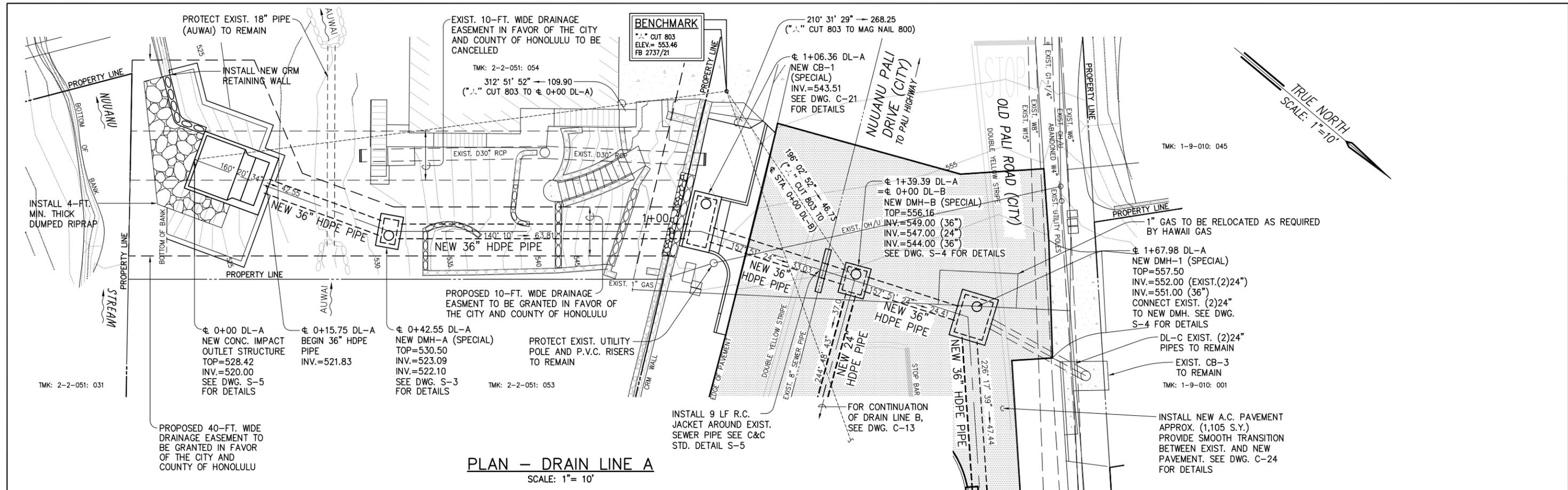
PROPERTY LINE

LIMITS OF DEMOLITION

OLD PALI ROAD (CITY)

NUUANU PALI DRIVE (CITY)

TRUE NORTH
 SCALE: 1" = 10'



LEGEND:

- 545 --- APPROX. CONTOUR ELEVATIONS
- [Hatched Box] NEW A.C. PAVEMENT (CITY R.O.W.)

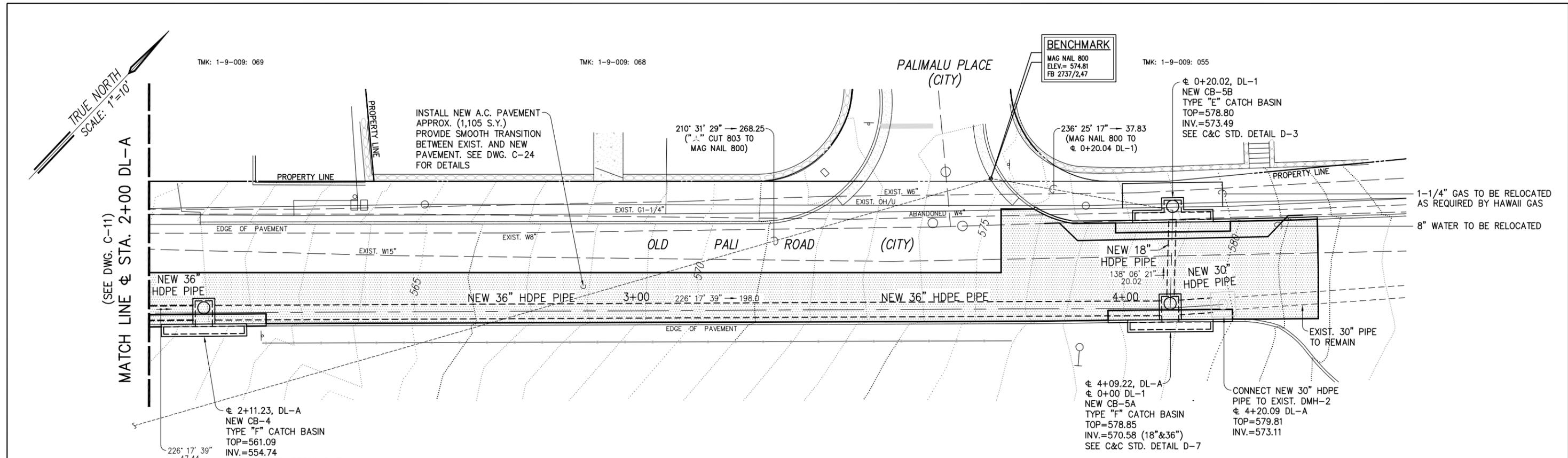
FIGURE 7

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

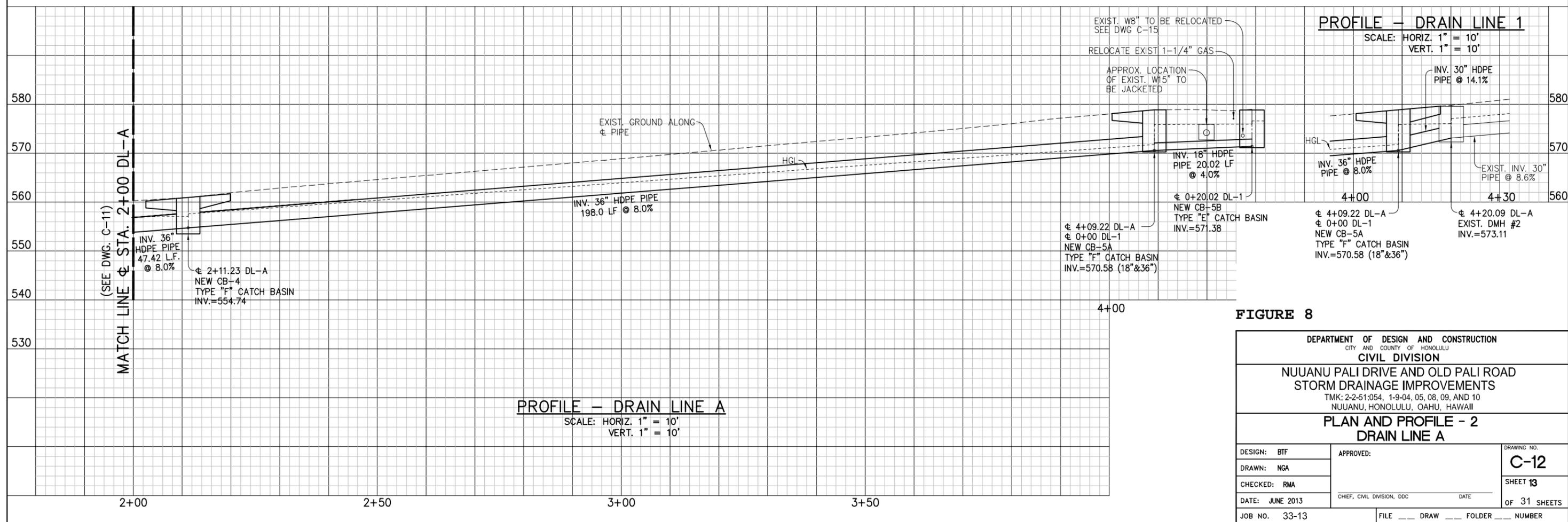
NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

**PLAN AND PROFILE - 1
DRAIN LINE A**

DESIGN: BTF	APPROVED:	DRAWING NO. C-11
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 12
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE:	
JOB NO. 33-13	FILE ___ DRAW ___ FOLDER ___ NUMBER	



PLAN - DRAIN LINE A
SCALE: 1" = 10'



PROFILE - DRAIN LINE A
SCALE: HORIZ. 1" = 10'
VERT. 1" = 10'

PROFILE - DRAIN LINE 1

SCALE: HORIZ. 1" = 10'
VERT. 1" = 10'

FIGURE 8

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
PLAN AND PROFILE - 2 DRAIN LINE A		
DESIGN: BTF DRAWN: NGA CHECKED: RMA DATE: JUNE 2013 JOB NO. 33-13	APPROVED: _____ CHIEF, CIVIL DIVISION, DDC DATE: _____	DRAWING NO. C-12 SHEET 13 OF 31 SHEETS FILE ___ DRAW ___ FOLDER ___ NUMBER

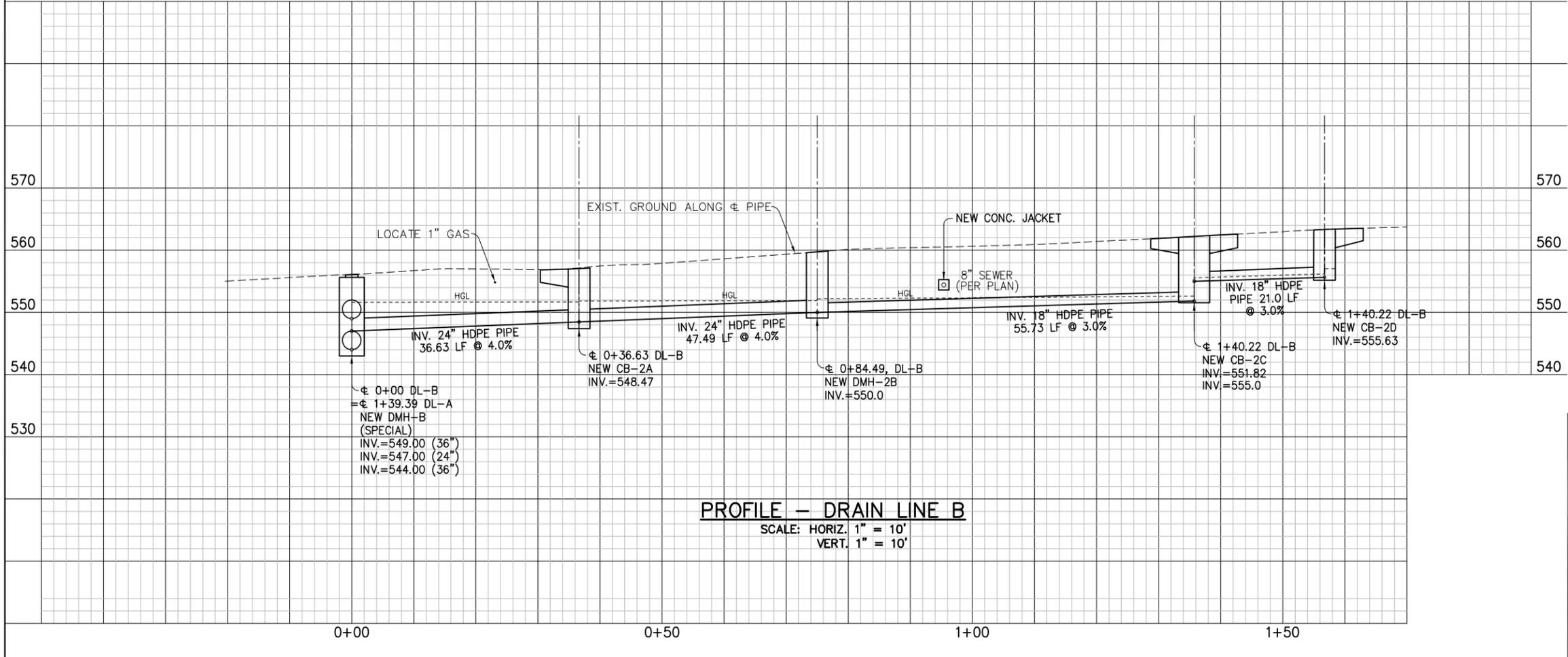
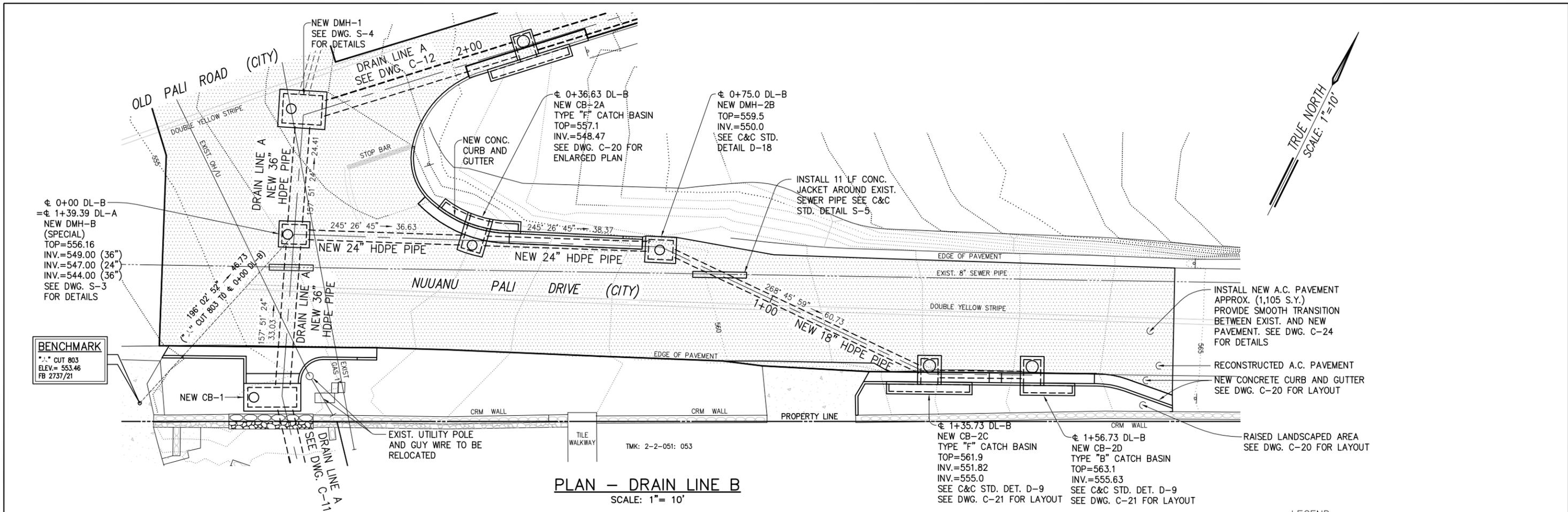


FIGURE 9

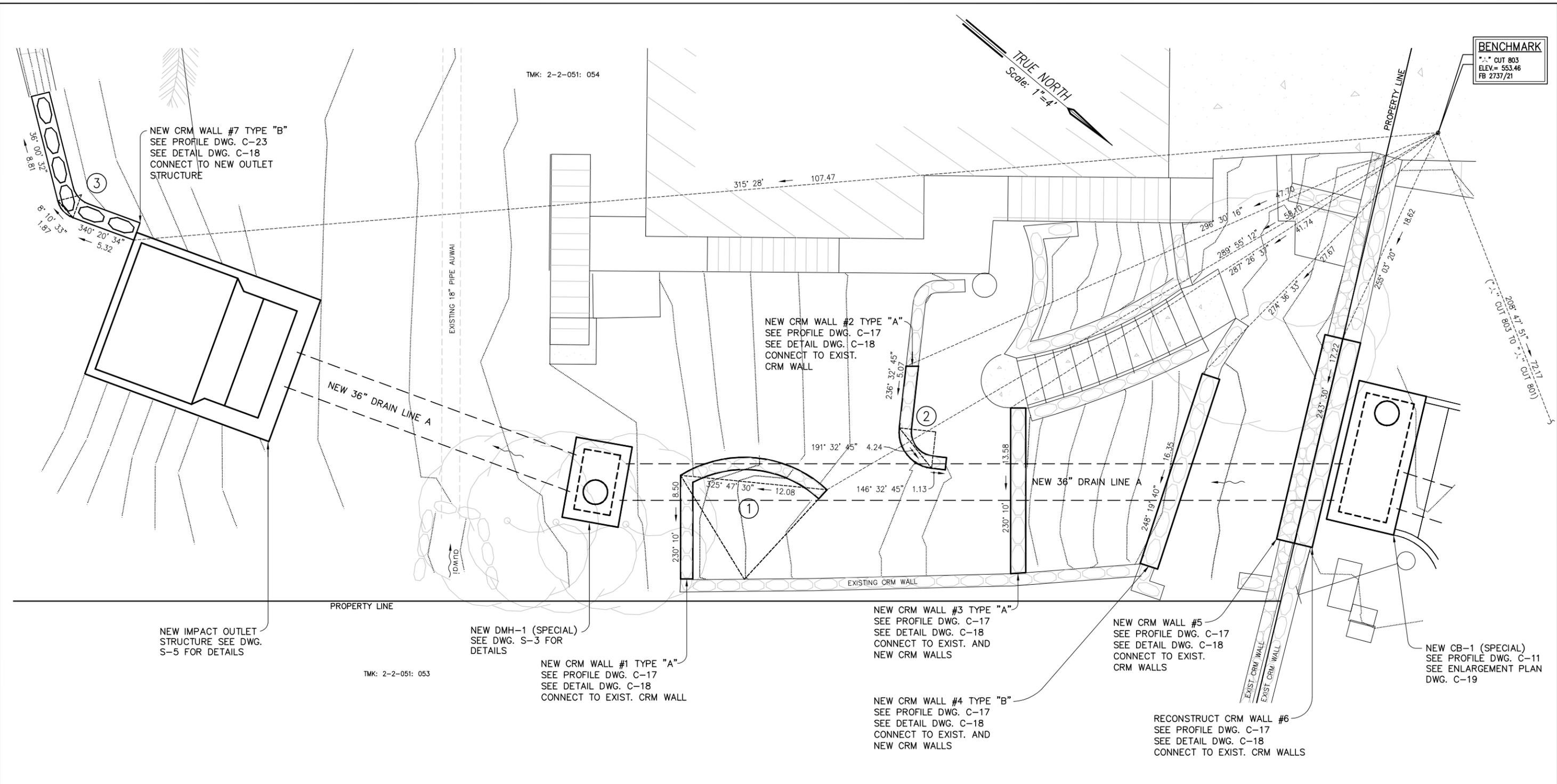
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

**PLAN AND PROFILE - 3
DRAIN LINE B**

DESIGN: BTF	APPROVED:	DRAWING NO. C-13
DRAWN: NGA		SHEET 14
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	CHIEF, CIVIL DIVISION, DDC	DATE
JOB NO. 33-13	FILE	DRAW FOLDER NUMBER

BENCHMARK
 "A" CUT 803
 ELEV.= 553.46
 FB 2737/21



CURVE DATA

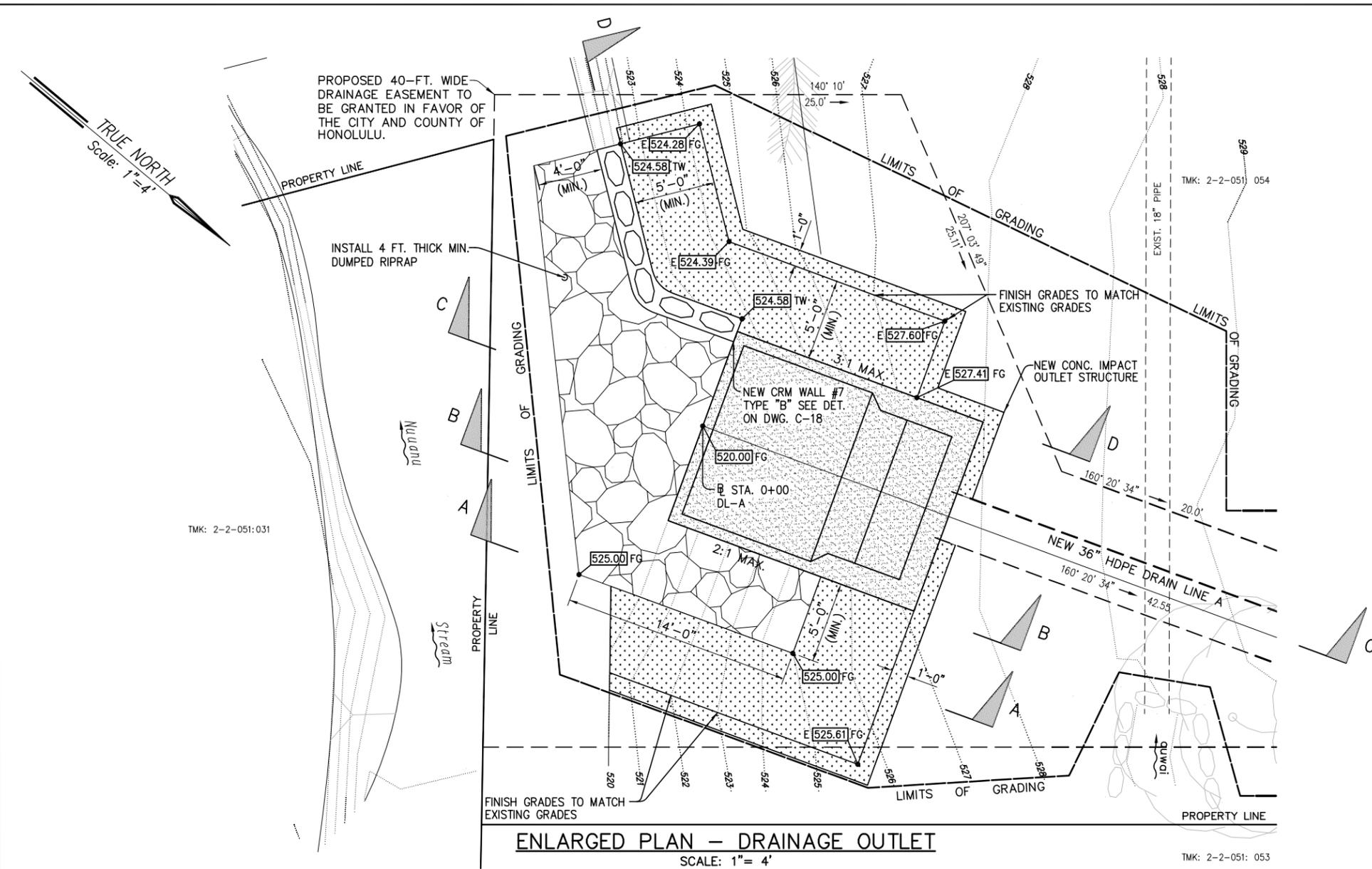
	①	②	③
Δ	74' 18' 24"	90' 00'	55' 39' 58"
Δ/2	37' 9' 12"	45' 00'	27' 49' 59"
R	10.00	3.00	2.00
T	7.58	3.00	1.06
C	12.08	4.25	1.87
Lc	12.97	4.73	1.94

WALL RECONSTRUCTION PLAN

SCALE: 1"= 4'

FIGURE 10

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
WALL RECONSTRUCTION PLAN		
DESIGN: BTF	APPROVED:	DRAWING NO. C-16
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 17
CHECKED: RMA		DATE
DATE: JUNE 2013	DATE	OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER



ENLARGED PLAN - DRAINAGE OUTLET

SCALE: 1" = 4'

TMK: 2-2-051: 053

NOTES:

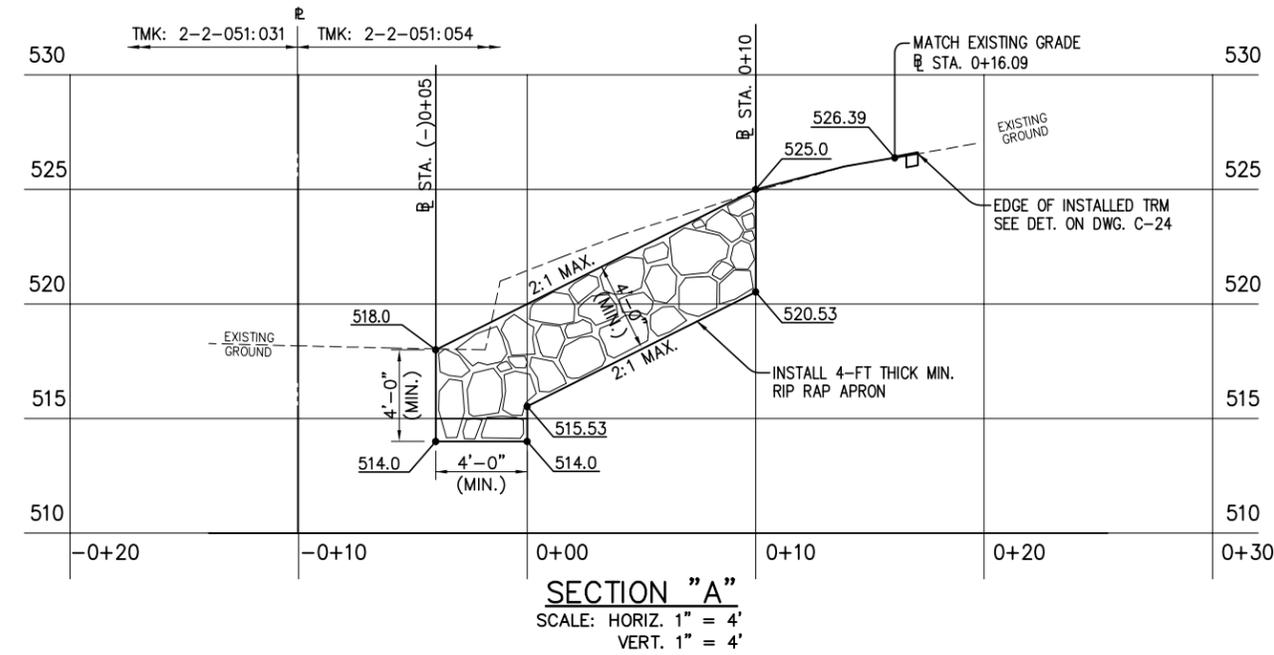
1. REMOVE AND DISPOSE EXISTING TREES AS REQUIRED FOR CONSTRUCTION OF THE OUTLET IMPROVEMENTS.
2. SEE DWG C-23 FOR SECTIONS

DUMPED RIPRAP GRADATION

% PASSING	STONE SIZE (FT.)	
D ₁₀₀	3.5	TO 4.0
D ₈₅	2.8	TO 3.3
D ₅₀	2.35	TO 2.7
D ₁₅	0.95	TO 1.4

LEGEND:

- E 523.56 FG NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
- 523.56 FG NEW FINISH SPOT GRADE
- 524.58 TW NEW TOP WALL FINISH GRADE ELEVATION
- [Dotted Pattern] NEW TURF REINFORCEMENT MATTING
- [Stippled Pattern] NEW CONC. CURB AND GUTTER



SECTION "A"

SCALE: HORIZ. 1" = 4'
VERT. 1" = 4'

FIGURE 11

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION		
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII		
ENLARGED PLAN - DRAINAGE OUTLET		
DESIGN: BTF DRAWN: NGA CHECKED: RMA DATE: JUNE 2013	APPROVED: _____ CHIEF, CIVIL DIVISION, DDC DATE: _____	DRAWING NO. C-22 SHEET 23 OF 31 SHEETS
JOB NO. 33-13		FILE ___ DRAW ___ FOLDER ___ NUMBER

III. DESCRIPTION OF ANTICIPATED IMPACTS AND MITIGATION MEASURES

A. Environmental Setting

The project site consists of portions of the Old Pali Road and Nuuanu Pali Drive owned by the City and County of Honolulu, and a privately owned single-family dwelling parcel located at 3659 Nuuanu Pali Drive. The area is predominately occupied by single-family dwellings located on lots of 10,000 or larger with two-lane roadways.

The project area is characterized as tropical and is subject to more rainfall than the lower areas of Nuuanu. While most areas are landscaped, the triangular parcel located at the intersection of Old Pali Road and Nuuanu Pali Drive is covered with introduced trees. Concrete catch basins are located on the Daimondhead side of Old Pali Road and Old Pali Drive. Portions of Old Pali Road are also curbed.

Nuuanu Stream in the vicinity of the project improvements is a perennial stream with banks that have been landscaped by property owners. The stream banks in the area are either natural or hardened with rocks. A small auwai, or water irrigation channel is located near the outlet structure but the proposed improvements are not expected to permanently impact the auwai.

Photo 2: View of auwai within TMK: 2-2-051: 054



Source: Environmental Communications, Inc.

The project site is not a listed scenic resource nor does it serve as a natural public resource as the stream and banks are under private ownership. The area is fully developed and no additional use or intensity of use will result from the proposed improvements.

Photo 3: Upstream View of Project Site (Mauka Direction)



Source: Environmental Communications, Inc.

B. Surrounding Uses

The area surrounding the project site is characterized by single-family dwelling use. While fully developed, the surrounding areas are generally of low intensity use and residential in character. The proposed improvements are consistent with the immediate surroundings as well as the general character of the entire district.

C. Environmental Considerations

1. Geological Characteristics

Topography

The project improvement areas are located on gently sloping lands within Nuuanu Valley. The valley slopes from north to south and in the project vicinity, the project site slopes from west to east towards Nuuanu Stream. The stream serves as the major drainageway for Nuuanu Valley and is relatively narrow with a

typical width of 10 to 15 feet in the project area. As previously stated, the stream banks are typically landscaped with lawn grass and trees and other typical landscaping features. The stream banks are unlined however portions of the stream appear to have large rocks installed to stabilize the stream banks. Settling and shallow sink holes have been noted in the project area.

Portions of the roadway are curbed where drainage inlets are located while other areas are typically grassed and slope down to the roadway paving. This juncture serves as the runoff swale which ultimately enters Nuuanu Stream through the existing outlet structure.

The private property affected by the proposed improvements slopes from the street level down to the stream with an approximate 20-foot elevation change. A series of CRM retaining walls, slabs and stairs located on the private property will be removed when the new drain line and structures are installed. A few existing trees and palm bushes must be removed in favor of the new easement and to install the new drainage system. Replacement CRM retaining walls and a new stairwell will be constructed after installation of the new drain line and outlet structure. The outer wall will be reconstructed using the salvaged building materials. All exposed or disturbed areas will be grassed as part of the site restoration work.

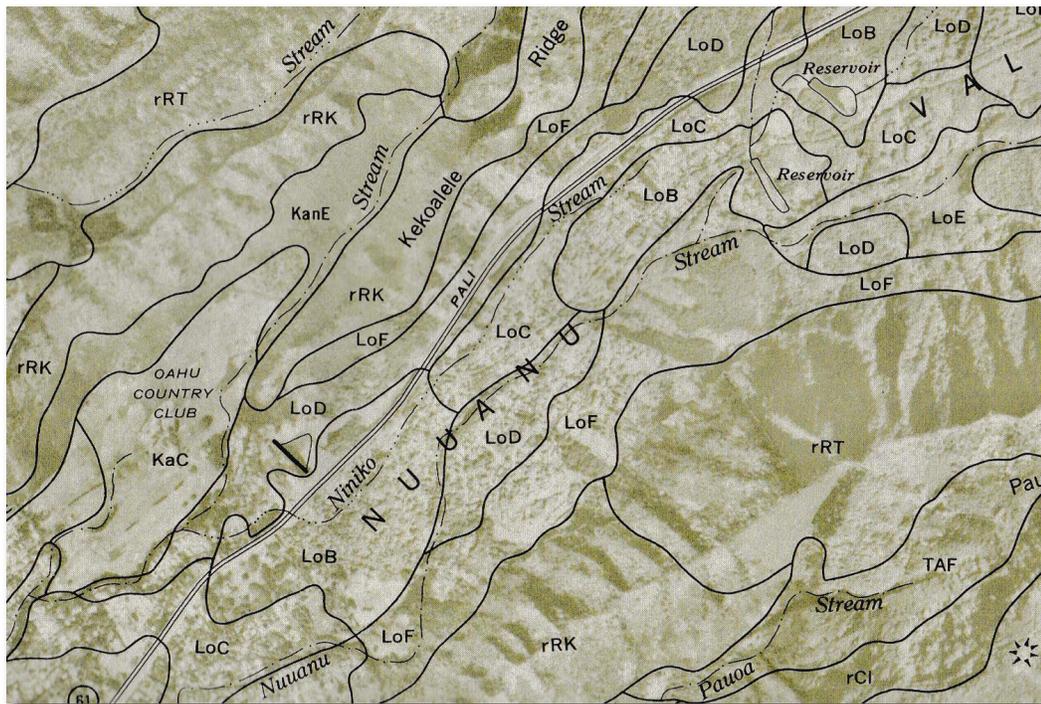
Climate

The geography of the Nuuanu area is typically warm and tropical in climate. Prevailing trade winds arrive from the northeast. According to the National Weather Service Honolulu Office, over a period of 30 years, normal monthly high temperatures range from 80 degrees in January to a high of 89 degrees in August for an average of 84 degrees. Normal month low temperatures range from a low of 65 degrees in February and a high of 74 degrees in August for a monthly average of 70 degrees. The mean annual precipitation in the project area is 108 inches typically ranging from a low of 6.44 inches in June to a high of 11.81 inches in March. For comparison, the annual average rainfall in Honolulu is 70 inches per year.

USDA Soil Survey Report

According to panel 61 of the *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* by the US Department of Agriculture Soil Conservation Service, the project site is located primarily on soils classified as Lolekaa silty clay, 8 to 15 percent slopes (LoC) over the majority of the site, and Lolekaa silty clay 40 to 70 percent slopes (LoF) along the stream banks (Figure 12). This soil series consist of well-drained soils lain over a deeper substratum of loam and gravel. Permeability is moderately rapid and runoff is slow, and erosion hazard is slight. This land type is used for urban development including industrial facilities.

Figure 12: Soil Survey Map



US Department of Agriculture Soil Conservation Service

Detailed Land Classification

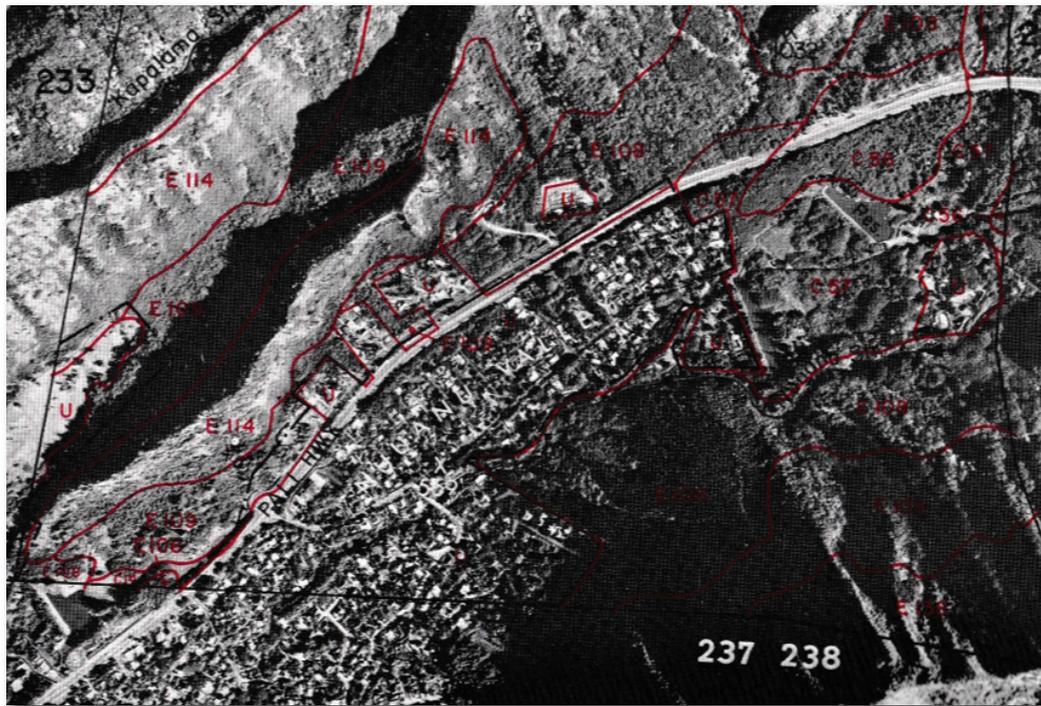
The project area is designated as Urban on Map No. 224 of the *Detailed Land Classification – Island of Oahu* published by the University of Hawaii Land Study Bureau. The area is presently developed and it is unlikely that the land will revert back to agricultural use or other non-urban uses (Figure 13: Land Classification Map.)

Air Quality and Noise Environment

The ambient air quality of the project site is typical of the low-density residential character of the site. No point source pollution sources have been identified in the general area and typical trade winds ensure that air quality remains within acceptable standards as recorded by the Department of Health air quality monitors.

Air quality impacts from the construction and operation of the drainage improvements are expected to be minimal to insignificant. During the construction period, gasoline or diesel powered heavy equipment will be required for the demolition and construction of the improvements. Air quality degradation from the operation of this equipment will be negligible and temporary. No long-term air impacts will occur as a result of the project.

Figure 13: Land Classification Map



Source: University of Hawaii Land Study Bureau

The noise environment will be affected during the construction period. Heavy equipment will be used during demolition as well as during the installation of the drain line and appurtenant infrastructure. All activities will continue to adhere to State Department of Health community noise standards. Upon completion of all construction related activities, no long-term noise impacts are expected.

2. Water Resources

Hydrologic Hazards and Resources

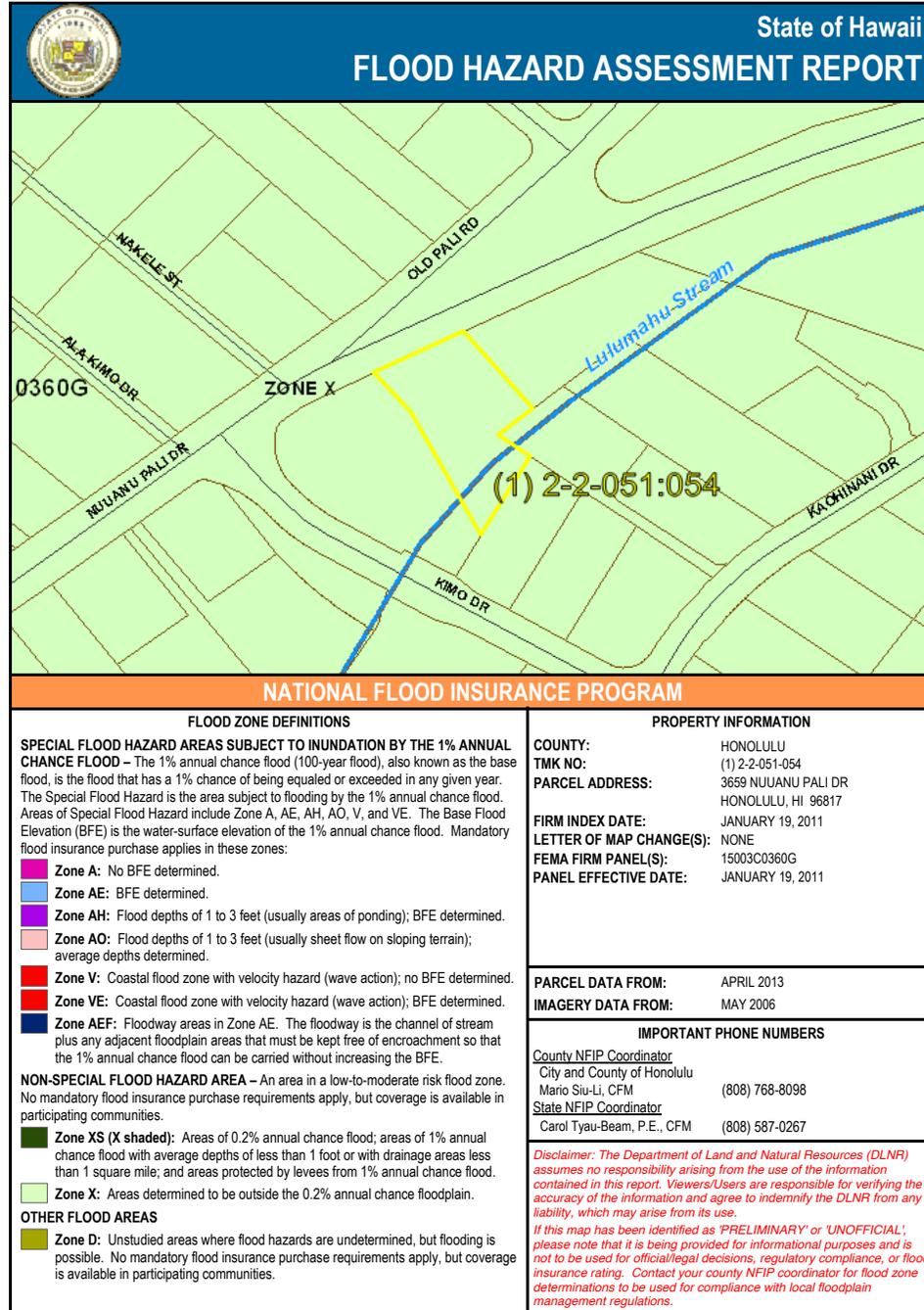
According to Panel 15003C0360G of the Federal Emergency Management Agency Flood Insurance Rate Map, the entire project area is located in Zone X. This flood zone is classified as a non-special flood hazard area that has less than 0.2% chance of flooding annually (Figure 14).

Nuuanu Stream currently does not serve any agricultural uses in Nuuanu Valley but serves as an important natural drainage way. It is unlikely that any agricultural uses will occur as the valley and areas near the mouth of Nuuanu Stream are heavily urbanized and designated for urban uses only.

Prior to the urbanization of the area, the project site and the vicinity were in agricultural use primarily as pasture lands and smaller scale taro farming around

the stream. The project site contains a remnant auwai which starts immediately mauka of the project parcel and exits immediately below the project parcel. The current owner uses the auwai as a fishpond for ornamental koi.

Figure 14: Flood Hazard Map



Source: Department of Land and Natural Resources

Special Management Area

The project site is not located within the Special Management Area (SMA).

Water Quality

The project will not adversely affect water quality as the proposed improvements intend to improve drainage in the area as well as minimize stream impacts due to erosion. No new storm water will be introduced into Nuuanu Stream. Only the method of conveyance will be changed. The addition of the riprap impact outlet structure will minimize erosion and potentially improve water quality during storm events.

The new drainage system will collect water more efficiently by collecting runoff before it accumulates additional sediment from the shoulder areas. Additionally, the current system is causing soil loss within the private property site, adding sediment to the stream.

3. Archaeological, Cultural, Botanical and Faunal Resources

A report titled *Archaeological, Ethnographic, and Biological Survey of TMK: (1) 2-2-052: 054, Nu'uanu Ahupua'a, Kona District, Island of O'ahu, Hawai'i* was prepared by Garcia and Associates in December 2007. The findings of this report are summarized and excerpted in the following section and the report in its entirety can be found in Appendix B.

Archaeological Resources

No surface archaeological remains were observed along the surveyed corridor. Inspection of the surrounding area and consultation with the landowner led to the discovery of an existing auwai running parallel with the stream and crossing (perpendicular to) the drainage easement. The auwai is known as Pahoa Auwai and is shown on historic maps. This auwai segment is part of a much larger system of auwai which are well known and recorded.

Pahoa Auwai begins at the mauka end of TMK: 2-2-051:053, which is the parcel adjacent to the current project area on the north side. The auwai feeds from Nuuanu Stream and continues roughly southwest, with some portions flowing through underground tunnels. The auwai continues through the project parcel and beyond, paralleling Nuuanu Stream and Nuuanu Pali Drive. The makai end of Pahoa Auwai passes near Queen Emma's Summer Palace and ends at TMK: 2-2-033:009, beyond Laimi Road, where it empties into Nuuanu Stream.

Although the auwai is maintained in its original state in some sections, the portion running through the project site is highly modified, apparently by previous drainage improvements, and now runs through underground piping. Any

traditional wetland fields that the auwai might have irrigated are no longer visible on the surface in the project parcel. Subsurface wetland deposits, however, might be present along either side of the auwai.

Planned improvement to this drainage line will impact the auwai, although, due to previous modifications, the impact will not substantially alter the integrity of the auwai, provided the auwai retains its original flow following the completion of work. The current landowner, as well as local community members (particularly the auwai study group) have demonstrated a high level of interest in maintaining functioning auwai in Nuuanu Valley.

In the unlikely event that any archaeological artifacts are uncovered, all work will cease and the Department of Land and Natural Resources Historic Preservation Division will be notified for appropriate action.

Cultural and Historic Resources

The lands within the Nuuanu Storm Drainage project area were heavily impacted by the historic activities of the 18th, 19th and 20th centuries. Many cultural sites or resources would have been destroyed or damaged by warfare, ranching, urban development and their related activities. However, there are still cultural resources related to traditional agriculture (former lo'i) on project lands that are typical of traditional ahupuaa lifestyle and use, albeit heavily modified remnants. This resource is in an impact zone and will need to be assessed to determine the extent/type of protective buffer.

There are no current cultural practices in the project area and no need for access, therefore, no impact on cultural practices.

The Nuuanu Stream and Pahoa Auwai are both cultural and historical features. There is concern regarding storm drainage improvement activity and the auwai section in the property owner's back yard. Suggested measures should be considered to assure that the auwai (land) will not be compromised any more than it already has been, and that auwai (waters) downstream will not be jeopardized. It is also recommended that a buffer is provided to the lo'i (now fishpond) to assure that it is not damaged.

Flora

The roadway portions of the project site are covered with asphalt paving. Various weedy species were found along the boundary and within cracks in the paved surfaces. These are considered noxious weeds and will be removed prior to any project improvements. No rare, threatened or endangered species of flora were observed within the project site.

The private property affected is heavily landscaped with various ornamental and landscaping plants. The flat areas are grassed and landscaped with moss rock with

plants and trees including guava, kukui, coconut, palm, ginger, various ferns, bromeliads, monstera, papyrus, and ornamental flowers.

Fauna

The site does not serve as an endangered wildlife habitat although avifauna, feral cats, and rodents may be found on-site. Interviews with the property owner indicated that native species are not found within the auwai or stream due to introduced or invasive feeder fish and ducks that feed in the area. Hawaiian fresh water clams were observed within the stream and the auwai is presently stocked with Koi fish. 'O'opu, 'opae and crawfish were formerly found on the site but have been foraged out of existence by large mouth bass, catfish, red devil cichlids and feral ducks.

4. Infrastructure and Utilities

The proposed improvements are not expected to have a significant impact on existing infrastructure and utilities aside from the municipal storm drain system. No sewer, water, electrical or other utilities will be impacted or require relocation. No disruption in utility services is anticipated. During the demolition and construction phases, storm drainage in the area will be temporarily impacted however extensive mitigation measures have been developed and are shown in the plans attached in Appendix A.

Vehicular Access and Traffic Conditions

Work will occur within and along Old Pali Road and Nuuanu Pali Drive. During the construction period, portions of the existing roadway will be demolished, removed, and trenched for the new drain lines, manholes and catch basins. Upon installation of these improvements, the roadway will be resurfaced and restored.

During the construction period, traffic diversion will be required. A permit for work with the roadway will be obtained prior to the commencement of work and per applicable regulations, work within the street will be conducted between the hours of 8:30 am and 3:30 p.m. Appropriate signage, and an off-duty police officer will be provided for additional traffic management, and access will be maintained for through traffic and affected driveways.

Water

The proposed improvements will not have any impact on municipal potable water resources.

Wastewater

The municipal wastewater system will not be impacted by the proposed improvements.

Drainage

The proposed action consists of drainage related improvements and are the primary subject of this Environmental Assessment document.

The existing storm drain system is in need of improvement. Presently, the existing catch basins and the storm drain pipes need to be improved to provide improved capacity as well as a safer and environmentally preferred exit structure.

Solid Waste

The project area is served by the municipal refuse service. The project will have no impact on this service. Any construction waste associated with the project will be removed by the project contractor and disposed at an approved waste disposal site.

Telephone and Electrical Services

Telephone and electrical services will not be affected by the proposed improvements.

5. Public Facilities

The proposed project will not have any significant impact on public facilities including schools, police, and fire or emergency medical services.

The Nuuanu Fire Station Number 25 provides fire protection and first response emergency and rescue service to the project area. The station is located at 115 Wyllie Street, approximately one and a half miles from the project site. Response time to the site is approximately 5 minutes. An engine company serves this station.

Ambulance service for the project vicinity is provided by City and County of Honolulu Emergency Medical Service Charlie 1 unit operating out of Kuakini Medical Center in Liliha. Response time to the project area is approximately 5 to 10 minutes.

Police service in the project area is part of the Honolulu Police Department's District 5, Beat 573. The district's administrative offices are located at the Kalihi Police Station.

D. Social and Economic Characteristics

The proposed action will not have significant social impact to the surrounding area. The installation and completion of the proposed improvements will result in a safer environment with improved roadway drainage and a significant decrease in drainage related impacts to the private residence located adjacent to the drainage easement and outlet.

The project will have some beneficial economic impacts. The construction of the improvements will create short-term employment, the purchase of goods and services, the generation of excise and income taxes, and other secondary and tertiary effects as a result of the project expenditures.

In the short-term, some traffic disruption will occur as a result of the improvements in and along the Old Pali Road and Nuuanu Pali Drive roadways. The selected contractor will be required to provide appropriate traffic controls to ensure safe passage around the work areas and also to ensure that access to the private driveways are maintained.

The long-term operations of the drainage infrastructure will provide a safer environment for the entire project area, and the private property on which the drain outlet is located.

E. Relationship to Plans, Codes and Ordinances

The private property site is zoned R-10 for residential use as specified under the City and County of Honolulu Zoning Map. Old Pali Road and Nuuanu Pali Drive are not specifically zoned but are recognized on the zoning maps as City and County of Honolulu roads.

The City and County of Honolulu *General Plan Objectives and Policies* does not specifically address storm water drainage however under Section V. Transportation and Utilities, Objective C “To maintain a high level of service for all utilities”, Policy 1 and 2 have general applicability. These state respectively that the City should maintain existing utility systems in order to avoid major breakdowns, and provide improvements to utilities in existing neighborhoods to reduce substandard conditions. The proposed project is consistent with these general policies in that the project will maintain and improve existing drainage infrastructure.

The State Land Use Boundary Maps show the project locations to be in Urban use. The project is not located within the Special Management Area (SMA).

The project is also consistent with the objectives of the Hawaii State Plan particularly with respect to the objectives and policies of the economy. The provided services support trade, visitor and transportation industries and are a critical service to Hawaii.

The *Primary Urban Center Development Plan for Honolulu* Chapter 4: Infrastructure and Public Facilities, Section 4.6 relating to Stormwater Systems states that stream and estuarine habitats should be preserved and that best management practices should be implemented. To this end, the proposed actions will implement best management practices (BMPs) as practicable and the completed project will positively affect the Nuuanu Stream by mitigating erosion with the addition of the new impact riprap lined outlet.

The proposed improvements will require a number of permits.

- Department of the Army Permit (404 Nationwide)
- Department of Health Water Quality Certification (401 WQC)
- Department of Land and Natural Resources Stream Channel Alteration Permit (SCAP)
- Office of State Planning Coastal Zone Management Certification (CZM)
- City and County of Honolulu Building Permits

Work on the proposed improvements will not commence until all permits have been obtained and the environmental assessment process is completed.

F. Probable Impact on the Environment

The proposed improvements will not result in any change in use or intensity of the project area. The proposed action is a long-term infrastructure improvement project that will improve the safety in the area as well as minimize any adverse impacts to Nuuanu Stream. When completed, most of the improvements will not be visible and will not have any impact on use or views.

The proposed improvements will have short-term construction related impacts. Traffic will be impacted during work within and along the roadway but traffic control measures will ensure that there is no major inconveniences to local traffic. It should be noted that Old Pali Road is a dead end street so no through traffic will be impacted. Beyond the inconvenience of some minor traffic disruption and associated noise from the use of heavy equipment, no adverse long-term impacts are expected. Any traffic diversions and roadway construction must conform with applicable State and County construction regulations. Work will also be limited to daytime non-peak traffic hours.

Benefits beyond an improved drainage system is the creation of short-term and employment both on and off property, the generation of additional revenues to the State of Hawaii and City and County of Honolulu and the resultant secondary and tertiary spending and tax collections that will likely be experienced in the community.

G. Adverse Impacts Which Cannot be Avoided

Adverse impacts that cannot be avoided are generally related to short-term construction activities. These impacts can be minimized by sound construction practices, adherence to applicable construction regulations as prescribed by the Department of Health, and coordination with applicable State and County agencies.

Minor grading will be required for the construction of the project improvements. This work will create dust, noise and a minor traffic nuisance during the course of construction. Paving of the roadways will also require the use of heavy machines that will enter the project site. Traffic control measures will be used to minimize the disruption of traffic during the construction period.

H. Alternatives to the Proposed Action

Alternatives considered for the project were limited to specific drain line alignments and outlet structure design. The proposed action represents the most efficient alignment with the least invasive outlet structure that would offer adequate stream bank protection.

The no-action alternative was not considered as non-action would result in continued inadequate storm water drainage and would also exacerbate settling and erosion of the affected private property.

I. Mitigation Measures

Long-term impacts resulting from the proposed improvements are expected to be minimal or positive based upon the subject environmental assessment. Long-term air and noise impacts are not expected to change significantly after improvements are completed. Traffic conditions will not change, as there will not be any new demand for access to the project site. Short-term construction-related noise and air quality impact mitigation measures include general good housekeeping practices and avoidance of a prolonged construction period. The contractor will be directed to use best management practices (BMP) wherever applicable.

Examples of BMPs that may be implemented include watering during demolition, clearing and grubbing to control fugitive dust and the containment and controlled

release of any runoff during the construction period. All waste materials will be securely contained and appropriately disposed.

BMP and erosion control measures include the use of compost filter socks the use of a sand bag cofferdam, and the addition of a stabilized construction entrance/exit point. Compost filter socks will be used at the catch basin inlets as well as around the perimeter of work areas. A sand bag cofferdam using a 6 mil. thick polyethelene plastic barrier will be used to create a dry work area around the outlet structure. The construction ingress/egress located at the entrance to the privately owned property will be stabilized with a fabric barrier topped with large aggregate which will be removed when construction is completed.

J. Irreversible and Irretrievable Commitment of Resources

Implementation of the proposed project will result in the irreversible and irretrievable commitment of resources in the use of non-recyclable energy expenditure and labor. Materials used for new construction may have salvage value; however, it is unlikely that such efforts will be cost-effective. The expenditure of these resources is offset by gains in construction-related wages, increased tax base and tertiary spending.

IV. REASONS SUPPORTING FINDING OF NO SIGNIFICANT IMPACT

As stated in Section 11-200-12, EIS Rules, Significance Criteria: in determining whether an action may have a significant effect on the environment, every phase of a proposed action shall be considered. The expected consequences of an action, both primary and secondary, and the cumulative as well as the short-term and long-term effects must be assessed in determining if an action shall have significant effect on the environment. Each of the significance criteria is listed below and is followed by the means of compliance or conflict (if extant).

- Involves the loss or destruction of any natural or cultural resource.

The proposed action will not involve the loss or destruction of any natural or cultural resource. The project proposes to construct a new drainage system immediately adjacent to an existing storm drain line. The site of the outlet structure was previously improved and is devoid of any public accessed natural or cultural resources. The auwai that is located by the outlet structure will not be altered and will continue to function as a fishpond for the property owner.

- Curtails the range of beneficial uses of the environment.

The proposed installation will not curtail any beneficial uses of the environment. The project area is not generally used by the public nor is it used as a recreational or cultural resource by the public. Public access to the outlet site is, in fact, restricted as it is entirely located within private property.

- Conflicts with the State's long-term goals or guidelines as expressed in Chapter 343, Hawaii Revised Statutes.

The proposed action is consistent with the goals and guidelines expressed in Chapter 343, Hawaii Revised Statutes. The proposed action is triggered by the use of City and County of Honolulu owned lands and by the use of County funds. The subject Environmental Assessment has been developed in compliance with the Chapter 343.

- Substantially affects the economic or social welfare of the community or state.

The proposed action will make a positive contribution to the welfare of the County and State by creating employment during the construction period and will also benefit the State through increased tax revenue.

The long-term associated impacts of the project include safer and more stable properties around the drainage inlets, the property where the outlet structure is located, and along Nuuanu Stream in general.

- Substantially affects public health.

The proposed improvements will not have a significant effect on public health but create a safer environment. The effective conveyance of storm water discharge will minimize property damage during larger storm events. The improved outlet structure will also decrease any potential erosion along the adjacent stream banks resulting better overall downstream water quality.

- Involves substantial or adverse secondary impacts, such as population changes or effect on public facilities.

The proposed action will not produce secondary impacts resulting in population changes or significantly increase use of public facilities.

- Involves substantial degradation of environmental quality.

The proposed improvements will not involve the substantial degradation of environmental quality. In the long-term, the project will in fact, be beneficial to the surrounding and downstream areas. The improvements proposed will have short-term impact on the environment; however, this is temporary in nature.

- Cumulatively have a considerable effect upon the environment or involve a commitment for larger actions.

The proposed action is not a first phase of any larger action nor will it have a considerable effect on the environment. The project is expected to remain for the long-term and is not designed for larger expansion or other related development.

- Affect rare, threatened or endangered species, or their habitats.

The proposed action will not affect any rare, threatened or endangered species of flora or fauna. The project improvements are not anticipated to create any additional wildlife habitat. Any loss of wildlife is largely associated with introduced wildlife that are found in the project area but are not associated with the proposed action.

- Detrimentially affect air or water quality or ambient noise levels.

The proposed action is not expected to negatively impact ambient air, noise or water quality. Long-term water quality may improve as a result of decreased erosion with the new outlet structure which will incorporate an impact structure and riprap apron to reduce erosion capacity of the storm water runoff.

Minimal impacts on air, noise and water quality are anticipated during construction. These impacts will be limited by best management construction

practices and compliance with Department of Health construction mitigation standards.

- Affect scenic vistas and viewplanes identified in County or State plans or studies.

The proposed action will not affect any scenic vistas or view planes identified by the County or State.

- Require substantial energy consumption.

The project will not increase energy consumption. Energy utilization during the construction phase will increase through the use of fossil fuels used by construction vehicles. Operation of the infrastructure will not require any energy.

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

The project outlet structure is located adjacent to the Nuuanu Stream which is a natural major receiving body used for the conveyance of storm water. The stream itself is subject to overtopping of the natural stream banks during heavy storm events. The project area is located in FEMA Zone X, an area with less than 0.2% annual chance of flooding. While the low lying stream areas are subject to heavy stream flow, no habitable structures are located near the stream. Best Management Practices will be implemented to minimize or prevent erosion.

Anticipated Finding of No Significant Impact

Based on the above stated criteria, the Department of Design and Construction anticipates that the proposed project will not have any significant adverse environmental impacts and that an Environmental Impact Statement will not be required for the proposed action. This Draft Environmental Assessment will be subject to public review and prescribed by Chapter 343 Hawaii Revised Statutes.

V. LIST OF PARTIES CONSULTED PRIOR TO DEVELOPMENT OF THE DRAFT ENVIRONMENTAL ASSESSMENT

Agencies with ministerial or specific interests regarding the proposed project were contacted for their early comments regarding the proposed project.

Corps of Engineers Honolulu District
U.S. Department of the Army

Department of Health
Clean Water Branch
State of Hawaii

Department of Land and Natural Resources
State of Hawaii

Department of Planning and Permitting
City and County of Honolulu

Department of Transportation Services
City and County of Honolulu

Fire Department
City and County of Honolulu

Police Department
City and County of Honolulu

VI. LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS TO BE CONSULTED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT PROCESS

Federal

1. Department of the Army, Corps of Engineers
2. Environmental Protection Agency
3. National Ocean and Atmospheric Administration, National Marine Fisheries Service
4. US Fish and Wildlife Service

State of Hawaii Agencies

1. Dept. of Agriculture
2. Dept of Business, Economic Development and Tourism, Office of Planning
3. Dept of Health, Environmental Planning Office
4. Dept of Health, Clean Air Branch
5. Dept of Health, Clean Water Branch
6. Dept of Health, Noise, Radiation and Indoor Noise Branch
7. Dept. of Health, Office of Hazard Evaluation and Emergency Response
8. Dept. of Land and Natural Resources
Historic Preservation Division
9. Dept. of Land and Natural Resources
Division of Aquatic Resources
10. Dept. of Land and Natural Resources
District Land Office
11. Dept. of Land and Natural Resources
Office of Conservation and Coastal Lands
12. Dept. of Transportation
13. Office of Environmental Quality Control
14. Office of Hawaiian Affairs
15. University of Hawaii, Environmental Center

City and County of Honolulu Agencies

1. Board of Water Supply
2. Department of Environmental Services
3. Department of Planning and Permitting
4. Department of Transportation Services
5. Fire Department
6. Police Department

Libraries

1. Hawaii State Library
2. Kalihi Public Library

APPENDIX A

Project Drawings for Nuuanu Pali Drive and Old Pali Road Storm Drainage Improvements

CIVIL DIVISION
 DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
 JOB NO. 33-13

NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS

NUUANU, HONOLULU, OAHU, HAWAII
 TAX MAP KEY: 1-9-000, 1-9-004, 2-2-000, 2-2-051:054

PROJECT DATA

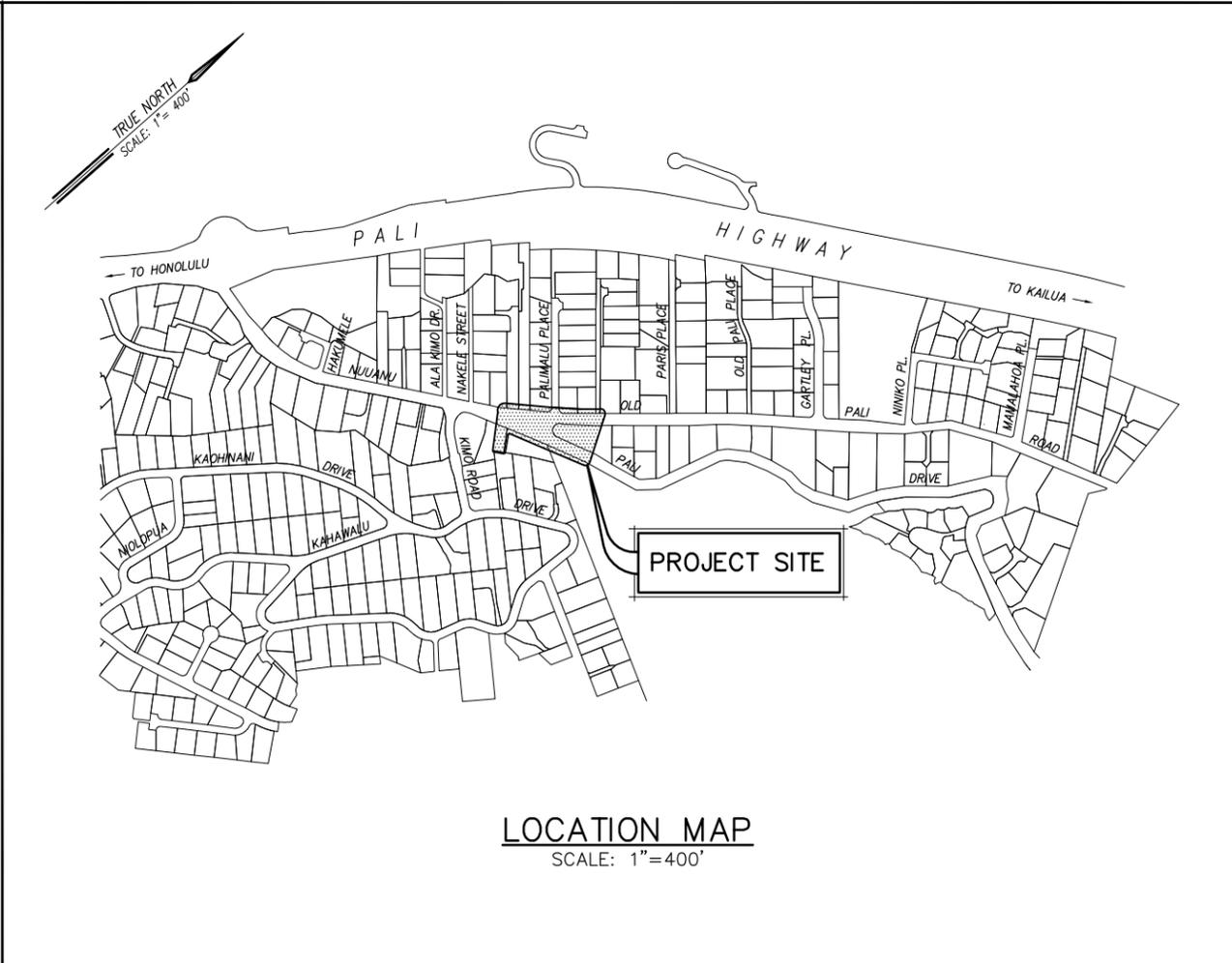
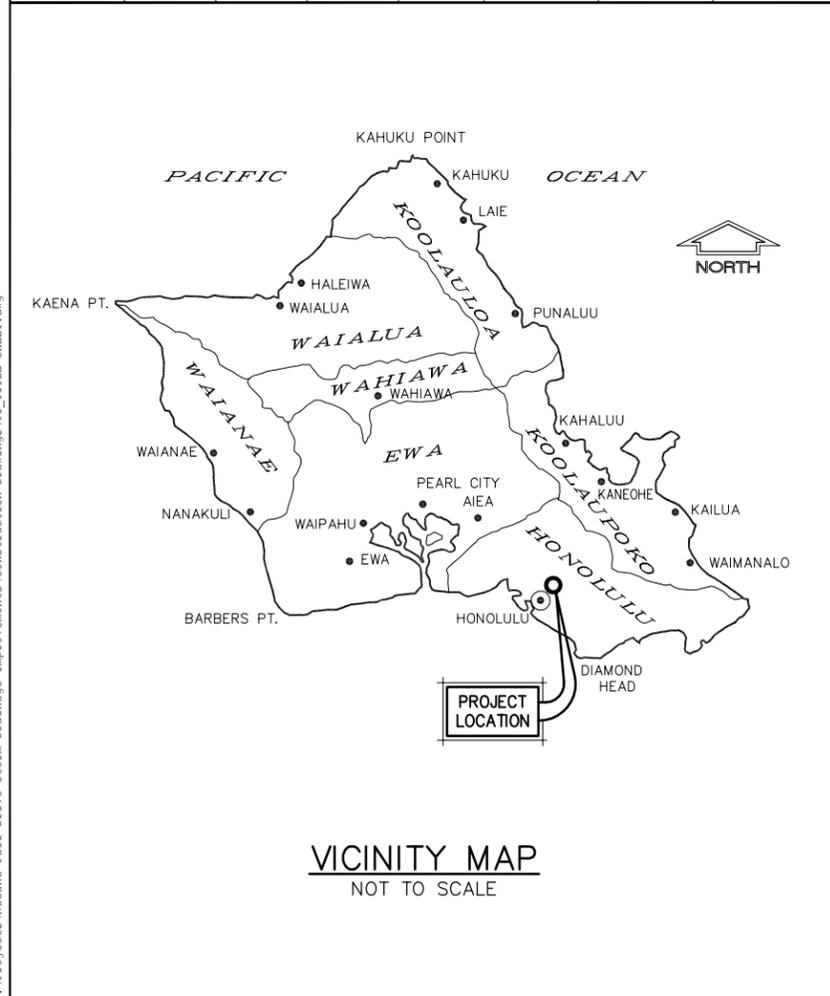
TMK	AREA, S.F.	FLOOD ZONE	HEIGHT LIMIT	SMA	SPECIAL DIST.	ZONING (LUO)	STATE LAND USE
1-9-004	NO	X	NO	NO	NONE		URBAN
1-9-009	NO	X	NO	NO	NONE		URBAN
2-2-054	NO	X	NO	NO	NONE		URBAN
2-2-051: 054	17,596	X	25-FT.	NO	NONE	R-10 RESIDENTIAL DISTRICT	URBAN

PREPARED BY:

CIVIL ENGINEERS
 ParEn, Inc. dba Park Engineering
 711 Kapiolani Boulevard, Suite 1500
 Honolulu, Hawaii 96813

STRUCTURAL ENGINEERS
 Shigemura, Lau, Sakanashi, Higuchi
 & Associates, Inc.
 1916 Young Street, 2nd Floor
 Honolulu, Hawaii 96814

GEOTECHNICAL ENGINEERS
 Geolabs, Inc.
 2006 Kalihi Street
 Honolulu, Hawaii 96819



INDEX TO DRAWINGS

SHT. NO.	DESCRIPTION	DWG. NO.
1	TITLE SHEET	T-1
2	CONSTRUCTION NOTES	C-1
3	CONSTRUCTION NOTES	C-2
4	CONSTRUCTION NOTES	C-3
5	GENERAL PLAN	C-4
6	TEMPORARY EROSION CONTROL PLAN - 1	C-5
7	TEMPORARY EROSION CONTROL PLAN - 2	C-6
8	TEMPORARY EROSION CONTROL PLAN - 3	C-7
9	DEMOLITION PLAN -1	C-8
10	DEMOLITION PLAN -2	C-9
11	DEMOLITION PLAN -3	C-10
12	PLAN AND PROFILE - 1 (DRAIN LINE "A")	C-11
13	PLAN AND PROFILE - 2 (DRAIN LINE "A")	C-12
14	PLAN AND PROFILE - 3 (DRAIN LINE "B")	C-13
15	SITE ELEVATION PLAN	C-14
16	WATER LINE RELOCATION PLAN	C-15
17	WALL RECONSTRUCTION PLAN	C-16
18	CRM WALL PROFILES	C-17
19	CRM WALL SECTIONS	C-18
20	ENLARGED PLAN - TYPE "SPECIAL" CATCH BASIN	C-19
21	ENLARGED PLAN - DRAIN LINE B #1	C-20
22	ENLARGED PLAN - DRAIN LINE B #2	C-21
23	ENLARGED PLAN - DRAINAGE OUTLET - 1	C-22
24	ENLARGED PLAN - DRAINAGE OUTLET - 2	C-23
25	MISCELLANEOUS DETAILS	C-24
26	STRUCTURAL GENERAL NOTES AND TYPICAL DETAILS	S-1
27	TYPE "D" CATCH BASIN PLAN AND SECTIONS	S-2
28	DRAIN MANHOLE AT STA. 0+15 AND STA. 1+40	S-3
29	DRAIN MANHOLE AT STA. 1+67	S-4
30	IMPACT BASIN - STRUCTURAL PLANS AND SECTIONS	S-5
31	IMPACT BASIN - STRUCTURAL SECTIONS	S-6

APPROVED: _____ DATE _____
 DIRECTOR, DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU

Tue, 27 Jan 2015 - 9:52am
 D:\Projects\Nuuanu Pali Drive Storm Drainage Improvements\Construction Drawings\01_TITLE SHEET.dwg

NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS

FILE	POCKET	FOLDER	NO.
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GENERAL NOTES

- 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.
- 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.
- 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.
- 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, 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 CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT TWO (2) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.
- THE CONTRACTOR MAY SUBMIT A SUBSTITUTION REQUEST TO PRECAST ANY CITY OWNED AND/OR MAINTAINED DRAINAGE STRUCTURE (EX., CATCH BASINS, DRAIN MANHOLES, DRAIN INLETS, CULVERTS, ETC). HOWEVER, PRIOR TO CONSTRUCTION AND INSTALLATION OF ANY PRECAST STRUCTURE, THE CONTRACTOR SHALL A) SUBMIT SIX (6) SETS OF SHOP DRAWINGS TO THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AND OBTAIN WRITTEN APPROVAL AND B) NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES. NON-COMPLIANCE WITH ANY OF THESE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL PRECAST CONSTRUCTION WORK AND REJECTION OF ALL PRECAST STRUCTURES ALREADY CONSTRUCTED.
- 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:
 - 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:
 - FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
 - LIFELINE AND ASSOCIATED CLIPS.
 - INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
 - TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
 - EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
 - CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
 - CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20- FEET AWAY).
 - PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
 - CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
 - ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
- 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.
- FOR PROJECTS ABUTTING STATE HIGHWAYS' RIGHTS-OF WAY, THE OWNER OR HIS AUTHORIZED REPRESENTATIVE SHALL NOTIFY THE STATE DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION, OAHU DISTRICT, DRAINAGE DISCHARGE UNIT AT 831-6793 FOR AN ASSESSMENT OF STATE HIGHWAYS PERMIT REQUIREMENTS.
- FOR BENCH MARK, SEE DWGS. C-11 AND C-12.

SEWER NOTES

- ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, 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, CURRENT CITY PRACTICES, THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT, VOLUME 1, JULY 1993.
- 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.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGEMENT BRANCH, WASTEWATER DIVISION, DEPARTMENT OF DESIGN AND CONSTRUCTION, AT 768-8772 OR 768-8770 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.
- 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.
- TREES IN THE ROAD RIGHT-OF-WAY SHALL BE SITUATED A MINIMUM OF 5'-0" FROM THE CITY'S SEWER LINES.

SEWER NOTES: (CONTINUED)

- 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.
- 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 NOTIFICATION AND PRESS RELEASES.
- GEOTEXTILE FABRIC TO ENVELOPE THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.
- 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:

ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING:
 - FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
 - LIFELINE AND ASSOCIATED CLIPS.
 - INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
 - TWO-WAY RADIO (WALKIE-TALKIE) IF OUT OF LINE-OF-SITE.
 - EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
 - CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
 - CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE OF 20- FEET AWAY).
 - PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY THE INSPECTOR.
- CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
- ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
- FOR SEWER MANHOLE ADJUSTMENTS UPWARD LESS THAN 3", SEE STANDARD DETAIL S-25. FOR SMH ADJUSTMENTS UPWARD GREATER THAN 3" OR FOR ANY ADJUSTMENTS DOWNWARD, RECONSTRUCT SMH TOP FROM BELOW THE CONE SECTION.
- IF CONTRACTOR ENCOUNTERS FLOW MONITORING DEVICES SUCH AS SPECIAL SEWER MANHOLE COVER EMBEDDED WITH SOLAR PANELS, NOTIFY CITY AND COUNTY OF HONOLULU, ENV-SCM AT 768-7272 TO COORDINATE TEMPORARY REMOVAL.
- CONTRACTOR SHALL MAINTAIN VISIBILITY AND MAINTENANCE ACCESS TO LIFE SEWER MANHOLE LOCATIONS AT ALL TIMES, INCLUDING DURING NON-WORKING HOURS AND PAVING OPERATIONS.
- CONTRACTOR SHALL USE 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.

WATER NOTES

- 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 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
- 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 PAY FOR ALL DAMAGES TO EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
- 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.
- 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 THE REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PROTECT THE WATER LINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BWS APPROVAL) AND/OR MODIFY HIS CONSTRUCTION METHODS.
- RE-APPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.
- 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 DUCTLINES LARGER THAN 16") AT NO COST TO THE BOARD OF WATER SUPPLY.
- MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATERLINE SYSTEMS AND NEAREST ELECTRICAL/SIGNAL DUCTLINES PARALLELING THE WATER SYSTEM AT NO COST TO THE BOARD OF WATER SUPPLY.
- MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ELECTRICAL/CABLE/SIGNAL APPURTENANCES (INCLUDING ANY MODULAR UNITS) AND THE NEAREST WATERLINE OR WATER APPURTENANCE. CONTRACTOR SHALL FIELD VERIFY FOR ANY CONFLICTS AT EACH ELECTRICAL/CABLE/SIGNAL APPURTENANCE LOCATION. WHERE CONFLICT OCCUR, THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER TO REVISE THE ELECTRICAL/CABLE/SIGNAL APPURTENANCE TO PROVIDE THE REQUIRED CLEARANCES AT NO COST TO THE BOARD OF WATER SUPPLY.

WATER NOTES: (CONTINUED)

- THE CONTRACTOR SHALL NOTIFY BWS CAPITAL PROJECTS DIVISION, CONSTRUCTION SECTION IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
- THE CONTRACTOR SHALL VERIFY ALL EXISTING SERVICE LATERAL LOCATIONS WHETHER SHOWN OR NOT SHOWN ON PLANS PRIOR TO COMMENCING ANY OF THE WORK AND SHALL NOT ASSUME THAT WHERE NO SERVICES ARE SHOWN, NONE EXIST.
- PRIOR TO ANY EXCAVATING, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.

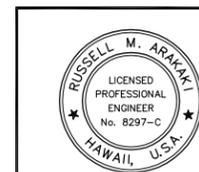
TRAFFIC NOTES FOR WORK ON CITY AND COUNTY STREETS

- 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.
- 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 HIGHWAYS ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS, PART VI TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
- WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30P.M., MONDAY THROUGHOUT FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
- 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.
- AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
- WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION IN ACCORDANCE WITH ADAAG 4.1.1(4) AND 4.3, OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
- DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
- 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 ACTIVITIES.
- 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.
- NO EQUIPMENT SHALL BE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
- THE DEPT. OF DESIGN AND CONSTRUCTION - CIVIL DIVISION, SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND THE HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE #2.

PUBLIC HEALTH SAFETY AND CONVENIENCE NOTES:

- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION SHALL BE AS DEFINED IN CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII, SUBCHAPTER 1, SECTION 16-115-2, DEFINITIONS, EFFECTIVE 09/29/94).

PgrEn, Inc.
480 PARK ENGINEERING
LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION			
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII			
CONSTRUCTION NOTES			
DESIGN: BIT	APPROVED:	DRAWING NO. C-1	
DRAWN: NGA	CHECKED: RMA	SHEET 2	
DATE: JUNE 2013	CHIEF, CIVIL DIVISION, DDC	DATE	OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW	FOLDER
			NUMBER

HECO NOTES:

- LOCATION OF HECO FACILITIES
THE LOCATION OF HECO'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 HECO'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.
- 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.
- 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.
- CAUTION!!! ELECTRICAL HAZARD!!!
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.
- OVERHEAD LINES
STATE LAW (OSHA 1910.269(k)(2b)) 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 50 KV AND BELOW. FOR EACH ADDITIONAL 10KV ABOVE 50KV, AN ADDITIONAL 4 INCHES SHALL BE ADDED TO THE 10-FOOT CLEARANCE REQUIREMENT. THE PRECEDING 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 ENCR OACH WITHIN THE MINIMUM REQUIRED CLEARANCE AT ANY TIME, THE CONTRACTOR SHALL NOTIFY HECO AT LEAST FOUR (4) WEEKS PRIOR TO THE PLANNED ENCR OACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE OR DE-ENERGIZE HECO LINES) CAN BE PUT IN PLACE. HECO MAY ALSO BE ABLE TO BLANKET ITS DISTRIBUTION (12KV AND BELOW) LINES TO PROVIDE A VISUAL AID IN PREVENTING ACCIDENTAL CONTACT. HECO'S COST OF SAFEGUARDING ITS LINES WILL BE CHARGED TO THE CONTRACTOR. CONTACT HECO'S CUSTOMER INSTALLATIONS DEPARTMENT AT 543-7846 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

REFER TO SECTION X 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.
- 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 STRAIGHTEN 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.
- 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.
- UNDERGROUND FUEL PIPELINES
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).

HECO NOTES: (CONTINUED)

- 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).
- 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 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HECO'S WORK, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, 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.
- CONFLICTS
ANY REDESIGN OR RELOCATION OF HECO'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HECO IS NOT RESPONSIBLE FOR ANY DELAY THAT MAY ARISE AS A RESULT OF ANY CONFLICTS DISCOVERED OR IDENTIFIED WITH RESPECT TO THE LOCATION OR CONSTRUCTION OF HECO'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, HECO SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.
- DAMAGE TO HECO FACILITIES
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HECO SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HECO'S FACILITIES AS A RESULT OF HIS OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES TO HECO'S TROUBLE DISPATCHER AT 548-7961. REPAIR WORK SHALL BE DONE BY HECO OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION. COSTS FOR DAMAGES TO HECO'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HECO'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HECO'S HONOLULU POWER PLANT SHIFT SUPERVISOR AT 533-2102 (A 24-HOUR NUMBER) SO HECO PERSONNEL CAN SECURE THE DAMAGED SECTION AND REPORT ANY OIL SPILLS TO THE PROPER AUTHORITIES. ALL COSTS ASSOCIATED WITH DAMAGE, REPAIR, AND OIL SPILL CLEANUP SHALL BE BORNE BY THE CONTRACTOR.
- HECO STAND-BY PERSONNEL
THE CONTRACTOR MAY REQUEST HECO TO PROVIDE AN INSPECTOR TO STAND-BY DURING CONSTRUCTION NEAR HECO'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR. THE CONTRACTOR SHALL CALL THE HECO CONSTRUCTION AND MAINTENANCE DEPARTMENT, CUSTOMER & SYSTEM SUPERINTENDENT AT 543-4223 A MINIMUM OF 5 WORKING DAYS IN ADVANCE TO ARRANGE FOR HECO STAND-BY PERSONNEL.
- CLEARANCES
THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HECO'S DUCTLINE AND ALL ADJACENT STRUCTURES (CHARTED AND UNCHARTED) IN THE TRENCH:

STRUCTURE TYPE	MINIMUM CLEARANCES (INCHES)
WATER LINES, PARALLEL	36 (A)
WATER LINES, CROSSING	12 (B)
SEWER LINES, PARALLEL	36 (C)
SEWER LINES, CROSSING	24 (D)
DRAIN LINES, PARALLEL	12
DRAIN LINES, CROSSING	6 (E)
ELECTRICAL AND GAS LINES, PARALLEL	12
ELECTRICAL AND GAS LINES, CROSSING	12
TELEPHONE LINES, PARALLEL	6 (E)
TELEPHONE LINES, CROSSING	6 (E)
CHEVRON OIL LINES, PARALLEL	36
CHEVRON OIL LINES, CROSSING	48 BELOW OIL LINE (F)

- THE MINIMUM HORIZONTAL CLEARANCES TO WATER LINES PARALLEL TO ELECTRICAL DUCTLINES SHOULD BE INCREASED TO 60 INCHES IF THE WATER LINE IS GREATER THAN OR EQUAL TO 16 INCHES IN DIAMETER.
- THE MINIMUM VERTICAL CLEARANCES TO WATER LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 6 INCHES IF THE ELECTRICAL STRUCTURE IS CONCRETE ENCASED AND IS BELOW THE WATER LINE AND THE WATERLINE IS LESS THAN 16 INCHES IN DIAMETER.
- A MINIMUM HORIZONTAL CLEARANCE OF 36 INCHES IS REQUIRED BETWEEN NEW HANDHOLES AND EXISTING SEWER LATERALS.
- THE MINIMUM VERTICAL CLEARANCES TO SEWER PIPES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 12 INCHES IF THE SEWER PIPE IS JACKETED IN CONCRETE.
- THE MINIMUM CLEARANCES SHALL BE INCREASED TO 12 INCHES IF THE ELECTRICAL DUCTLINE IS DIRECT BURIED.
- THE MINIMUM VERTICAL CLEARANCES TO OIL LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 24 INCHES BELOW OIL LINES IF THE CROSSINGS ARE ENCASED IN 6 INCHES OF CONCRETE.

HECO NOTES: (CONTINUED)

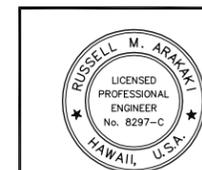
- CLEARANCES (CONTINUED)
THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER & HECO OF ANY HEAT SOURCES (POWER CABLE DUCT BANK, STEAMLINE, ETC.) ENCOUNTERED THAT ARE NOT PROPERLY IDENTIFIED ON THE DRAWING.

THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HECO'S FUEL OIL PIPELINES AND ALL ADJACENT STRUCTURES: 24-INCHES, PARALLEL OR CROSSING. THE MINIMUM CLEARANCE CAN BE REDUCED TO 12 INCHES (PARALLEL AND BELOW ONLY) IF THE STRUCTURE IS JACKETED IN CONCRETE.
- INDEMNITY
THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HECO 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 HECO.

GAS NOTES

- 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.
- WRITTEN CLEARANCES MUST BE OBTAINED FROM THE GAS COMPANY AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING EXCAVATION NEAR THESE GAS PIPELINES.
- 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.
- THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPELINES IN THE PRESENCE OF THE GAS COMPANY. ALL BACKFILL WITHIN SIX INCHES OF ANY GAS PIPELINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY THE GAS COMPANY.
- 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.
- 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 535-5933, 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 THIS WORK TO BE BORNE BY THE CONTRACTOR.
- 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 THE GAS COMPANY.
- 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.

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



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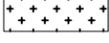
PgrEn, Inc.
480 PARK ENGINEERING
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DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION			
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII			
CONSTRUCTION NOTES			
DESIGN: BIT	APPROVED:	DRAWING NO. C-2	
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 3	
CHECKED: RMA		OF 31 SHEETS	
DATE: JUNE 2013	DATE	JOB NO. 33-13	
FILE		DRAW FOLDER NUMBER	

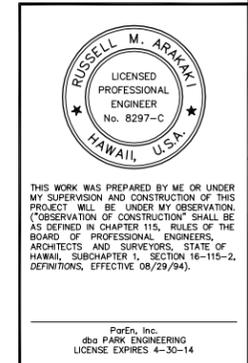
HAWAIIAN TELCOM GENERAL CONSTRUCTION/DESIGN NOTES

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 TONING REQUEST FROM HAWAIIAN TELCOM'S EXCAVATION PERMIT SECTION, LOCATED AT 3239 UALENA STREET, THIRD FLOOR, 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 3:00 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 840-1444 (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 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 CONTAIN 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 UNDERGROUND TELEPHONE SYSTEMS" DATED MARCH 1999. ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, 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 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 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 PUBLIC WORKS, 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 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 NOTES
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 THEN 12" LONG AND HAVING A DIAMETER OF 1/4" 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 TELCOM 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.

LEGEND:

-  TOP CURB SPOT ELEVATION
-  BOTTOM CURB SPOT ELEVATION
-  FINISH GROUND ELEVATION
- E300^{3ø} FINISH GRADE TO MATCH EXISTING GRADE
- F300^{øø} FINISH GRADE
-  EXIST. WATER LINE
-  EXIST. DRAIN LINE
-  EXIST. OVERHEAD UTILITY LINE
-  EXIST. GAS LINE
- CRM CONCRETE RUBBLE MASONRY WALL
- A.C. ASPHALT CONCRETE
- DMH DRAIN MANHOLE
- RCP REINFORCED CONCRETE PIPE
- HDPE HIGH DENSITY POLYETHYLENE
- A.C. ASPHALT CONCRETE
- A.C. ASPHALT CONCRETE
-  EXIST. CONTOUR
-  DIRECTION OF FLOW
-  NEW LANDSCAPING
-  NEW A.C. PAVEMENT (CITY R.O.W.)
-  CONSTRUCTION INGRESS/EGRESS
-  A.C. PAVEMENT TO BE DEMOLISHED

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

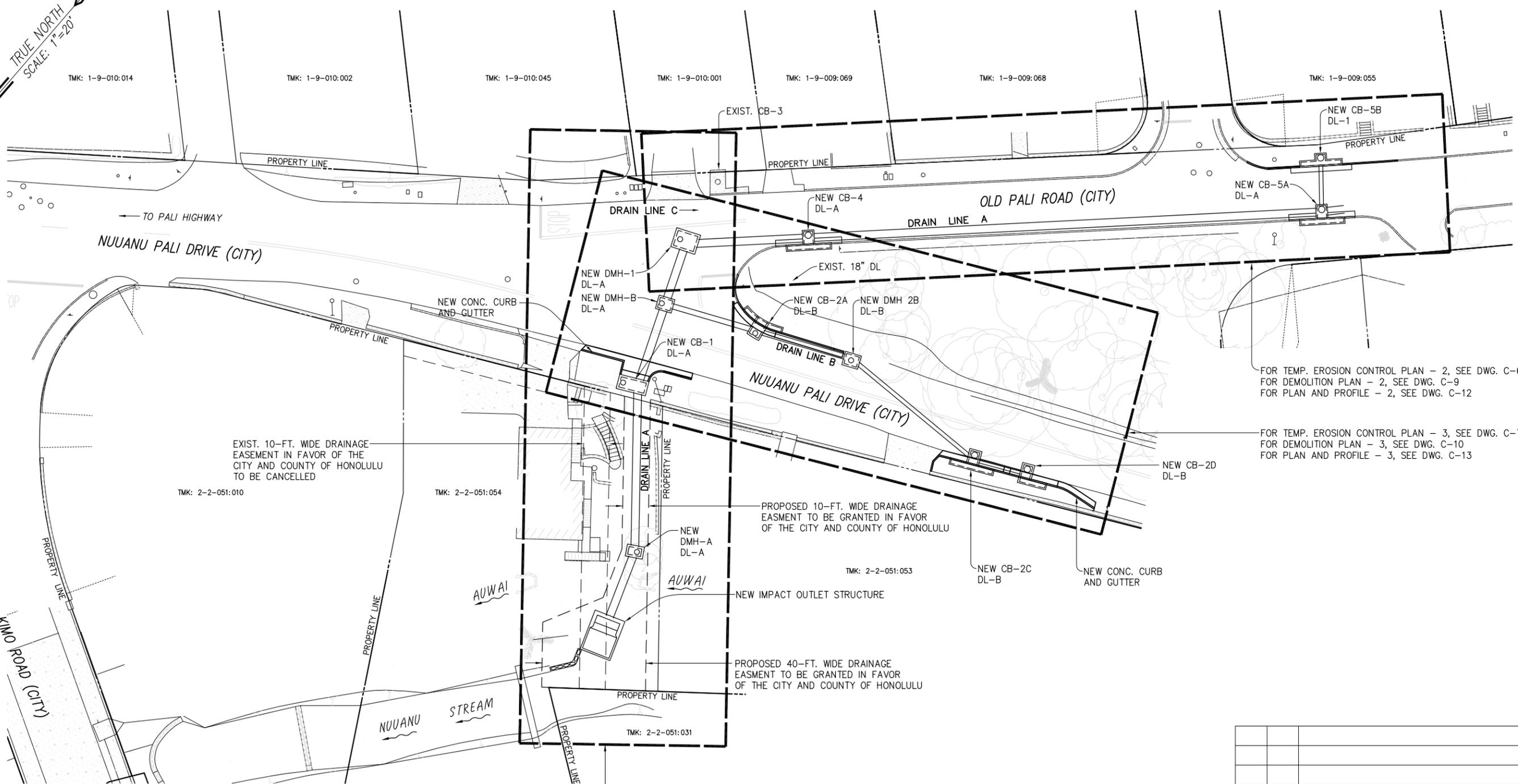
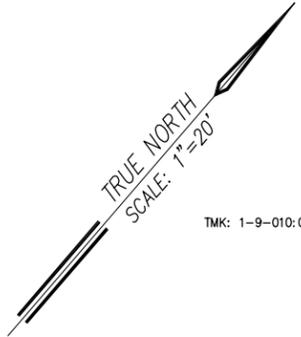
**NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS**
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

CONSTRUCTION NOTES

DESIGN: BIT	APPROVED:	DRAWING NO. C-3
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 4
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER

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PgrEn, Inc.
460 PARK ENGINEERING
LICENSE EXPIRES 4-30-14



FOR TEMP. EROSION CONTROL PLAN - 2, SEE DWG. C-6
 FOR DEMOLITION PLAN - 2, SEE DWG. C-9
 FOR PLAN AND PROFILE - 2, SEE DWG. C-12

FOR TEMP. EROSION CONTROL PLAN - 3, SEE DWG. C-7
 FOR DEMOLITION PLAN - 3, SEE DWG. C-10
 FOR PLAN AND PROFILE - 3, SEE DWG. C-13

EXIST. 10-FT. WIDE DRAINAGE EASEMENT IN FAVOR OF THE CITY AND COUNTY OF HONOLULU TO BE CANCELLED

PROPOSED 10-FT. WIDE DRAINAGE EASEMENT TO BE GRANTED IN FAVOR OF THE CITY AND COUNTY OF HONOLULU

PROPOSED 40-FT. WIDE DRAINAGE EASEMENT TO BE GRANTED IN FAVOR OF THE CITY AND COUNTY OF HONOLULU

FOR TEMP. EROSION CONTROL PLAN - 1, SEE DWG. C-5
 FOR DEMOLITION PLAN - 1, SEE DWG. C-8
 FOR PLAN AND PROFILE - 1, SEE DWG. C-11

GENERAL PLAN
 SCALE: 1" = 20'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



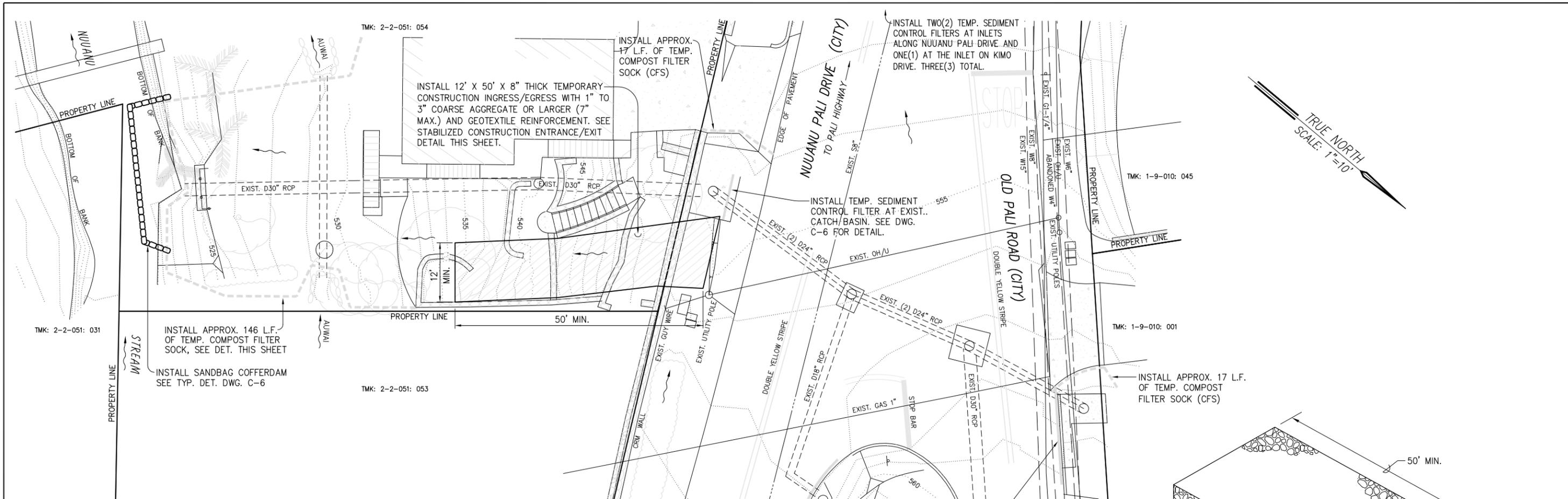
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DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
 TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
 NUUANU, HONOLULU, OAHU, HAWAII

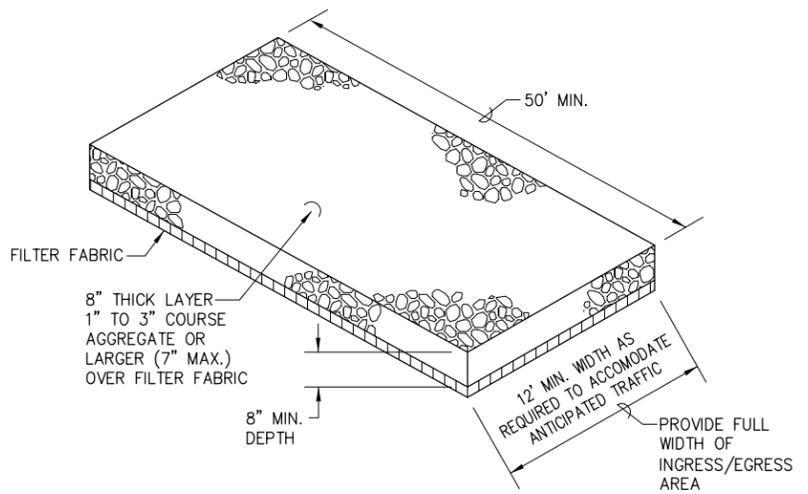
GENERAL PLAN

DESIGN: BIT	APPROVED:	DRAWING NO. C-4
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 5
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER

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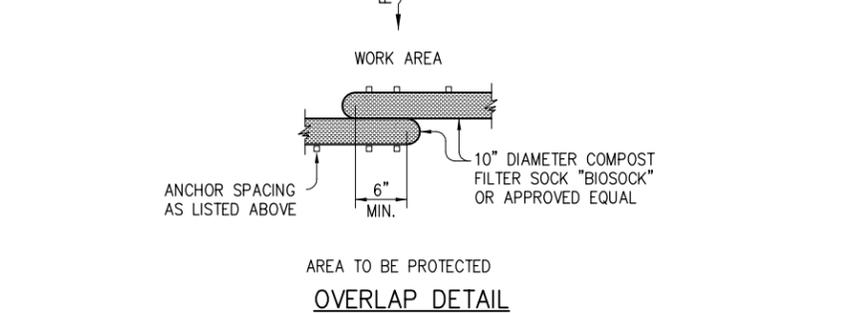
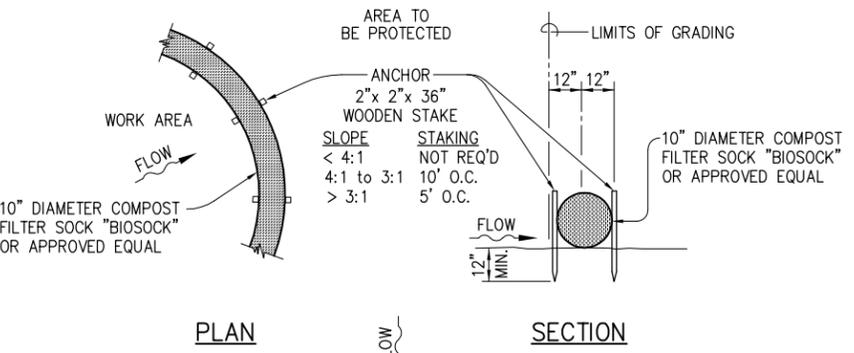
EROSION CONTROL PLAN - 1
SCALE: 1" = 10'



STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL
NOT TO SCALE

TEMPORARY WATER POLLUTION, EROSION AND DUST CONTROL MEASURES

1. INSTALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN. MEASURES INSTALLED PER THIS DRAWING SHALL BE MAINTAINED UNTIL GROUND COVER IS ESTABLISHED.
2. INSTALL TEMPORARY COMPOST FILTER SOCK. (SEE DETAIL, THIS SHEET)
3. MOISTEN EXPOSED DIRT AREAS TO PREVENT DUST POLLUTION AND NUISANCE.
4. GRASS/MULCH ALL EXPOSED SLOPES FOR DUST AND EROSION CONTROL. GRASS/MULCH AREAS DISTURBED BY CONSTRUCTION ACTIVITIES AND NO LONGER OCCUPIED BY THE CONTRACTOR.
5. MAINTAIN EROSION CONTROL MEASURES DURING DEMOLITION AND WALL CONSTRUCTION. MONITOR AND MAINTAIN SILT FENCE DURING TIMES OF ABOVE NORMAL RAINFALL EVENTS AND PERIODICALLY.
6. THE ADJACENT ROADWAYS SHALL BE CLEANED ON A DAILY BASIS TO BE FREE FROM DEBRIS AND SEDIMENT RESULTING FROM THE CONSTRUCTION WORK. THE CLEANING OF ADJACENT ROADWAYS SHALL BE CONSIDERED INCIDENTAL TO TEMPORARY EROSION AND DUST CONTROL MEASURES.
7. INSTALL TEMPORARY SEDIMENT CONTROL FILTERS AT CATCH BASINS ALONG NUUANU PALI DRIVE AND OLD PALI ROAD, INCLUDING AREAS IMMEDIATELY DOWN THE STREET FROM THE PROJECT LOCATION. SEE DETAIL, SHEET C-6.
8. FLUSHING INTO THE EXISTING INLET IS PROHIBITED.
9. ADJUST BMP'S AND PROVIDE ADDITIONAL MEASURES AS CONSTRUCTION PROGRESSES. ADDITIONAL MEASURES SHALL BE CONSIDERED INCIDENTAL TO TEMPORARY EROSION AND DUST CONTROL MEASURES.
10. INSTALL CRUSHED ROCK BASE FOR STABILIZED CONSTRUCTION INGRESS AND EGRESS (8" THICK, 1" TO 3" COARSE AGGREGATE OR LARGER (7" MAX.) WITH GEOTEXTILE REINFORCEMENT. SEE DETAIL, THIS SHEET.



NOTE:
COMPOST SHALL NOT CONTAIN BIOSOLIDS AND SHOULD BE CONSISTENT WITH EPA GUIDELINES.

COMPOST FILTER SOCK DETAIL
NOT TO SCALE

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

RUSSELL M. ARAKAWI
LICENSED PROFESSIONAL ENGINEER
No. 8297-C
HAWAII, U.S.A.

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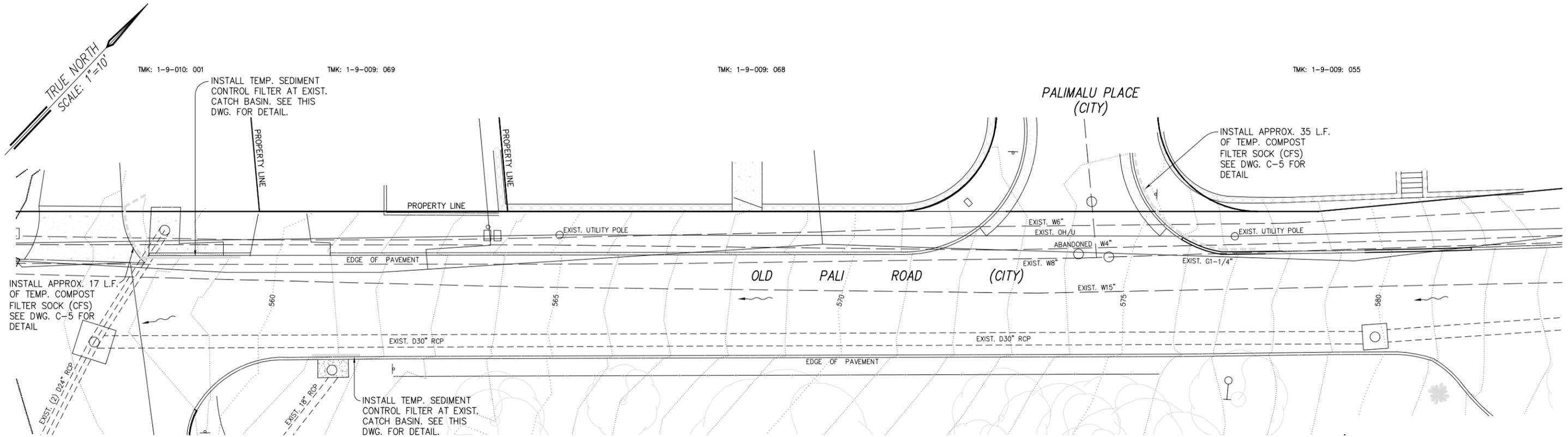
PgrEn, Inc.
dba PARK ENGINEERING
LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

**NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS**
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

EROSION CONTROL PLAN - 1

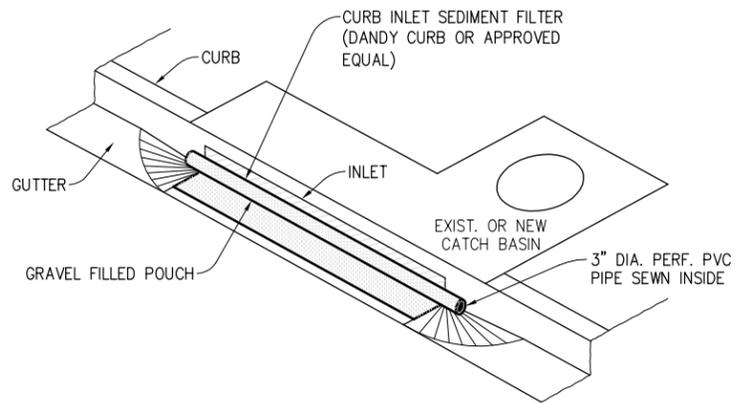
DESIGN: BIT	APPROVED:	DRAWING NO. C-5
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 6
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER



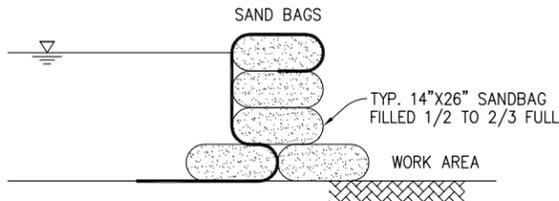
EROSION CONTROL PLAN - 2
SCALE: 1" = 10'

NOTES:

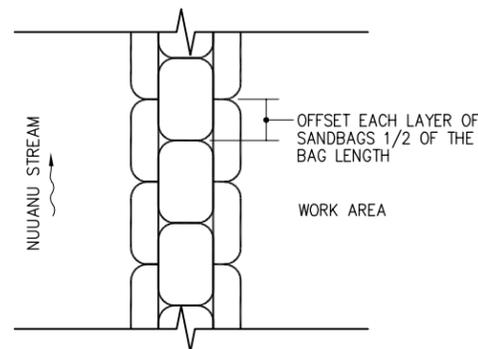
1. SEDIMENT CONTROL FILTERS SHALL BE INSTALLED AND MAINTAINED AT ALL EXISTING CATCH BASINS ALONG NUUANU PALI DRIVE AND OLD PALI ROAD ADJACENT TO PROJECT SITE AND NEW CATCH BASINS WITHIN PROJECT.
2. THE CONTRACTOR SHALL REMOVE FILTERS AT TIMES OF ABOVE NORMAL RAINFALL EVENTS AND REPLACE THEM WHEN EVENT PASSES.



SEDIMENT CONTROL FILTER DETAIL
NOT TO SCALE



SAND BAG COFFERDAM DETAIL
NOT TO SCALE



SAND BAG COFFERDAM PLAN VIEW
NOT TO SCALE

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

RUSSELL M. ARAKAKI
 LICENSED PROFESSIONAL ENGINEER
 No. 8297-C
 HAWAII, U.S.A.

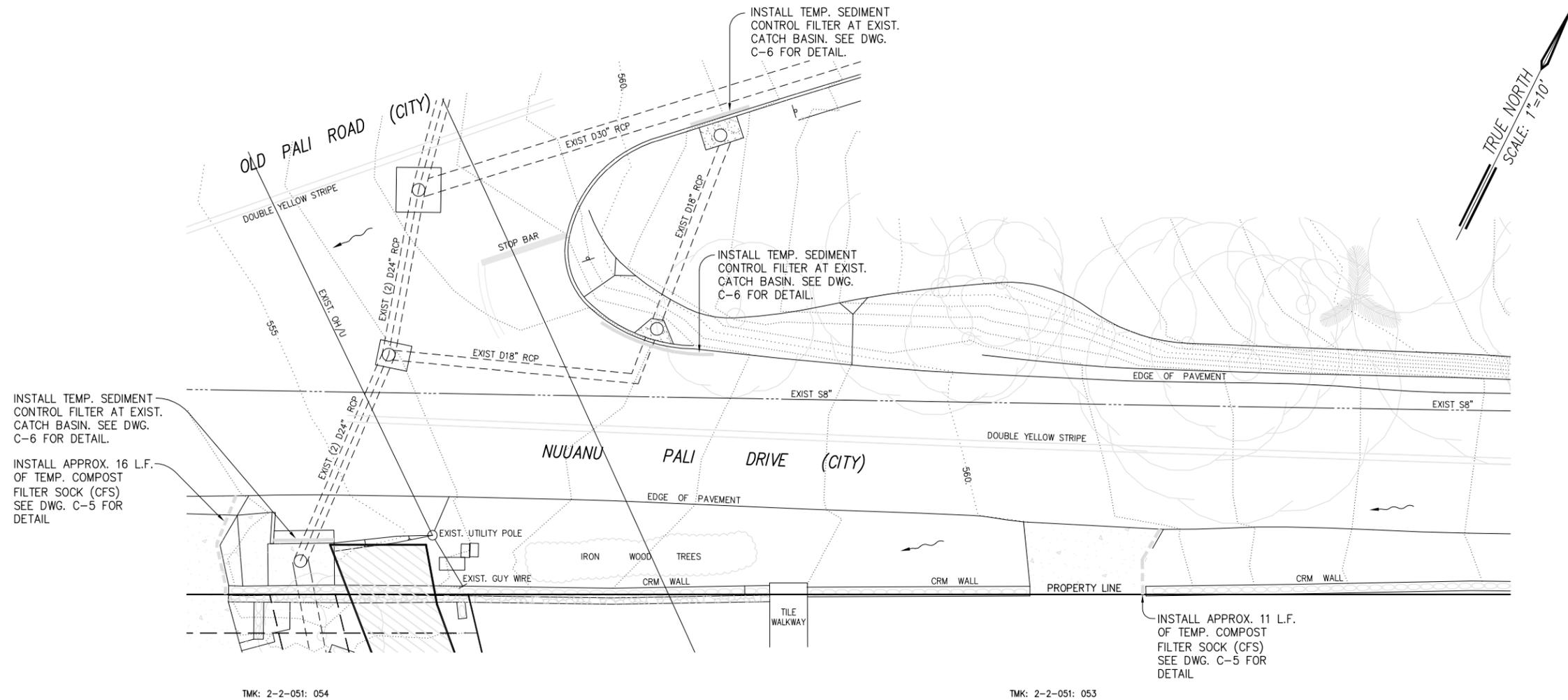
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PgrEn, Inc.
 dba PARK ENGINEERING
 LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
 NUUANU PALI DRIVE AND OLD PALI ROAD
 STORM DRAINAGE IMPROVEMENTS
 TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
 NUUANU, HONOLULU, OAHU, HAWAII

EROSION CONTROL PLAN - 2

DESIGN: BIT	APPROVED:	DRAWING NO. C-6
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 7
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER



EROSION CONTROL PLAN - 3
SCALE: 1" = 10'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

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PgrEn, Inc.
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LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

**NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS**
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

EROSION CONTROL PLAN - 3

DRAWING NO.
C-7

SHEET **8**
OF 31 SHEETS

DESIGN: BIT	APPROVED:	DATE: JUNE 2013
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	DATE
CHECKED: RMA	FILE	DRAW
JOB NO. 33-13	FOLDER	NUMBER

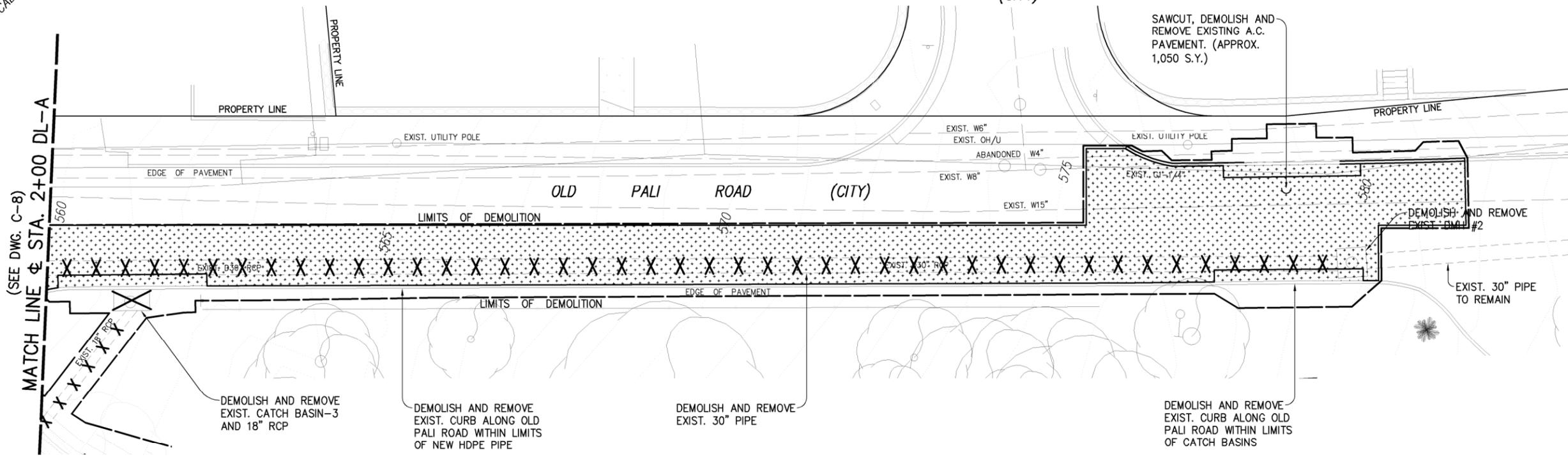
TRUE NORTH
SCALE: 1"=10'

TMK: 1-9-009: 069

TMK: 1-9-009: 068

PALIMALU PLACE
(CITY)

TMK: 1-9-009: 055



DEMOLITION PLAN - 2
SCALE: 1"= 10'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

RUSSELL M. ARAKI
LICENSED PROFESSIONAL ENGINEER
No. 8297-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4-30-14

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CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

**NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS**
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

DEMOLITION PLAN - 2

DESIGN: BIT	APPROVED:	DRAWING NO.
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	C-9
CHECKED: RMA		SHEET 10
DATE: JUNE 2013	DATE	OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER

EXIST. (2) 24" PIPES TO REMAIN. REMOVE PORTIONS AS REQUIRED FOR CONSTRUCTION OF NEW DRAIN MANHOLE

DEMOLISH AND REMOVE EXIST. DRAIN MAN HOLE

DEMOLISH AND REMOVE EXIST. DRAIN MAN HOLE

DEMOLISH AND REMOVE 18" PIPE

DEMOLISH AND REMOVE (2) 24" PIPES

DEMOLISH AND REMOVE EXIST. CATCH BASIN CONC. CURB AND GUTTER

CUT AND PLUG

PROPERTY LINE

TMK: 2-2-051: 054

ABANDON EXIST. 30" PIPE (70 LF±) AND DRAIN MANHOLE IN PLACE FILL PIPE AND DRAIN MANHOLE WITH C&C CLASS "B" CONCRETE

DEMOLISH AND REMOVE EXIST. CRM WALL. SALVAGE EXIST. ROCK FOR RECONSTRUCTION FOR WALL.

DEMOLISH AND REMOVE EXIST. TREE

TMK: 2-2-051: 053

SAWCUT, DEMOLISH AND REMOVE EXISTING A.C. PAVEMENT. (APPROX. 1,050 S.Y.)

DEMOLITION PLAN - 3

SCALE: 1" = 10'



REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

**NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS**
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

DEMOLITION PLAN - 3

DESIGN: BIT

DRAWN: NGA

CHECKED: RMA

DATE: JUNE 2013

APPROVED: _____

CHEF, CIVIL DIVISION, DDC

DRAWING NO.
C-10

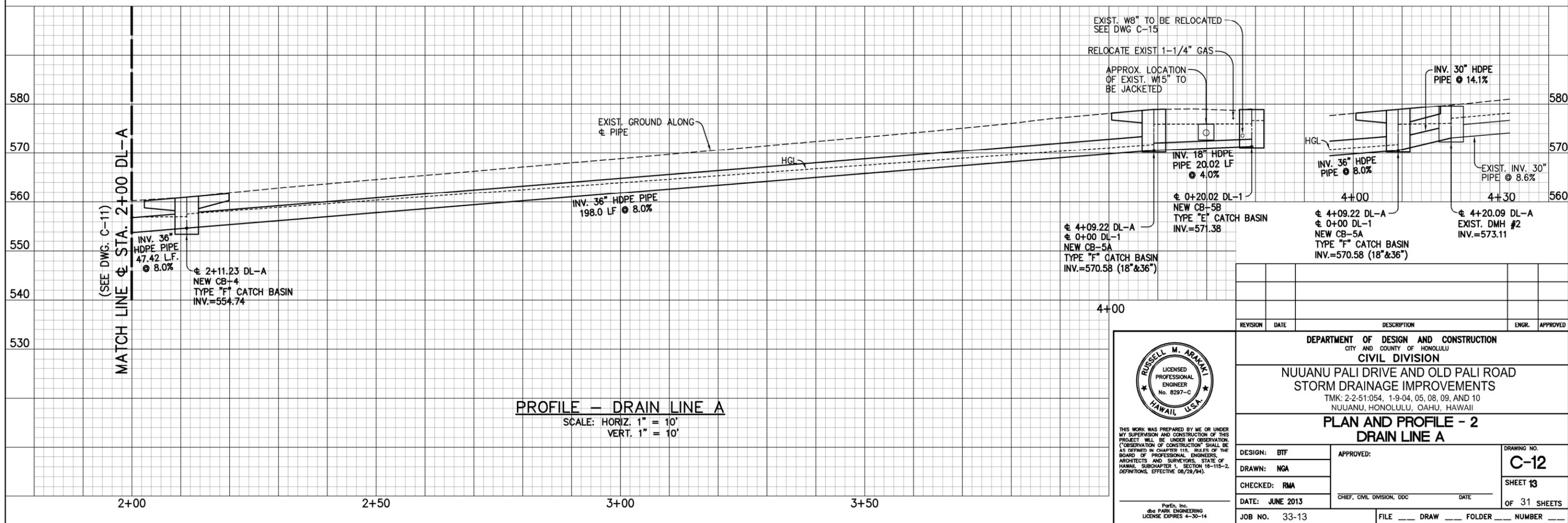
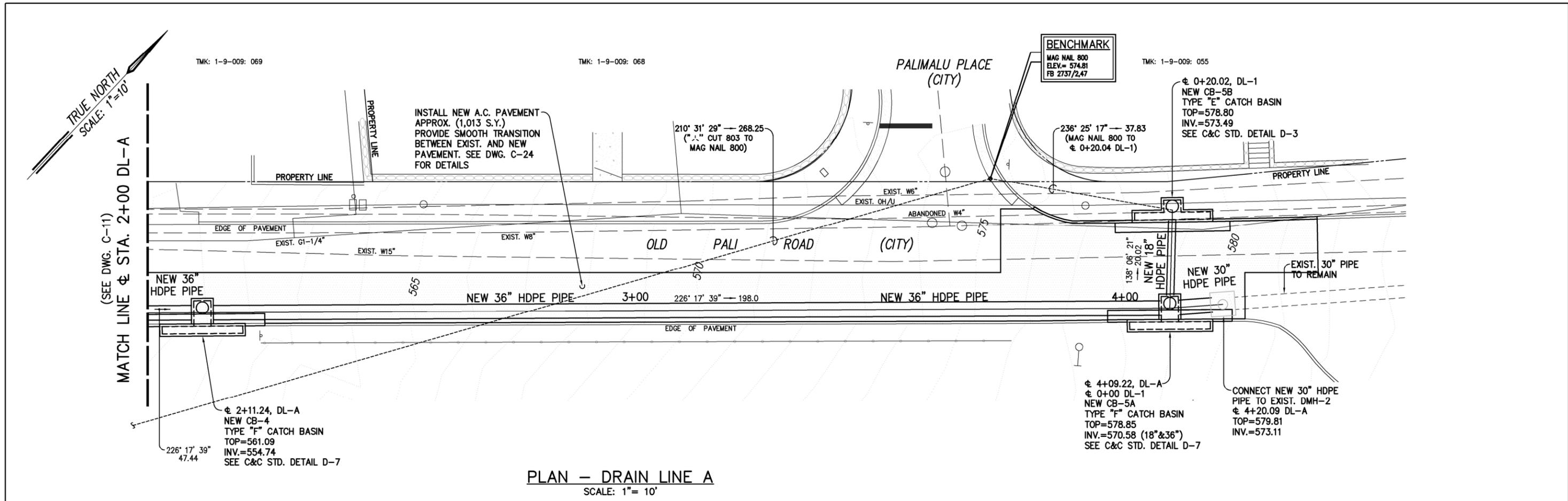
SHEET **11**
OF 31 SHEETS

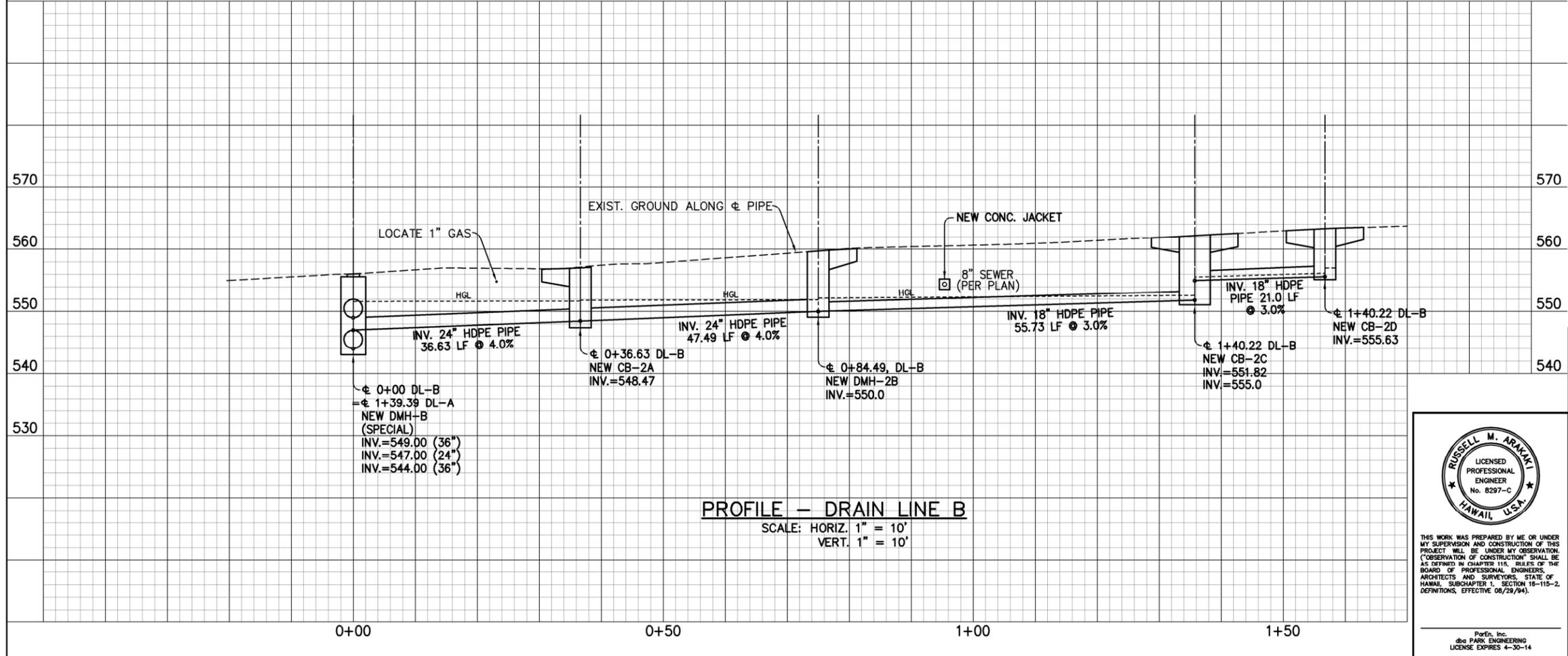
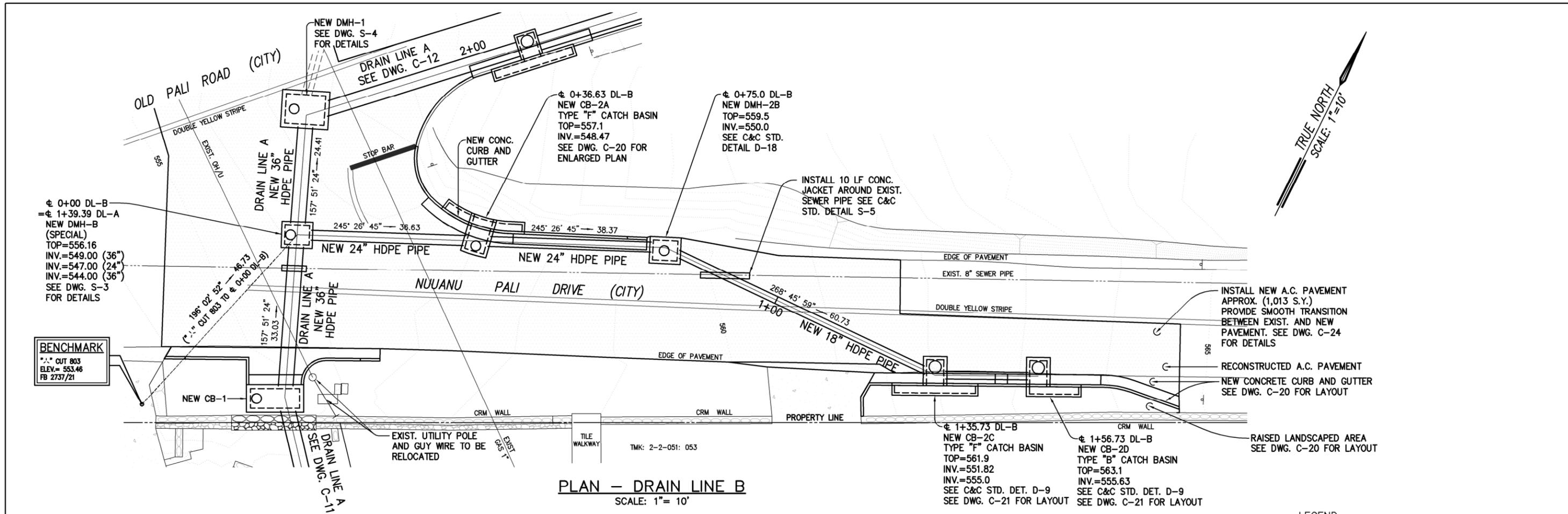
FILE ___ DRAW ___ FOLDER ___ NUMBER ___



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LICENSE EXPIRES 4-30-14





LEGEND:
 - 545 - APPROX. CONTOUR ELEVATIONS
 - [Symbol] - NEW A.C. PAVEMENT (CITY R.O.W.)

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

RUSSELL M. ARAKAKI
 LICENSED PROFESSIONAL ENGINEER
 No. 8297-C
 HAWAII, U.S.A.

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PgrEn, Inc.
 400 PARK ENGINEERING
 LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
 CIVIL DIVISION

NUUANU PALI DRIVE AND OLD PALI ROAD
 STORM DRAINAGE IMPROVEMENTS
 TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
 NUUANU, HONOLULU, OAHU, HAWAII

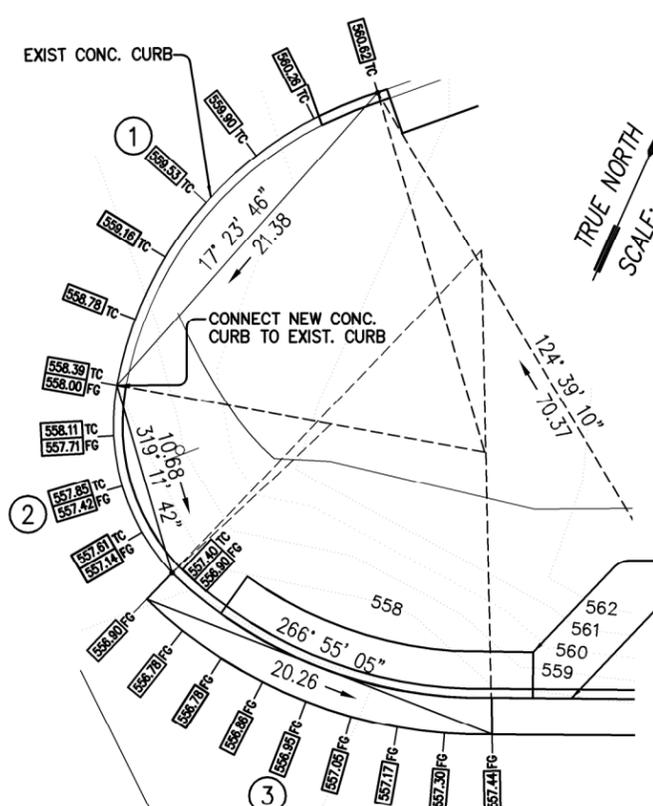
**PLAN AND PROFILE - 3
 DRAIN LINE B**

DESIGN: BIT	APPROVED:	DRAWING NO. C-13
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	SHEET 14
CHECKED: RMA	DATE	OF 31 SHEETS
DATE: JUNE 2013	FILE	DRAW
JOB NO. 33-13	DRAW	FOLDER
	NUMBER	

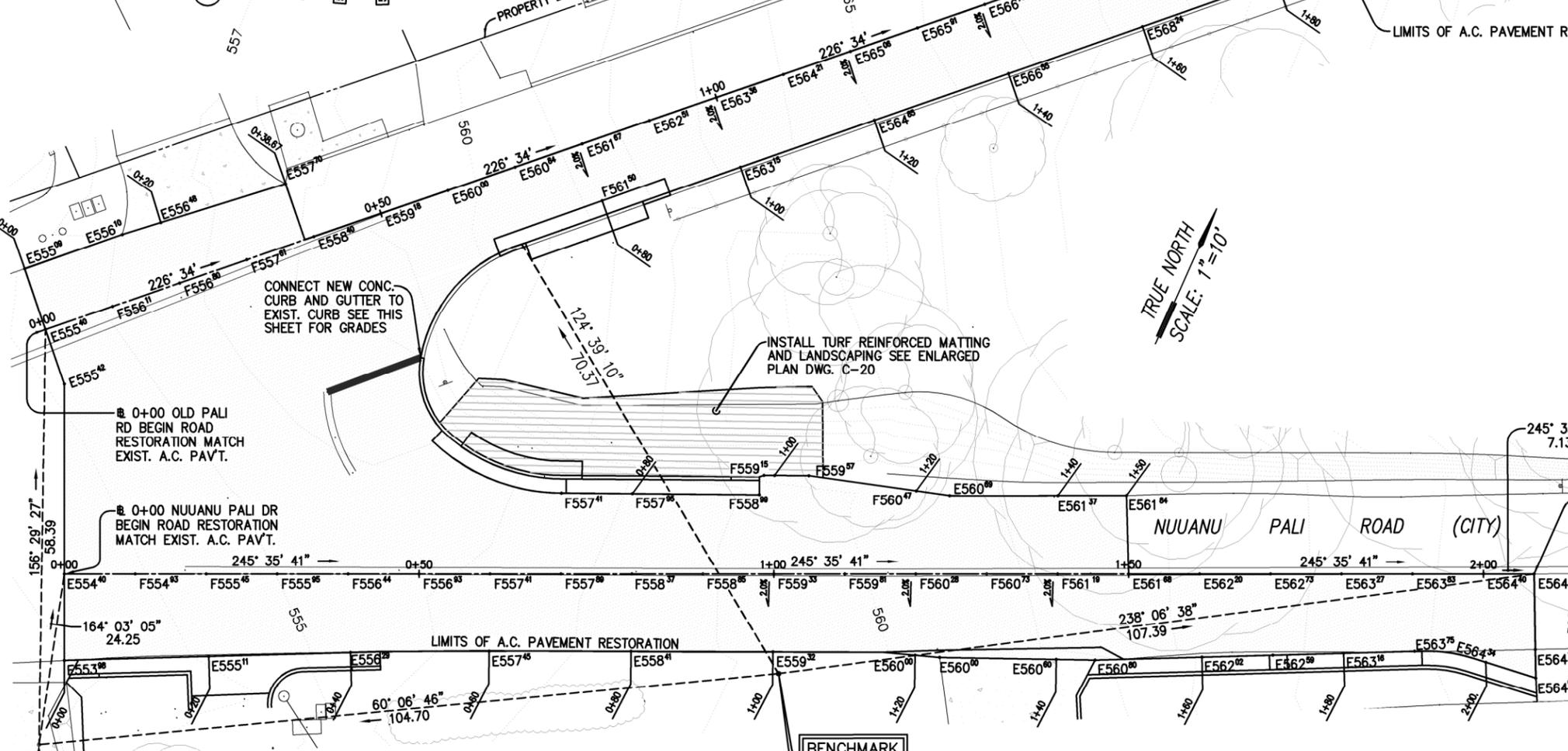
CURVE DATA

	①	②	③
Δ	63° 5' 35.93"	53° 20' 20.81"	45° 8' 4.20"
Δ/2	31° 32' 47.97"	26° 40' 10.4"	22° 34' 2.10"
R	20.44	11.90	26.40
T	12.55	5.98	10.97
C	21.38	10.68	20.26
Lc	22.5	11.07	20.80

CURB GRADES
SCALE: 1" = 5'



NEW CATCH BASIN TYPE "F"
NEW CONC. CURB AND GUTTER



SITE ELEVATION PLAN
SCALE: 1" = 10'

LEGEND:

- E[563.58] FG NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
- [563.56] FG NEW FINISH SPOT GRADE
- [564.06] TC NEW TOP OF CURB ELEV.
- [563.56] BC NEW BOTTOM OF CURB ELEV.
- [561.99] GT NEW GUTTER ELEV.
- F300⁰⁸ FINISH GRADE
- E300³⁸ FINISH GRADE TO MATCH EXISTING GRADE
- [Hatched Box] TURF REINFORCEMENT MATTING AND LANDSCAPING
- 2.0% ROAD CROSS SLOPE

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

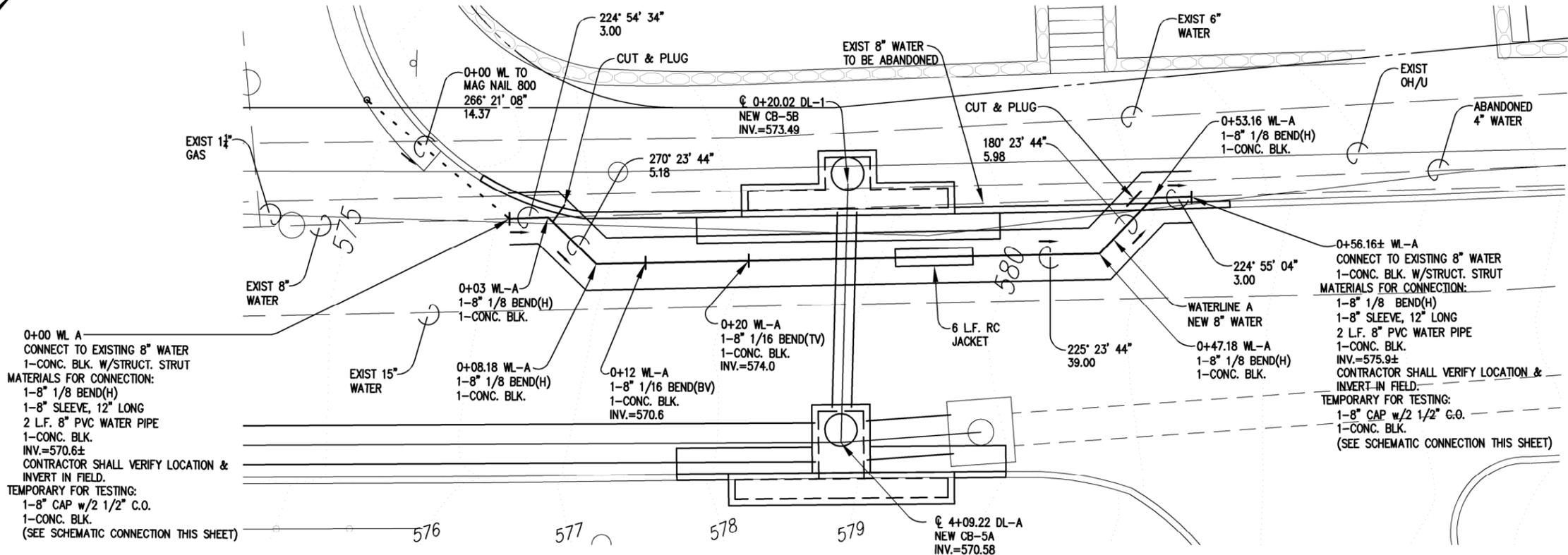


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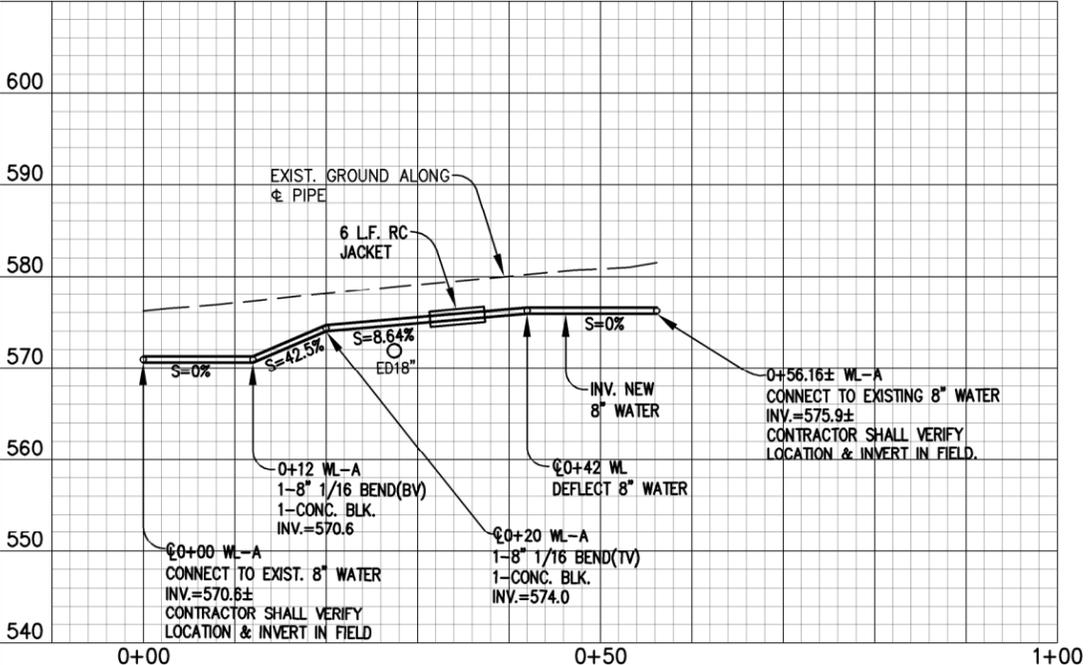
PgrEn, Inc.
480 PARK ENGINEERING
LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII			
SITE ELEVATION PLAN			
DESIGN: BIT	APPROVED:	DRAWING NO. C-14	
DRAWN: NGA	CHECKED: RMA	SHEET 15	
DATE: JUNE 2013	DATE:	OF 31 SHEETS	
JOB NO. 33-13	FILE	DRAW	FOLDER
			NUMBER

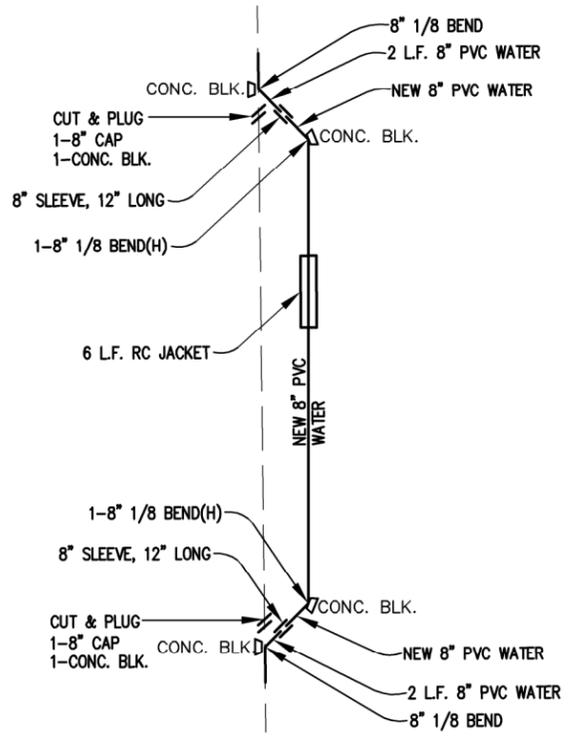
"X" CUT 803
ELEV=553.46
FB 2737/21



PLAN - WATERLINE A
SCALE: 1" = 10'



PROFILE - WATERLINE A
SCALE: HORIZ. 1" = 10'
VERT. 1" = 10'



SCHEMATIC CONNECTION
@ 0+00 AND 0+56.16 WL-A
NOT TO SCALE

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



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480 PARK ENGINEERING
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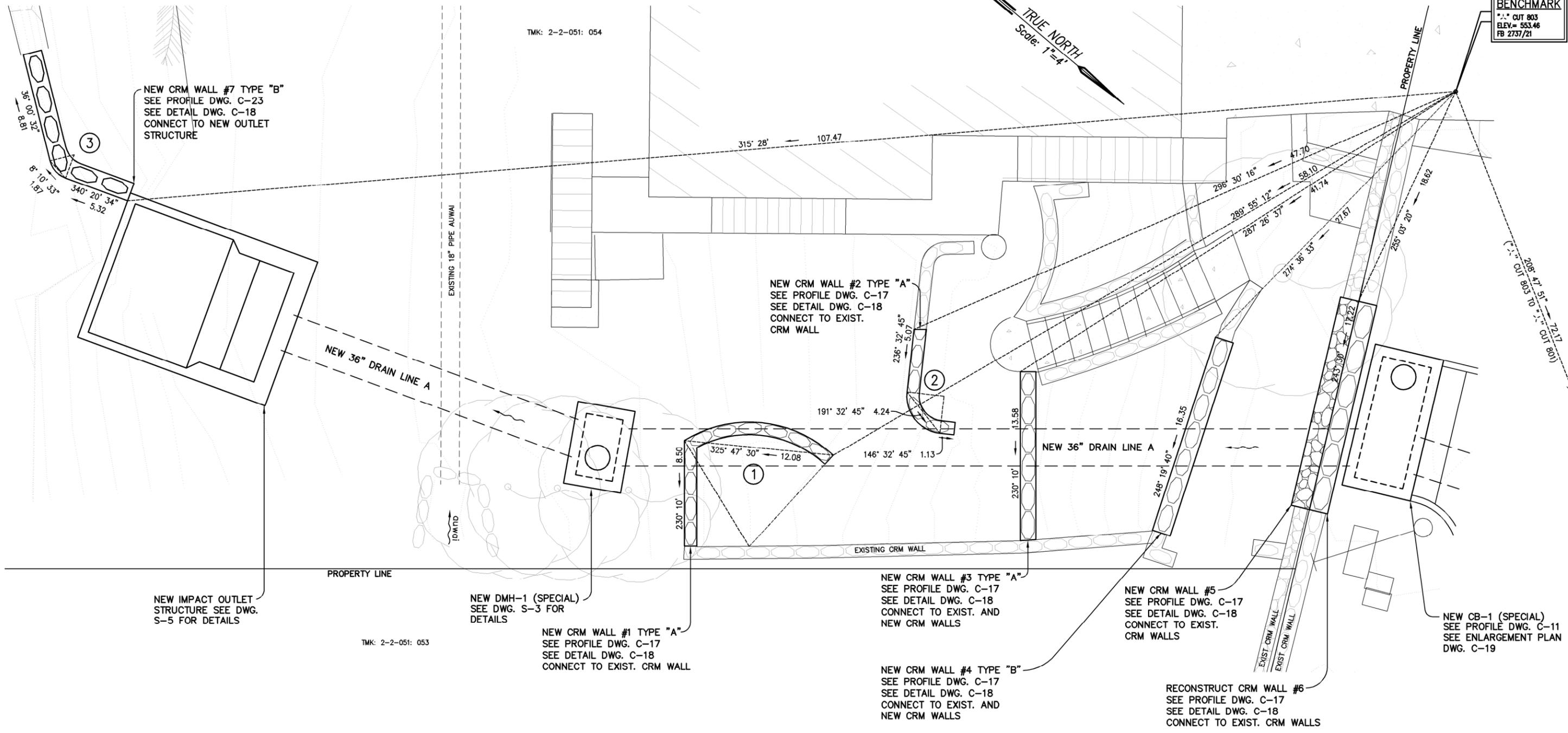
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

DESIGN: BIT		APPROVED:		DRAWING NO. C-15
DRAWN: NGA				SHEET 16
CHECKED: RMA				OF 31 SHEETS
DATE: JUNE 2013				
JOB NO. 33-13		FILE DRAW FOLDER NUMBER		

BENCHMARK
 CUT 803
 ELEV.= 553.46
 FB 2737/21

TRUE NORTH
 Scale: 1"=4'

TMK: 2-2-051: 054



NEW CRM WALL #7 TYPE "B"
 SEE PROFILE DWG. C-23
 SEE DETAIL DWG. C-18
 CONNECT TO NEW OUTLET
 STRUCTURE

NEW CRM WALL #2 TYPE "A"
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST.
 CRM WALL

NEW DMH-1 (SPECIAL)
 SEE DWG. S-3 FOR
 DETAILS

NEW CRM WALL #1 TYPE "A"
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST. CRM WALL

NEW CRM WALL #3 TYPE "A"
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST. AND
 NEW CRM WALLS

NEW CRM WALL #4 TYPE "B"
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST. AND
 NEW CRM WALLS

NEW CRM WALL #5
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST.
 CRM WALLS

RECONSTRUCT CRM WALL #6
 SEE PROFILE DWG. C-17
 SEE DETAIL DWG. C-18
 CONNECT TO EXIST. CRM WALLS

NEW CB-1 (SPECIAL)
 SEE PROFILE DWG. C-11
 SEE ENLARGEMENT PLAN
 DWG. C-19

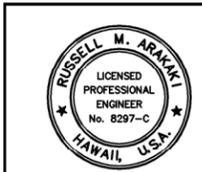
CURVE DATA

	①	②	③
Δ	74' 18" 24"	90' 00'	55' 39' 58"
Δ/2	37' 9" 12"	45' 00'	27' 49' 59"
R	10.00	3.00	2.00
T	7.58	3.00	1.06
C	12.08	4.25	1.87
Lc	12.97	4.73	1.94

WALL RECONSTRUCTION PLAN

SCALE: 1"= 4'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



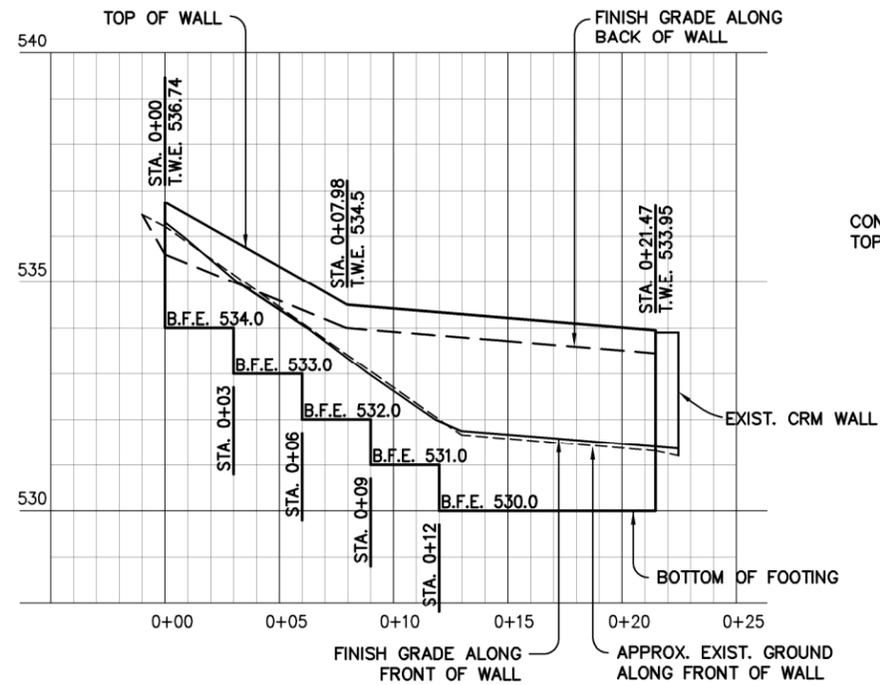
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. ("OBSERVATION OF CONSTRUCTION" SHALL BE AS DEFINED IN CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII, SUBCHAPTER 1, SECTION 16-115-2, DEFINITIONS, EFFECTIVE 09/29/94).

PgrEn, Inc.
 dba PARK ENGINEERING
 LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
 NUUANU PALI DRIVE AND OLD PALI ROAD
 STORM DRAINAGE IMPROVEMENTS
 TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
 NUUANU, HONOLULU, OAHU, HAWAII

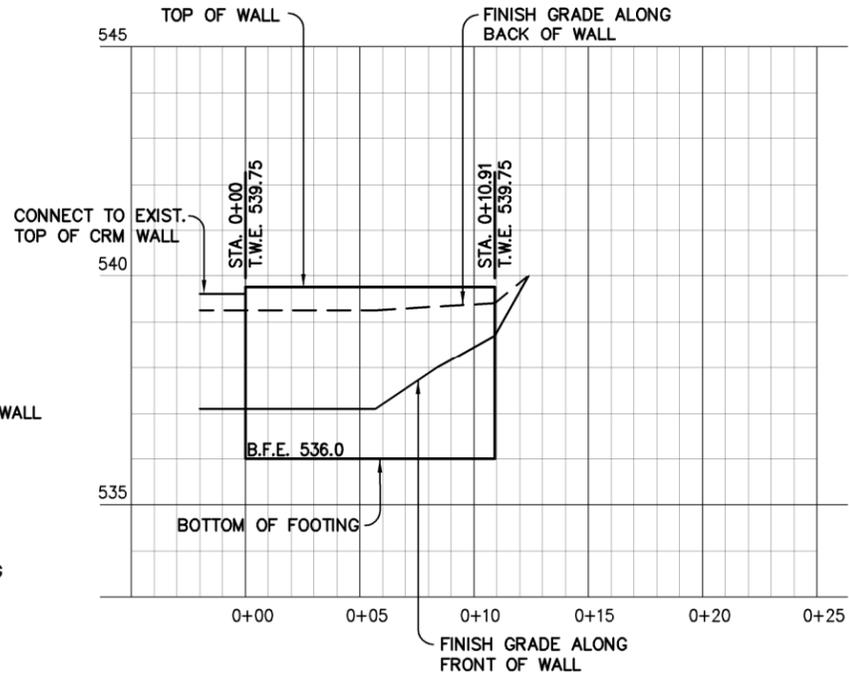
WALL RECONSTRUCTION PLAN

DESIGN: BIT	APPROVED:	DRAWING NO. C-16
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	SHEET 17
CHECKED: RMA	DATE	OF 31 SHEETS
DATE: JUNE 2013	FILE	DRAW
JOB NO. 33-13	DRAW	FOLDER
	NUMBER	



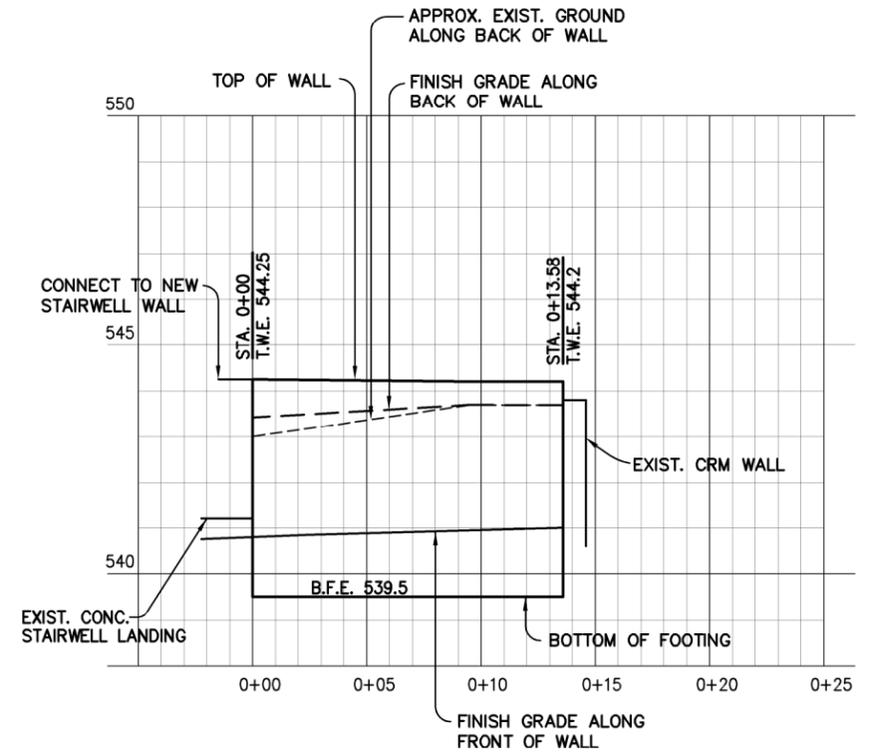
TYPE A
PROFILE - WALL NO. 1

SCALE: HORIZ. 1" = 4'
VERT. 1" = 2'



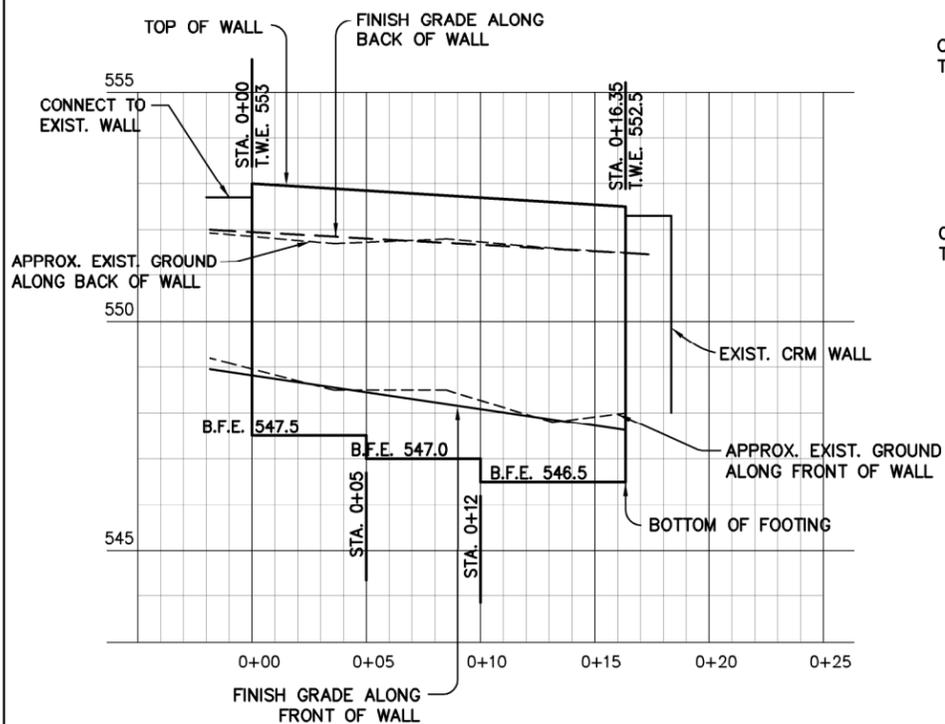
TYPE A
PROFILE - WALL NO. 2

SCALE: HORIZ. 1" = 4'
VERT. 1" = 2'



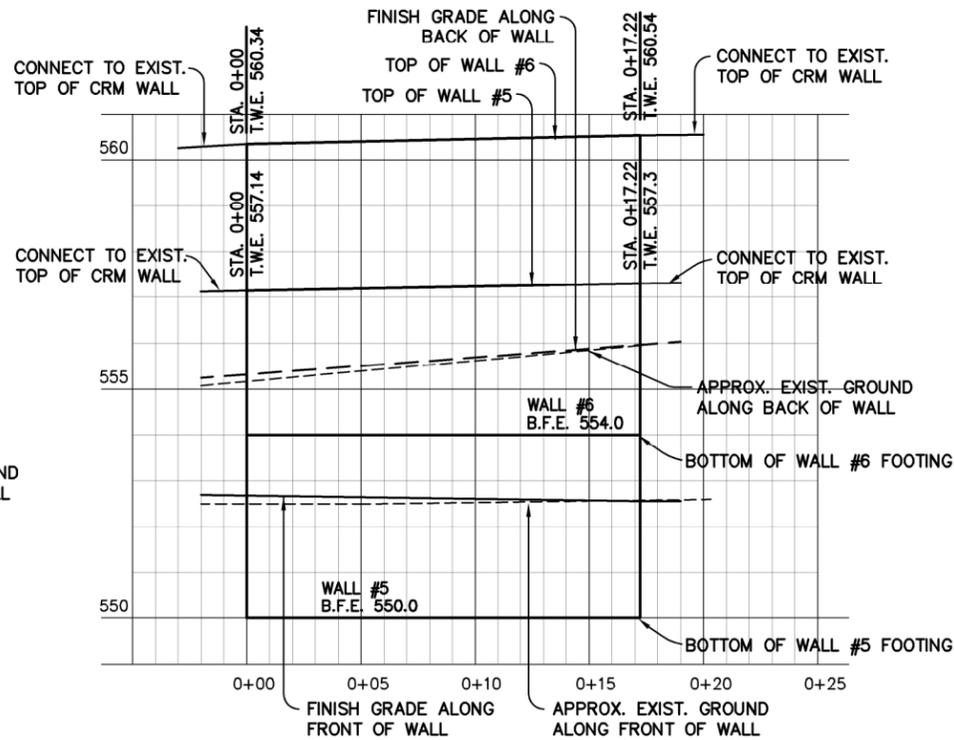
TYPE A
PROFILE - WALL NO. 3

SCALE: HORIZ. 1" = 4'
VERT. 1" = 2'



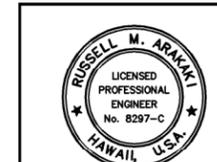
TYPE B
PROFILE - WALL NO. 4

SCALE: HORIZ. 1" = 4'
VERT. 1" = 2'



PROFILE - WALL NO. 5 AND 6

SCALE: HORIZ. 1" = 4'
VERT. 1" = 2'



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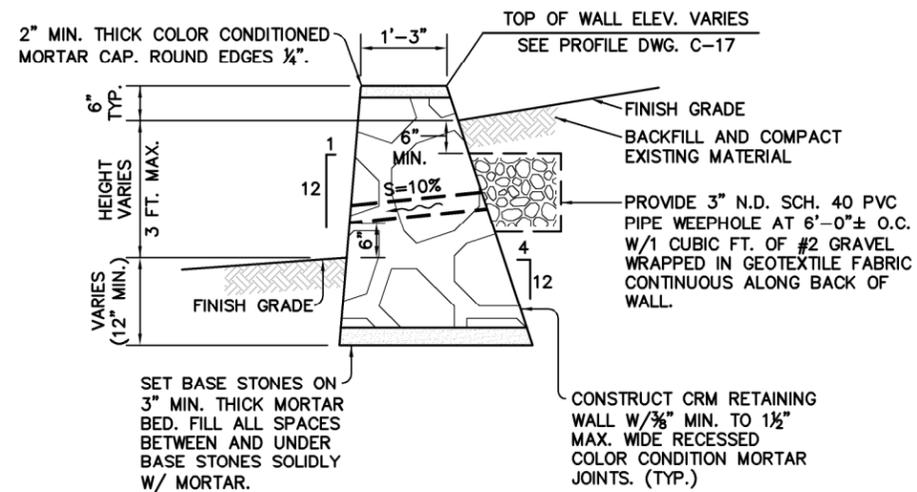
REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

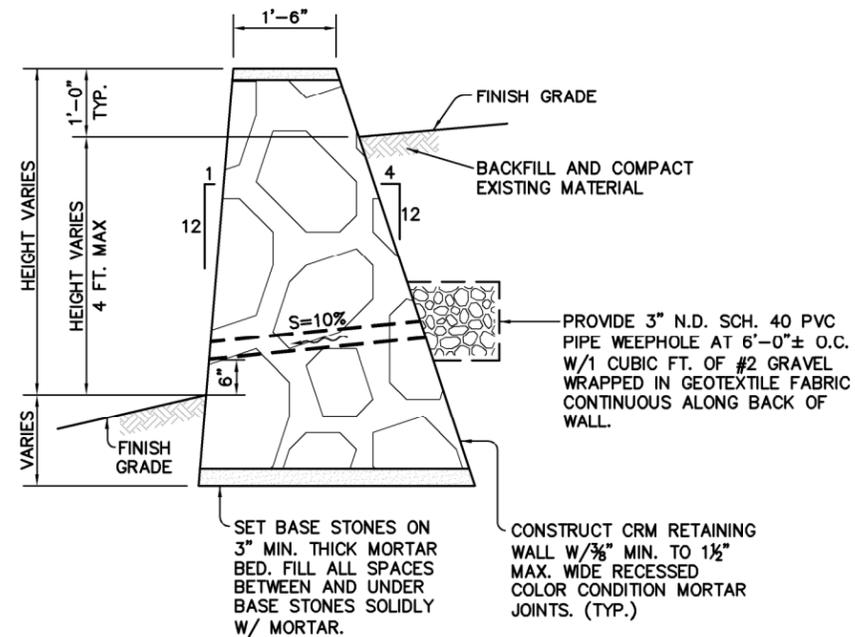
NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

CRM WALL PROFILES

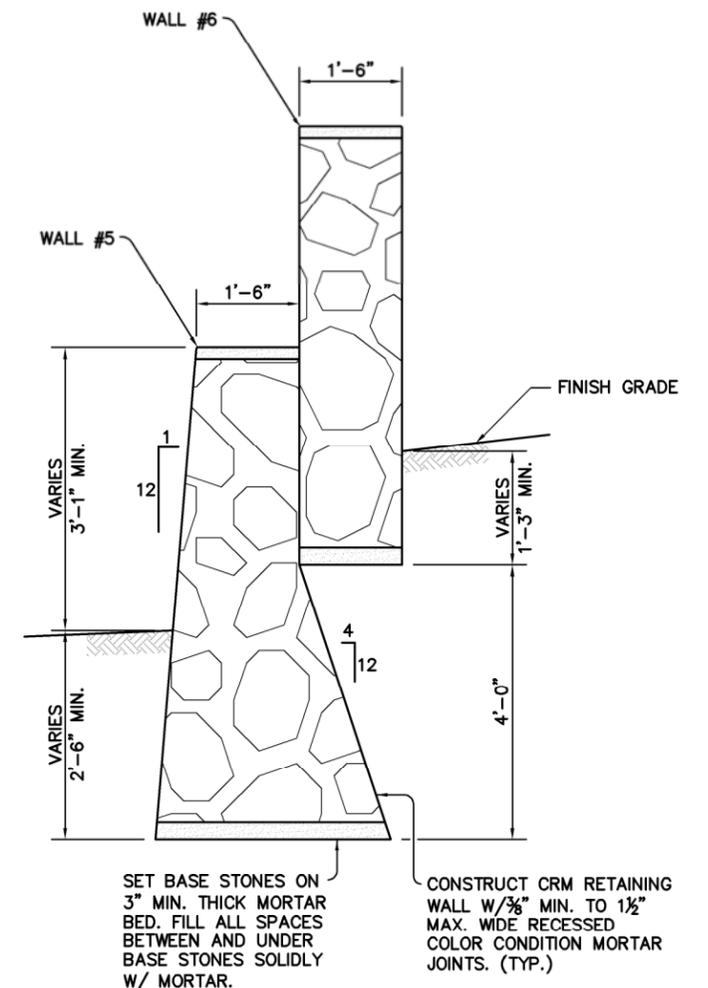
DESIGN: BIT	APPROVED:	DRAWING NO. C-17
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	SHEET 18
CHECKED: RMA	DATE	OF 31 SHEETS
DATE: JUNE 2013	FILE	DRAW
JOB NO. 33-13	DRAW	FOLDER
		NUMBER



CRM WALL TYPE "A" - SECTION
SCALE: 3/4" = 1'



CRM WALL #4 TYPE "B" - SECTION
SCALE: 3/4" = 1'



CRM WALLS #5 AND #6 - SECTION
SCALE: 3/4" = 1'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED

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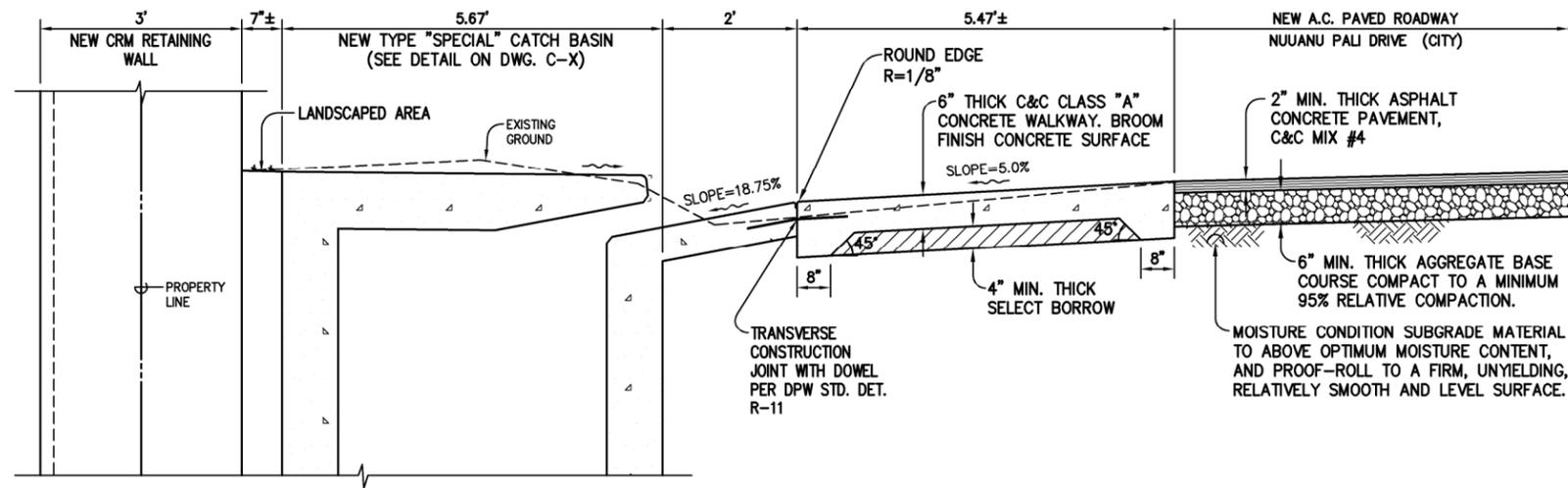
Page, Inc.
480 PARK ENGINEERING
LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

CRM WALL SECTIONS

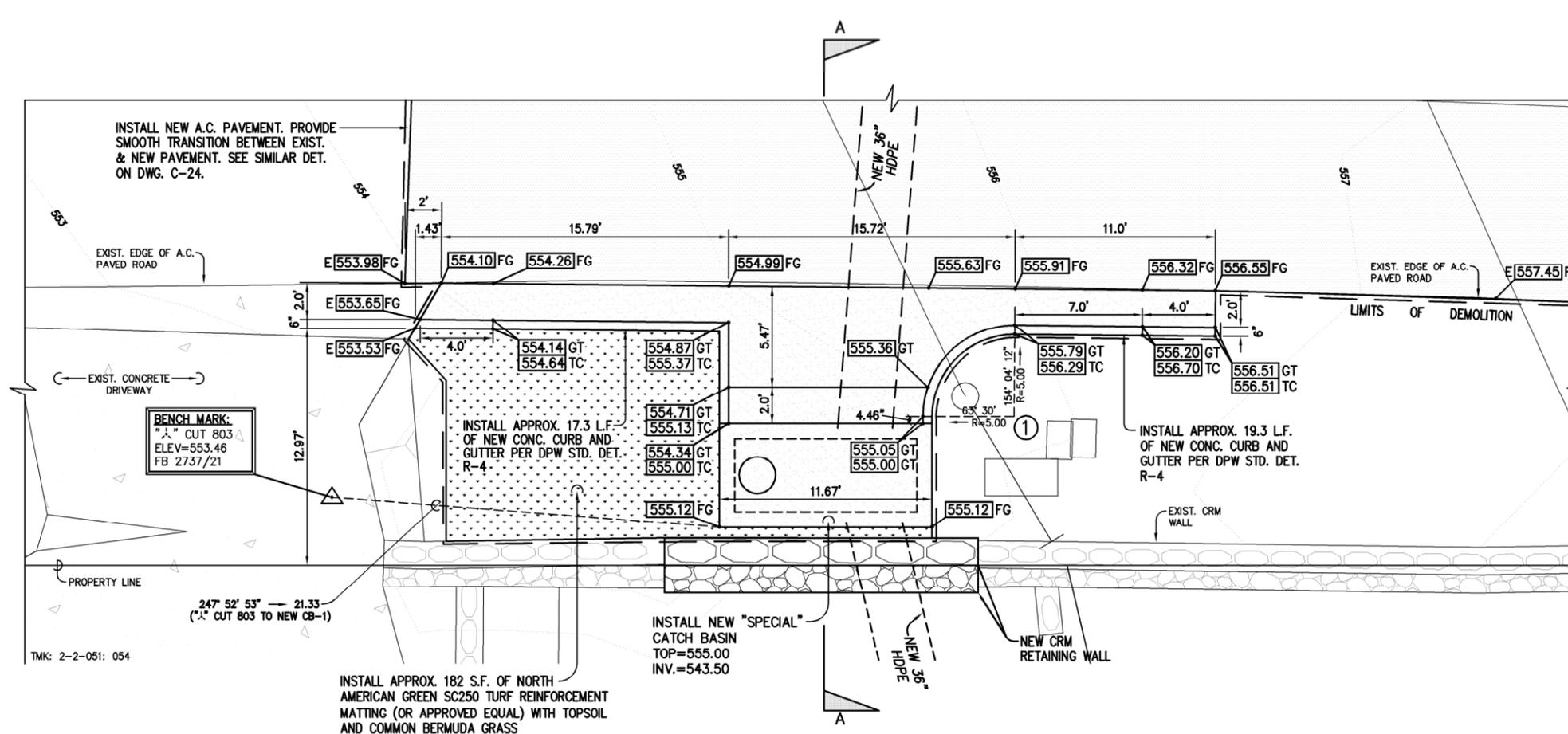
DESIGN: BIT	APPROVED:	DRAWING NO.
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	C-18
CHECKED: RMA		SHEET 19
DATE: JUNE 2013	DATE	OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW
	FOLDER	NUMBER



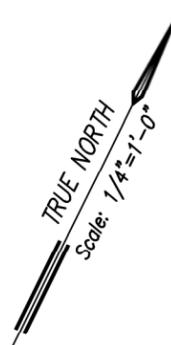
TYPE "SPECIAL" CATCH BASIN - SECTION "A"
SCALE: 3/4" = 1'-0"

CURVE DATA

①	
Δ	90° 34' 11.532"
Δ/2	45° 17' 5.766"
R	5.00
T	5.05
C	7.11
Lc	7.90



TYPE "SPECIAL" CATCH BASIN - PLAN
SCALE: 1/4" = 1'-0"



LEGEND:

- E 563.58 FG NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
- 563.56 FG NEW FINISH SPOT GRADE
- 564.06 TC NEW TOP OF CURB ELEV.
- 563.56 BC NEW BOTTOM OF CURB ELEV.
- 561.99 GT NEW GUTTER ELEV.
- [Pattern] NEW A.C. PAVEMENT
- [Pattern] NEW LANDSCAPING
- LIMITS OF WORK

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



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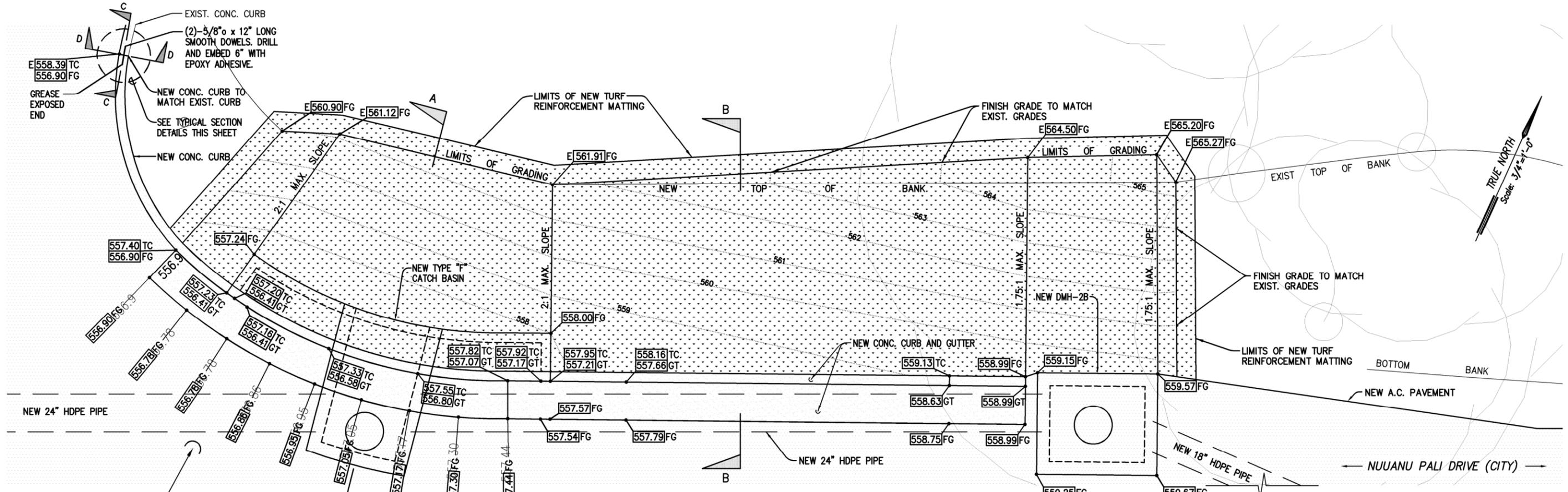
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

ENLARGED PLAN - TYPE 'SPECIAL' CATCH BASIN	
DESIGN: BIT	APPROVED:
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC
CHECKED: RMA	DATE
DATE: JUNE 2013	DATE
JOB NO. 33-13	FILE ___ DRAW ___ FOLDER ___ NUMBER ___

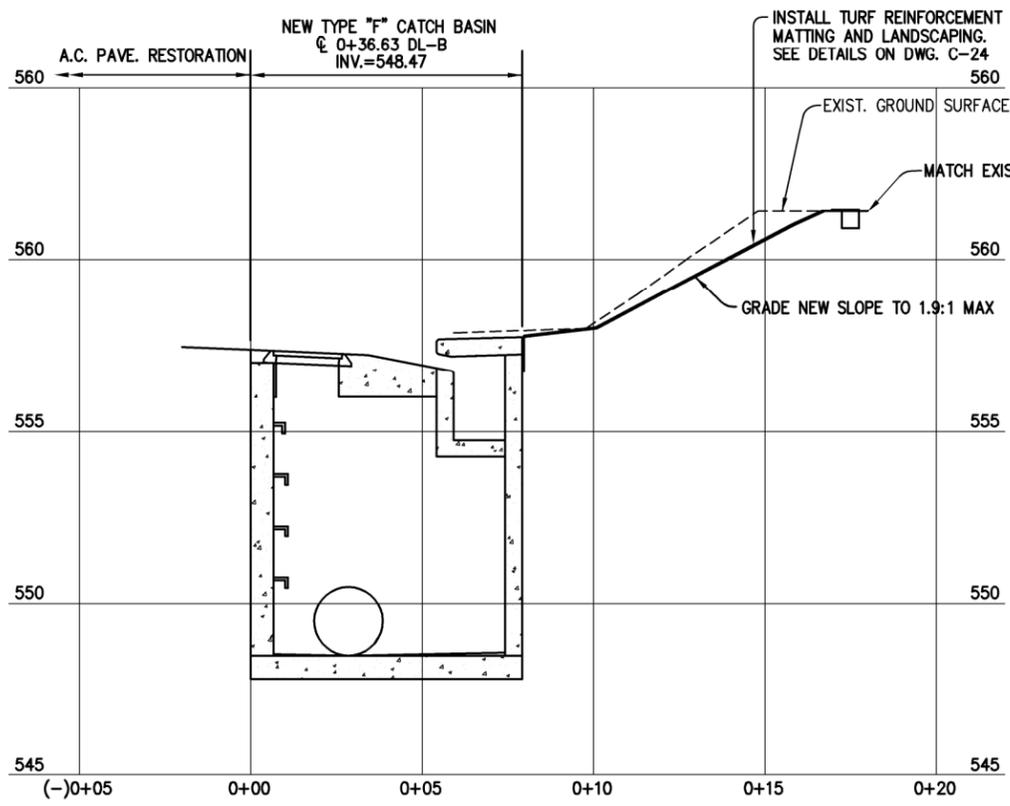
TMK: 2-2-051: 054

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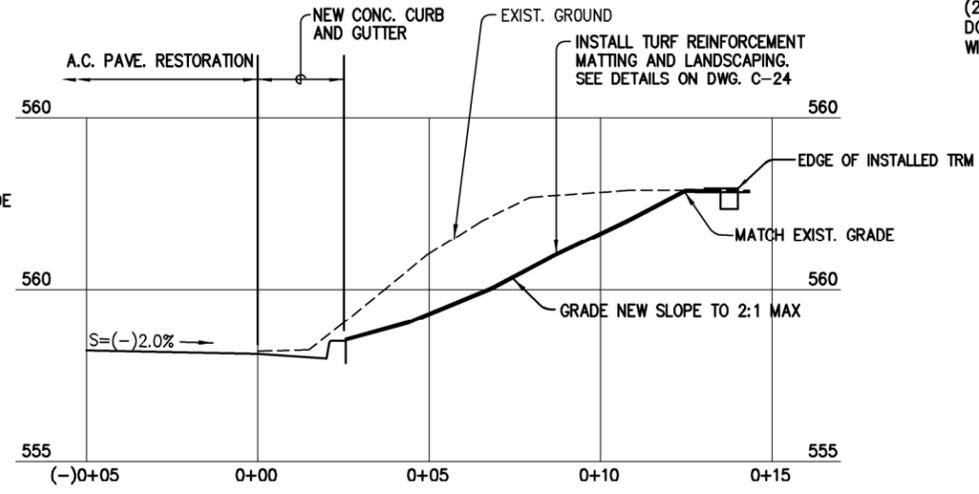
DRAWING NO.
C-19
SHEET 20
OF 31 SHEETS



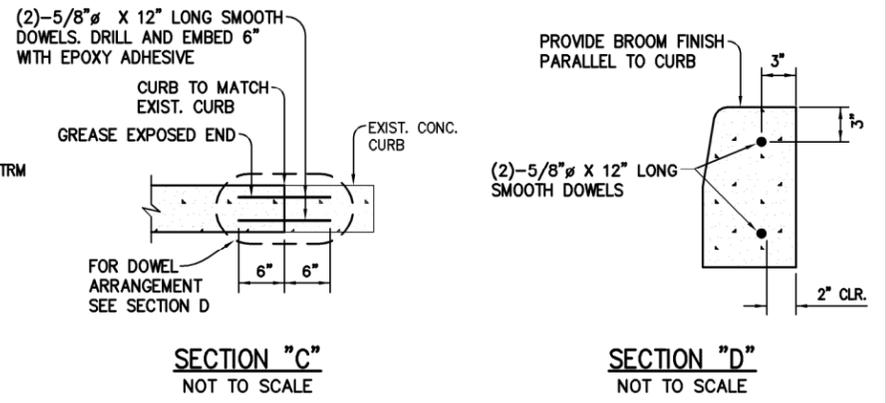
ENLARGED PLAN - DRAIN LINE B #1
SCALE: 3/4" = 1'-0"



SECTION-A
CATCH BASIN GRADED SECTION
SCALE: 3/4" = 1'-0"



SECTION-B
TYP. GRADED SECTION
SCALE: 3/4" = 1'-0"



- LEGEND:**
- E[563.58] FG NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
 - [563.56] FG NEW FINISH SPOT GRADE
 - [564.06] TC NEW TOP OF CURB ELEV.
 - [563.56] BC NEW BOTTOM OF CURB ELEV.
 - [561.99] GT NEW GUTTER ELEV.
 - [Pattern] NEW A.C. PAVEMENT
 - [Pattern] NEW TURF REINFORCEMENT MATTING
 - [Pattern] NEW CONC. CURB AND GUTTER

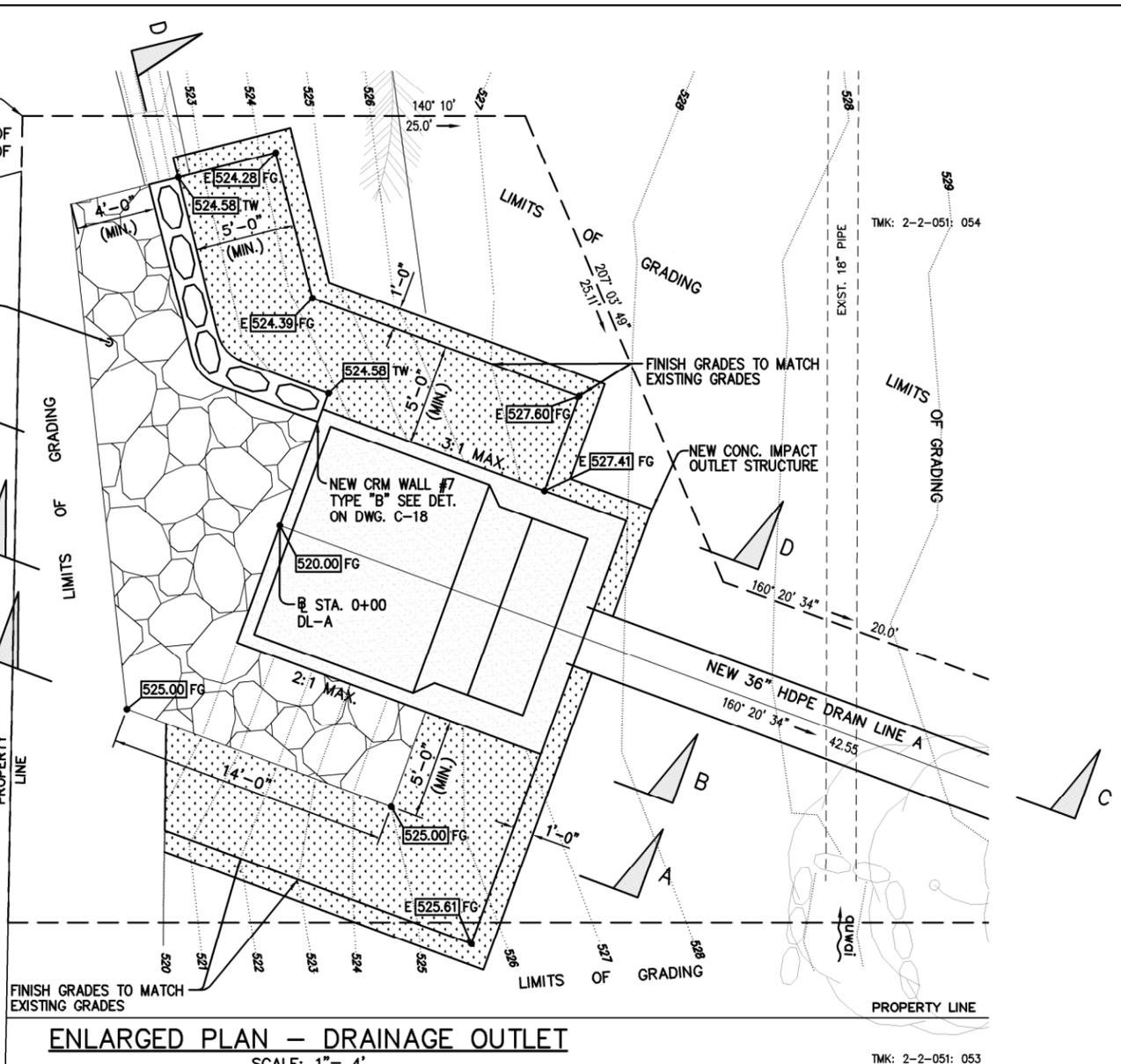
DEPARTMENT OF DESIGN AND CONSTRUCTION CITY AND COUNTY OF HONOLULU CIVIL DIVISION			
NUUANU PALI DRIVE AND OLD PALI ROAD STORM DRAINAGE IMPROVEMENTS TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10 NUUANU, HONOLULU, OAHU, HAWAII			
ENLARGED PLAN - DRAIN LINE B #1			
DESIGN: BIT DRAWN: NGA CHECKED: RMA DATE: JUNE 2013	APPROVED: CHIEF, CIVIL DIVISION, DDC	DRAWING NO. C-20	SHEET 21 OF 31 SHEETS
JOB NO. 33-13	FILE	DRAW	FOLDER

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 PgrEn, Inc.
 480 PARK ENGINEERING
 LICENSE EXPIRES 4-30-14



PROPOSED 40-FT. WIDE DRAINAGE EASEMENT TO BE GRANTED IN FAVOR OF THE CITY AND COUNTY OF HONOLULU.

TMK: 2-2-051:031



ENLARGED PLAN - DRAINAGE OUTLET
SCALE: 1" = 4'

TMK: 2-2-051: 053

NOTES:

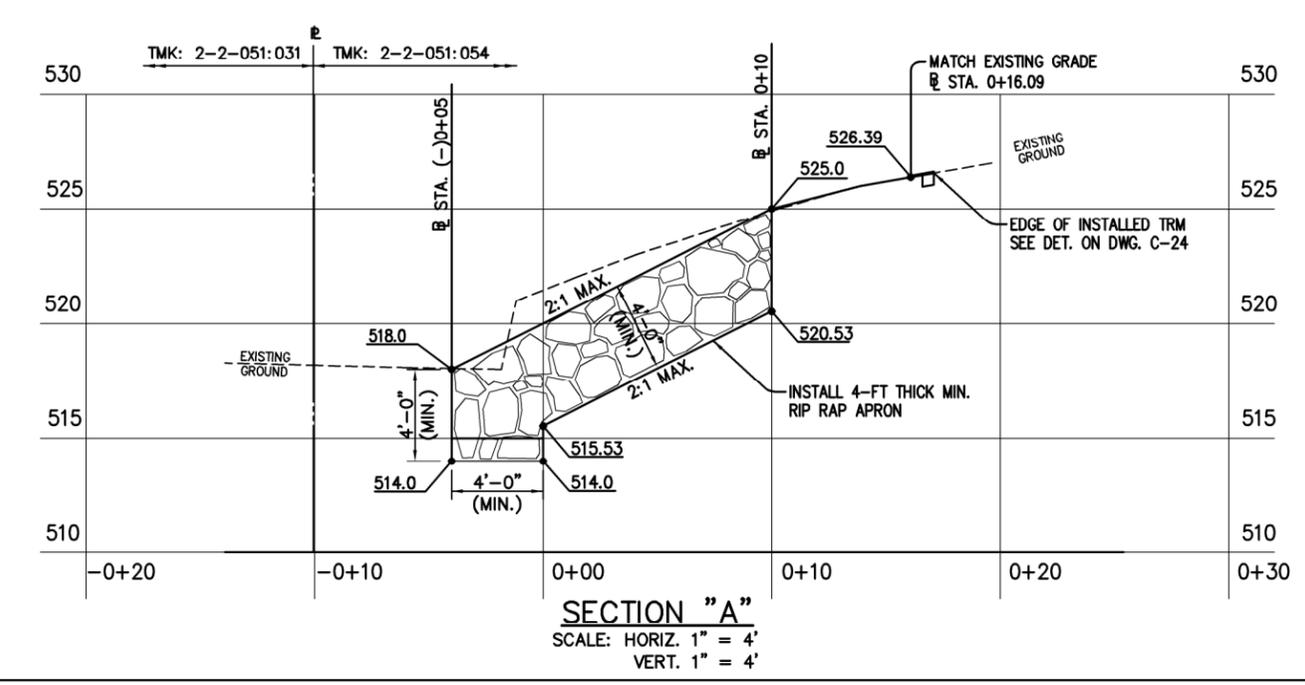
1. REMOVE AND DISPOSE EXISTING TREES AS REQUIRED FOR CONSTRUCTION OF THE OUTLET IMPROVEMENTS.
2. SEE DWG C-23 FOR SECTIONS

DUMPED RIPRAP GRADATION

% PASSING	STONE SIZE (FT.)	
D ₁₀₀	3.5	TO 4.0
D ₈₅	2.8	TO 3.3
D ₅₀	2.35	TO 2.7
D ₁₅	0.95	TO 1.4

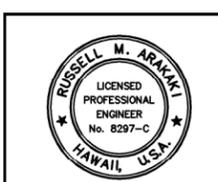
LEGEND:

- E [523.56] FG NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
- [523.56] FG NEW FINISH SPOT GRADE
- [524.58] TW NEW TOP WALL FINISH GRADE ELEVATION
- [Pattern] NEW TURF REINFORCEMENT MATTING
- [Pattern] NEW CONC. CURB AND GUTTER



SECTION "A"
SCALE: HORIZ. 1" = 4'
VERT. 1" = 4'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



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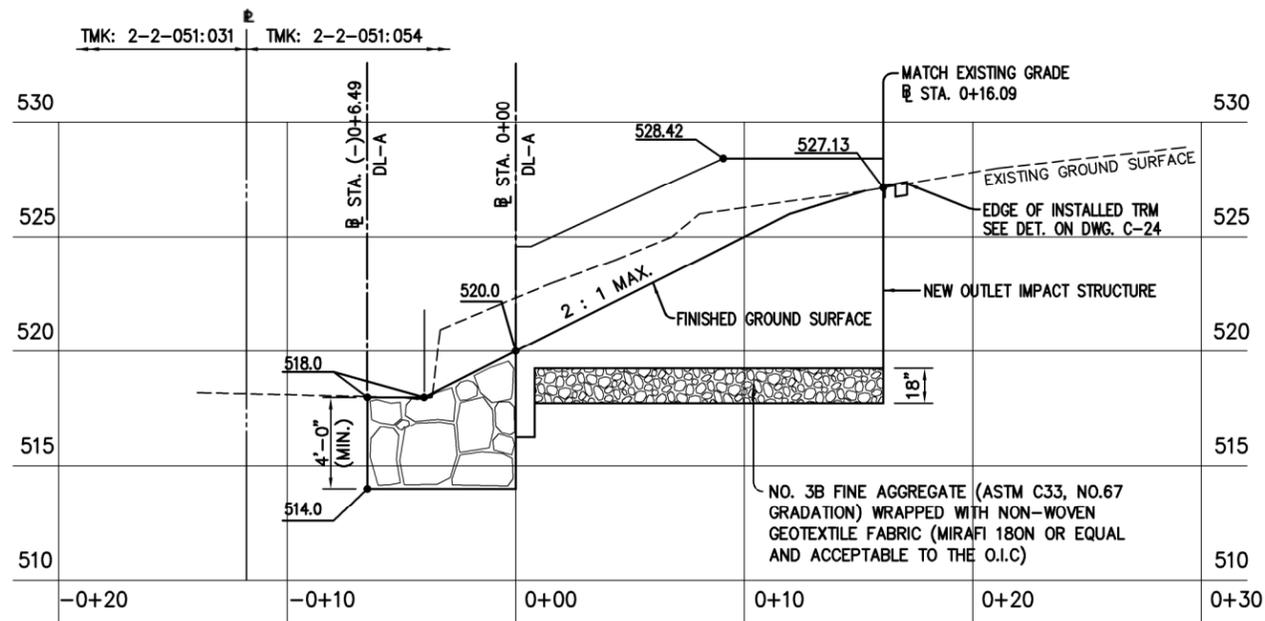
PgrEn, Inc.
480 PARK ENGINEERING
LICENSE EXPIRES 4-30-14

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

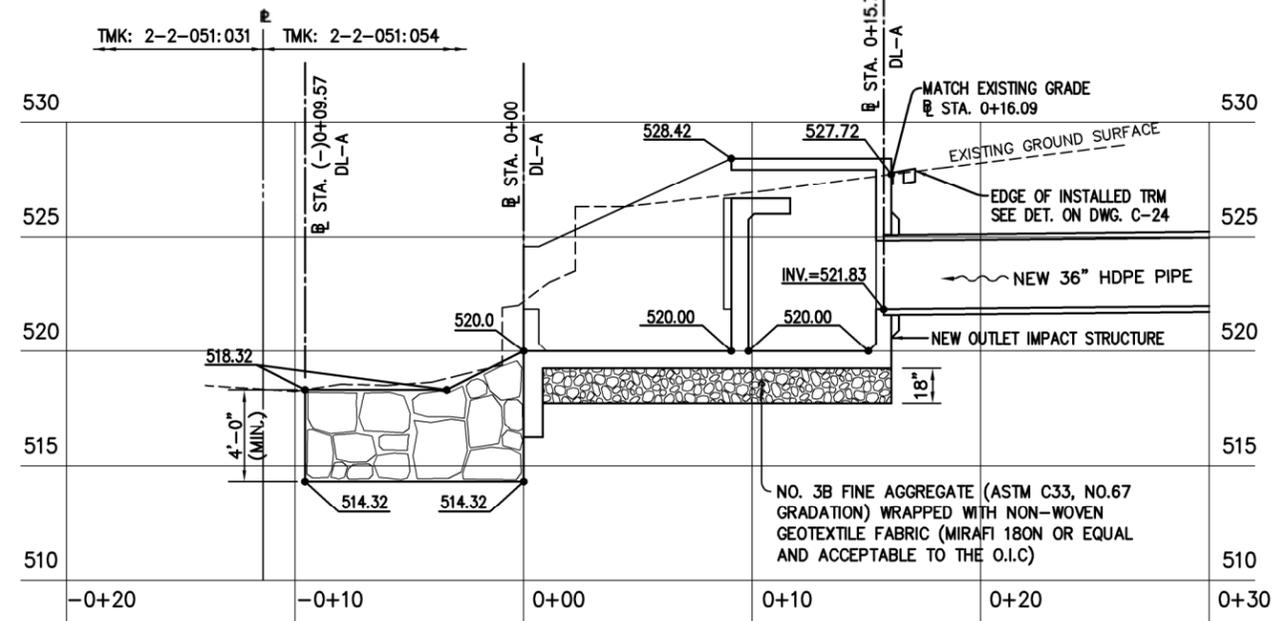
NUUANU PALI DRIVE AND OLD PALI ROAD
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TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

ENLARGED PLAN - DRAINAGE OUTLET

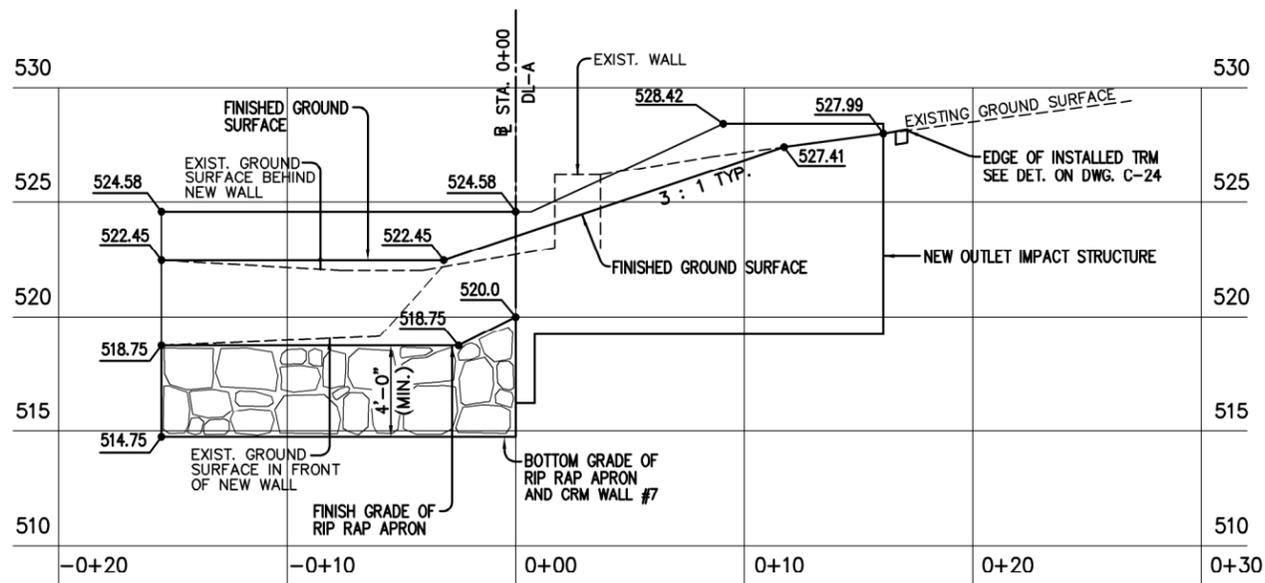
DESIGN: BIT	APPROVED:	DRAWING NO. C-22
DRAWN: NGA	CHIEF, CIVIL DIVISION, DDC	SHEET 23
CHECKED: RMA		OF 31 SHEETS
DATE: JUNE 2013	DATE	
JOB NO. 33-13	FILE	DRAW FOLDER NUMBER



SECTION "B"
 SCALE: HORIZ. 1" = 4'
 VERT. 1" = 4'

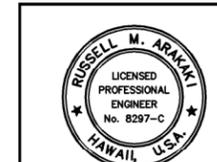


SECTION "C"
 SCALE: HORIZ. 1" = 4'
 VERT. 1" = 4'



SECTION "D"
 SCALE: HORIZ. 1" = 4'
 VERT. 1" = 4'

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



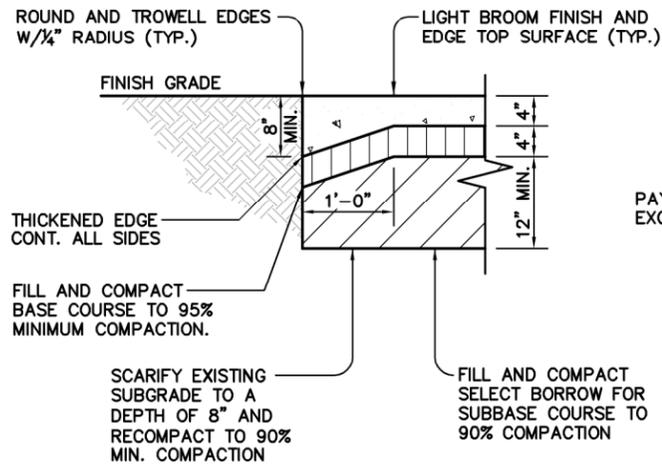
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. ("OBSERVATION OF CONSTRUCTION" SHALL BE AS DEFINED IN CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII, SUBCHAPTER 1, SECTION 16-115-2, DEFINITIONS, EFFECTIVE 09/29/94).

PgrEn, Inc.
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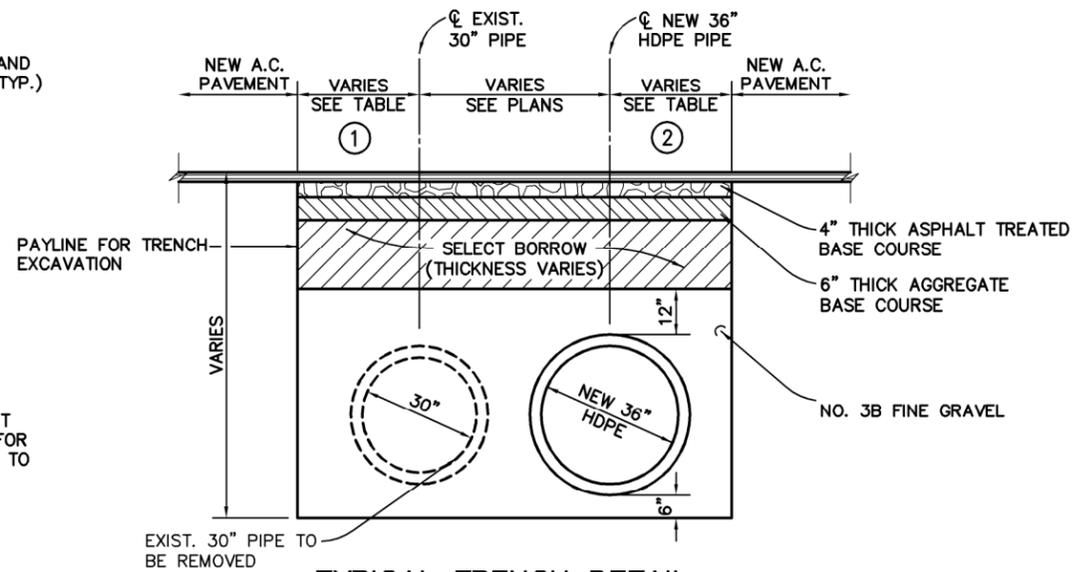
DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY AND COUNTY OF HONOLULU
CIVIL DIVISION
 NUUANU PALI DRIVE AND OLD PALI ROAD
 STORM DRAINAGE IMPROVEMENTS
 TMK: 2-2-51:054, 1-9-04, 05, 08, 09, AND 10
 NUUANU, HONOLULU, OAHU, HAWAII

ENLARGED PLAN - DRAINAGE OUTLET

DESIGN: BIT	APPROVED:	DRAWING NO. C-23
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	SHEET 24
CHECKED: RMA	DATE	OF 31 SHEETS
DATE: JUNE 2013	FILE	DRAW
JOB NO. 33-13	FOLDER	NUMBER



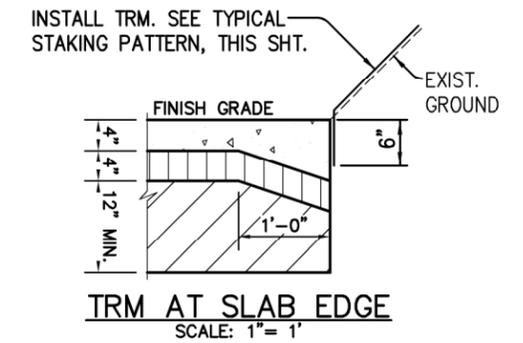
SLAB EDGE DETAIL
SCALE: 1" = 1'



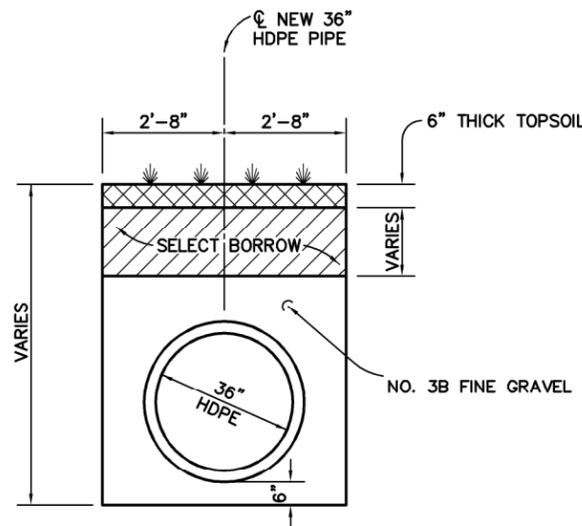
TYPICAL TRENCH DETAIL
(PAVEMENT AREAS WITH EXIST. 30" PIPE)
SCALE: 1/2" = 1'

DISTANCE FROM ϕ PIPE TRENCH EXCAVATION TABLE

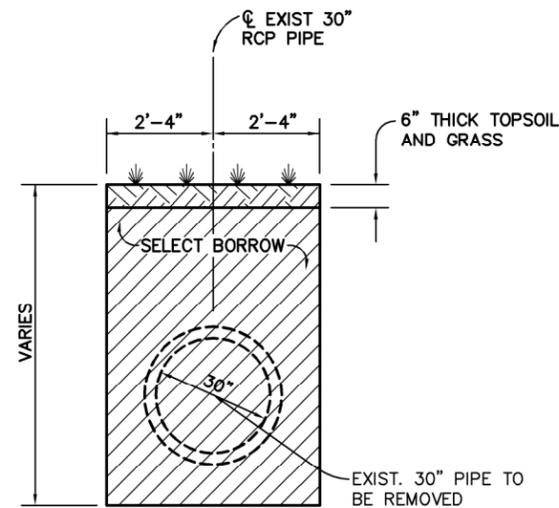
PIPE SIZE	①	②
18"	1'-6" SPACING	1'-6" SPACING
24"	2'-0" SPACING	2'-0" SPACING
30"	2'-4" SPACING	2'-4" SPACING
36"		2'-8" SPACING



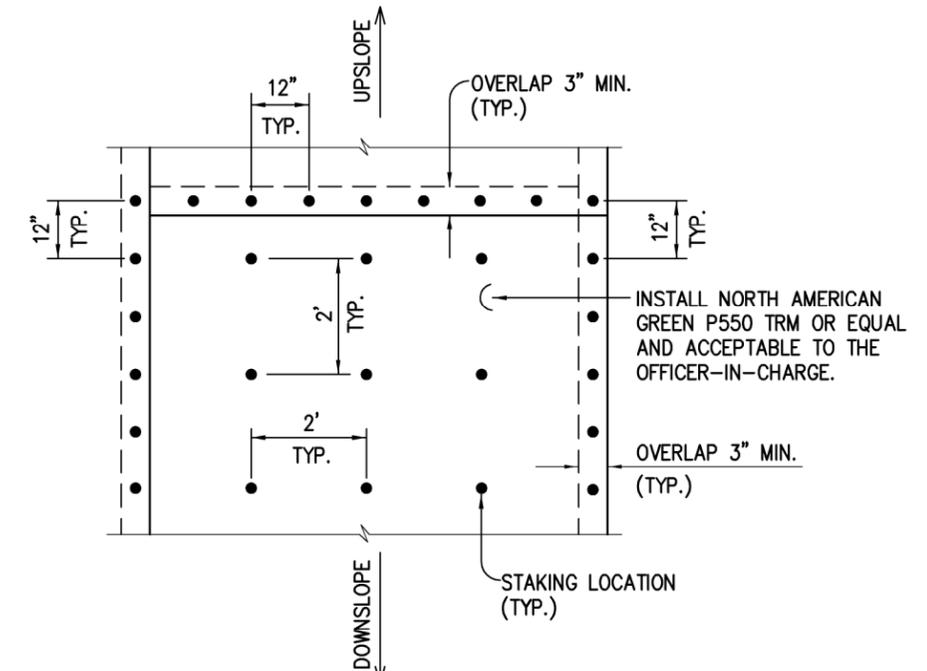
TRM AT SLAB EDGE
SCALE: 1" = 1'



TYPICAL TRENCH INSTALLATION DETAIL
(NON-PAVEMENT AREA)
SCALE: 1/2" = 1'

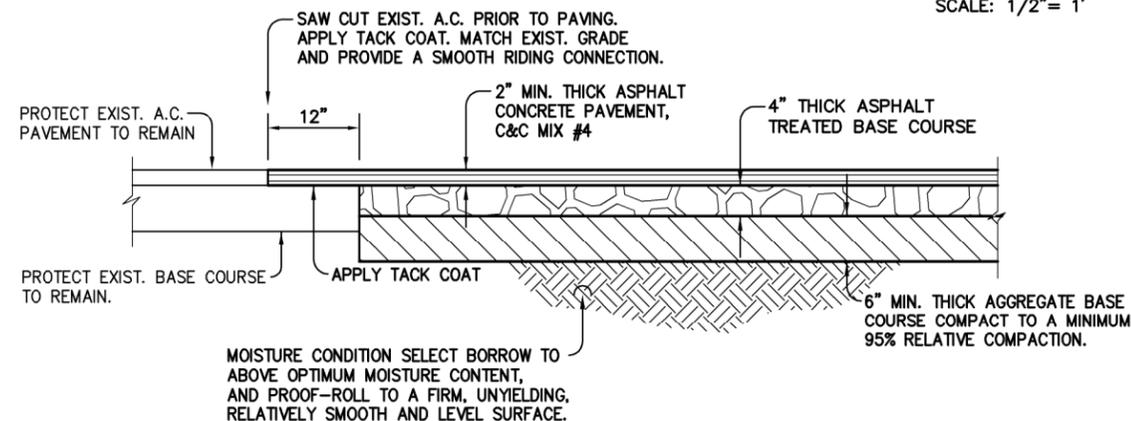


TYPICAL PIPE REMOVAL TRENCH DETAIL
(NON-PAVEMENT AREA)
SCALE: 1/2" = 1'



NOTE: INSTALL 3.4 STAKES (MIN.) PER SQUARE YARD

TYPICAL TRM STAKING PATTERN
SCALE: 1" = 1'-0"

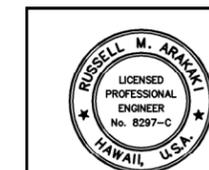


A.C. PAVEMENT CONNECTION DETAIL
SCALE: 1" = 1'-0"

TURF REINFORCEMENT MATTING (TRM) NOTES:

1. REMOVE EXISTING VEGETATION, INSTALL TOPSOIL AS REQUIRED, FINE GRADE, HYDROMULCH AND INSTALL TRM PRIOR TO LANDSCAPING.
2. THE CONTRACTOR SHALL OBTAIN ACCEPTANCE OF THE PREPARED SURFACE FROM THE OFFICER-IN-CHARGE PRIOR TO INSTALLING THE TRM.
3. THE TRM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS OTHERWISE INDICATED IN THE PLANS OR AUTHORIZED BY THE OFFICER-IN-CHARGE.
4. METAL (WIRE) STAPLES WILL NOT BE PERMITTED. ALL STAKES SHALL BE MADE OF TREATED WOOD TO THE LENGTH AND SHAPE AS RECOMMENDED BY THE MANUFACTURER OF THE TRM AND ACCEPTED BY THE OFFICER-IN-CHARGE.
5. AS DIRECTED BY THE OFFICER-IN-CHARGE, TREATED WOOD STAKES WITH LENGTHS 12-INCHES OR GREATER SHALL BE USED IN LOOSE SOIL CONDITIONS TO PROPERLY SECURE THE TRM AT NO ADDITIONAL COST TO THE CITY.

REVISION	DATE	DESCRIPTION	ENGR.	APPROVED



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DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
CIVIL DIVISION

NUUANU PALI DRIVE AND OLD PALI ROAD
STORM DRAINAGE IMPROVEMENTS
TMK: 2-2-51-054, 1-9-04, 05, 08, 09, AND 10
NUUANU, HONOLULU, OAHU, HAWAII

MISCELLANEOUS DETAILS

DESIGN: BIT	APPROVED:	DRAWING NO. C-24
DRAWN: NGA	CHEF, CIVIL DIVISION, DDC	SHEET 25
CHECKED: RMA	DATE	OF 31 SHEETS
DATE: JUNE 2013	FILE	DRAW
JOB NO. 33-13	FOLDER	NUMBER

APPENDIX B

Archaeological, Ethnographic, and Biological Survey of TMK: (1) 2-2-051:054, Nu‘uanu Ahupua‘a, Kona District, Island of O‘ahu, Hawai‘i

**FINAL—Archaeological, Ethnographic, and Biological Survey of
TMK: (1) 2-2-051:054, Nu‘uanu Ahupua‘a, Kona District, Island of
O‘ahu, Hawai‘i**



Prepared For:

Environmental Communications, Inc.
1188 Bishop St., Suite 2210
Honolulu, Hawai‘i 96813

Prepared By:

Garcia and Associates
146 Hekili St., Suite 101
Kailua, HI 96734



December 2007

**FINAL—Archaeological, Ethnographic, and Biological Survey of
TMK: (1) 2-2-051:054, Nu‘uanu Ahupua‘a, Kona District, Island of
O‘ahu, Hawai‘i**

Prepared For:

Environmental Communications, Inc.
1188 Bishop St., Suite 2201
Honolulu, Hawai‘i 96813

Prepared By:

Windy K. McElroy, PhD
Maria Orr, MA
and
Mike Desilets, MA

Garcia and Associates
146 Hekili St., Suite 101
Kailua, HI 96734



December 2007

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MANAGEMENT SUMMARY

Archaeological, ethnographic, and biological surveys were conducted at TMK: (1) 2-2-051:054 in Nu‘uanu Ahupua‘a, Kona District, on the island of O‘ahu, Hawai‘i for a drainage improvement undertaking. Archaeological survey identified no surface cultural remains but documented an *‘auwai* that runs beneath the surface in the project area. Ethnographic survey results showed that participants are concerned that the *‘auwai* is not compromised any further; and that the flow of water downstream will not be jeopardized. The biological survey and wetlands assessment concluded that Nu‘uanu Stream itself would not be impacted by the undertaking, no wetlands are present in the area, and that it is unlikely that state or federally listed species utilize the vicinity. Archaeological monitoring is recommended for ground disturbing work associated with the undertaking because of the likelihood of subsurface agricultural deposits.

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CONTENTS

Management Summary	i
Figures	iv
Tables	v
Appendices	v
1.0 INTRODUCTION	1
2.0 ENVIRONMENTAL AND CULTURAL BACKGROUND	4
2.1 Environment	4
2.2 Cultural Background	4
2.2.1 <i>Mo'olelo</i>	4
2.2.2 Traditional Land Use	6
2.2.3 Historic Period Land Use	7
2.2.4 Previous Archaeology	9
2.2.7 Summary of Background Information	10
3.0 ARCHAEOLOGICAL SURVEY	14
3.1 Methods	14
3.2 Results	14
4.0 ETHNOGRAPHIC SURVEY	17
4.1 Introduction	17
4.2 Methods	17
4.2.1 Personnel	17
4.2.2 Level of Effort	17
4.2.3 Theoretical Approach	17
4.2.4 Consultant Selection	18
4.2.5 Interview Process	18
4.2.6 Transcribing-Editing Process	18
4.2.7 Ethnographic Analysis Process	18
4.2.8 Research Problems	18
4.3 Ethnographic Survey (Oral History Interviews) and Analysis	19
4.3.1 Research Themes or Categories	19
4.3.2 Consultant Background and Demographics	19
4.3.1 Guy Lageman	20
4.3.2 Ben Sills	20
4.3.3 Jeannine Sills	21
4.3.4 Shannon Heath Wilson	21

4.4 Land Resources and Use	22
4.4.1 Project Property	22
4.4.2 Nu‘uanu: Project Area and Vicinity Flora	23
4.4.3 Pahoā ‘Auwai Taro, or <i>Kalo</i>	25
4.4.4 Nu‘uanu Cattle.....	25
4.5 Water Resources and Use.....	25
4.5.1 Nu‘uanu Stream/‘ <i>Auwai</i> History	26
4.5.2 Board of Water Supply and Nu‘uanu ‘ <i>Auwai</i>	27
4.5.3 Nu‘uanu Valley ‘ <i>Auwai</i> Association.....	28
4.5.4 ‘ <i>Auwai</i> Benefits	29
4.5.5 ‘ <i>Auwai</i> /Stream Fauna.....	29
4.5.6 ‘ <i>Auwai</i> /Stream Laws/Legal System.....	30
4.5.7 ‘ <i>Auwai</i> /Stream Rules/Courtesy.....	31
4.5.8 ‘ <i>Auwai</i> Maintenance	31
4.5.9 ‘ <i>Auwai</i> and Stream Storm/Flooding Issues.....	32
4.5.10 ‘ <i>Auwai</i> System/Storm Drain Network	33
4.5.11 ‘ <i>Auwai</i> Erosion	34
4.5.12 Project Site ‘ <i>Auwai</i> /Storm Drain Improvements	34
4.5.13 ‘ <i>Auwai</i> /Stream and Health Issues	37
4.5.14 Nu‘uanu Weather/Rainfall.....	37
4.6 Cultural Resources and Use	37
4.6.1 Project Area and Vicinity: <i>Lo ‘i</i>	38
4.6.2 Project Vicinity: <i>Wahi Pana</i>	38
4.7 Project Concerns	39
4.7.1 Project: Storm Drainage Improvement.....	39
4.8 Cultural Impact Study Summaries And Assessment.....	39
4.8.1 Guiding Documents	39
4.8.2 Summary of Findings	40
4.8.3 Cultural Properties/Practices Directly Affected by the Proposed Project:.....	45
4.9 Cultural Impact Assessment.....	45
4.9.1 Cultural Resource (Land) Impact	45
4.9.2 Cultural Practices/Access (Land) Impact.....	45
4.9.3 Cultural/Historical Resource (Feature) Impact.....	45
4.9.4 Recommendations/Mitigation.....	45
5.0 CONCLUSION AND RECOMMENDATIONS	47
6.0 GLOSSARY	48
7.0 REFERENCES	50

FIGURES

Figure 1. Island of O‘ahu, showing <i>ahupua‘a</i> boundaries and project location.	2
Figure 2. Project location on 7.5 minute USGS Honolulu Quadrangle.	3
Figure 3. Proposed drain line and alignment of modified (subsurface) ‘ <i>auwai</i>	15
Figure 4. Proposed drain route and ‘ <i>auwai</i>	15
Figure 5. TMK map showing the <i>mauka</i> portion of Paho‘a ‘ <i>Auwai</i> in red and the project parcel in yellow.	16
Figure 6. The Sills property; back yard.	22
Figure 7. Stone wall property boundary.	23
Figure 8. Sills ‘ <i>auwai</i> and pond.	23
Figure 9. <i>Kukui</i> in Sills back yard.	23
Figure 10. ‘ <i>Ape</i> and taro in back yard.	24
Figure 11. Taro in Sills part of Nu‘uanu Stream.	24
Figure 12. Taro struggling through Impatiens.	25
Figure 13. ‘ <i>Auwai</i> runs thru pipeline; former <i>lo‘i kalo</i> now City park.	25
Figure 14. Queen Emma Summer Palace.	26
Figure 15. Paho‘a ‘ <i>Auwai</i> leading to headwaters (right and middle), Nu‘uanu Stream headwaters (left).	26
Figure 16. Paho‘a ‘ <i>Auwai</i> from Sills’ neighbor (right); Sills’ underground portion (middle); Sills’ open section (left).	27
Figure 17. Lageman’s and two views of Wilson’s section of Paho‘a ‘ <i>Auwai</i>	27
Figure 18. Sills’ ‘ <i>auwai</i> /fish pond.	29
Figure 19. Clam (right); Sills’ carp (left).	29
Figure 20. Wild duck.	30
Figure 21. Storm drain from street level.	33
Figure 22. Underground to Sills’ property; under the ‘ <i>auwai</i> to white trellis.	35
Figure 23. Nu‘uanu Stream side of white trellis where storm pipe exits under Sills’ property.	35
Figure 24. Property Plans illustrating storm drain easement crossing ‘ <i>auwai</i> on Sills’ property to Nu‘uanu Stream.	36
Figure 25. Two areas in Sills’ yard with evidence of sinkholes.	37

TABLES

Table 1. Previous Archaeology in Nu‘uanu Ahupua‘a	11
Table 2. Consultant Demographics in Relation to Project Lands.....	19

APPENDICES

Appendix A: Biological Survey and Wetland Assessment	58
Appendix B: Guidelines for Assessing Cultural Impacts.....	65
Appendix C: Bill for Environmental Impact Statements	69
Appendix D: Consent Form	72
Appendix E: Basic Research Instrument for Oral History Interviews	76
Appendix F: Signed Consent Forms	79
Appendix G: Signed Release Forms	83
Appendix H: Scope of Work Cultural Impact Assessment.....	86

1.0 INTRODUCTION

At the request of Environmental Communications, Inc., Garcia and Associates (GANDA) conducted an archaeological inventory survey, ethnographic survey, biological survey, and wetlands assessment for an area proposed for storm drain improvements. The primary focus on the surveys and assessment was on the discovery and appropriate treatment of historic properties potentially affected by the undertaking.

The project site is located on the island of O‘ahu, in the district of Kona, in Nu‘uanu Ahupua‘a, at TMK:2-2-051:054 (Figure 1 and Figure 2). This is on Nu‘uanu Pali Drive, just *mauka* of the Kimo Road intersection. The parcel is owned by Ben Sills and is 0.404 ac. in area.

The undertaking will consist of improvements to an existing storm drain. The drain crosses the intersection of Old Pali Road and Nu‘uanu Pali Drive and continues down a steep slope through the project parcel, TMK:2-2-051:054. The east end of the storm drain empties into Nu‘uanu Stream, which cuts through the parcel. During heavy rain, leakage from the storm drain has caused sinkholes to occur in the project parcel, and this will be remedied by replacing the existing storm drain pipe.

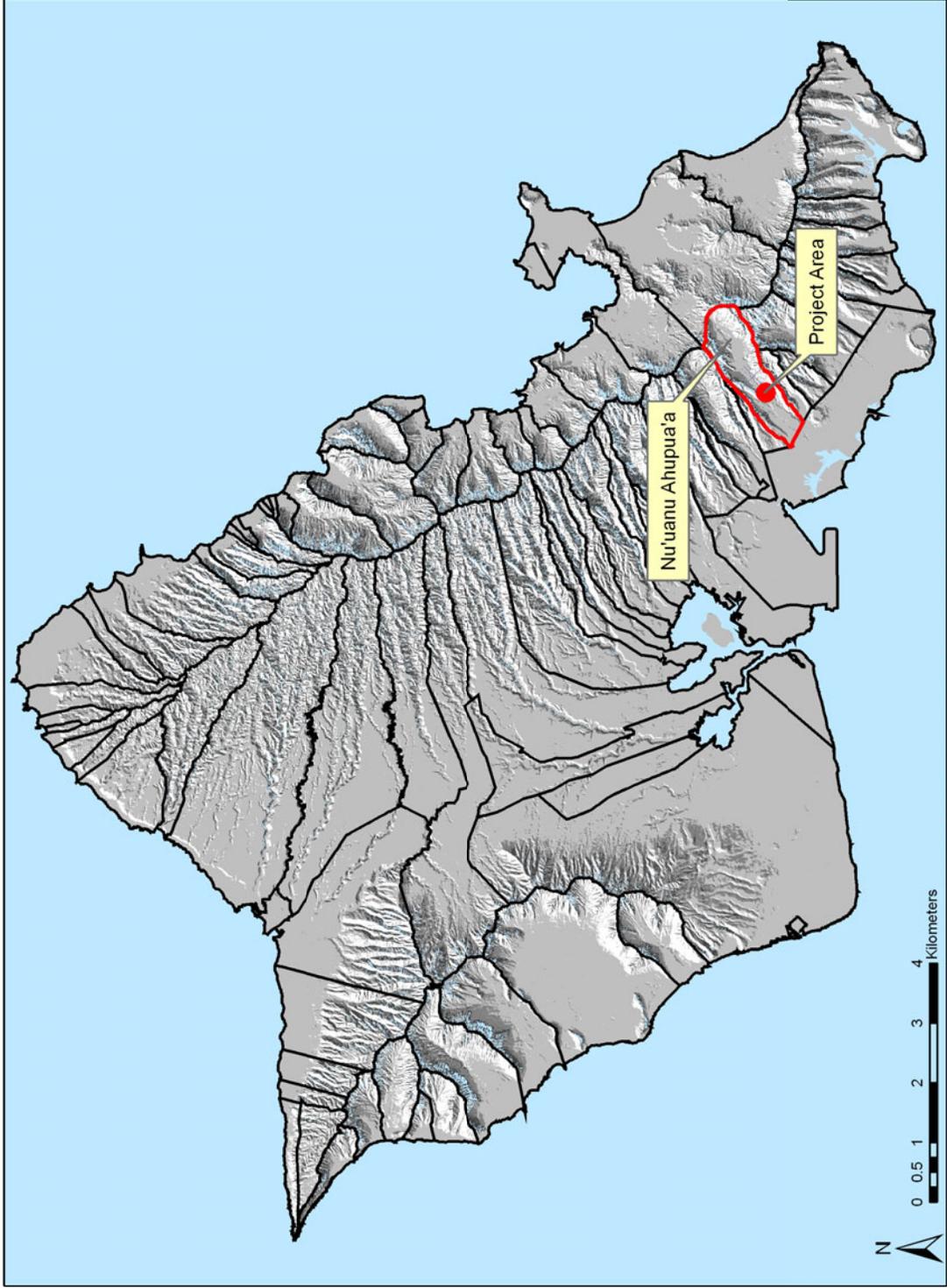


Figure 1. Island of O'ahu, showing *ahupua'a* boundaries and project location.

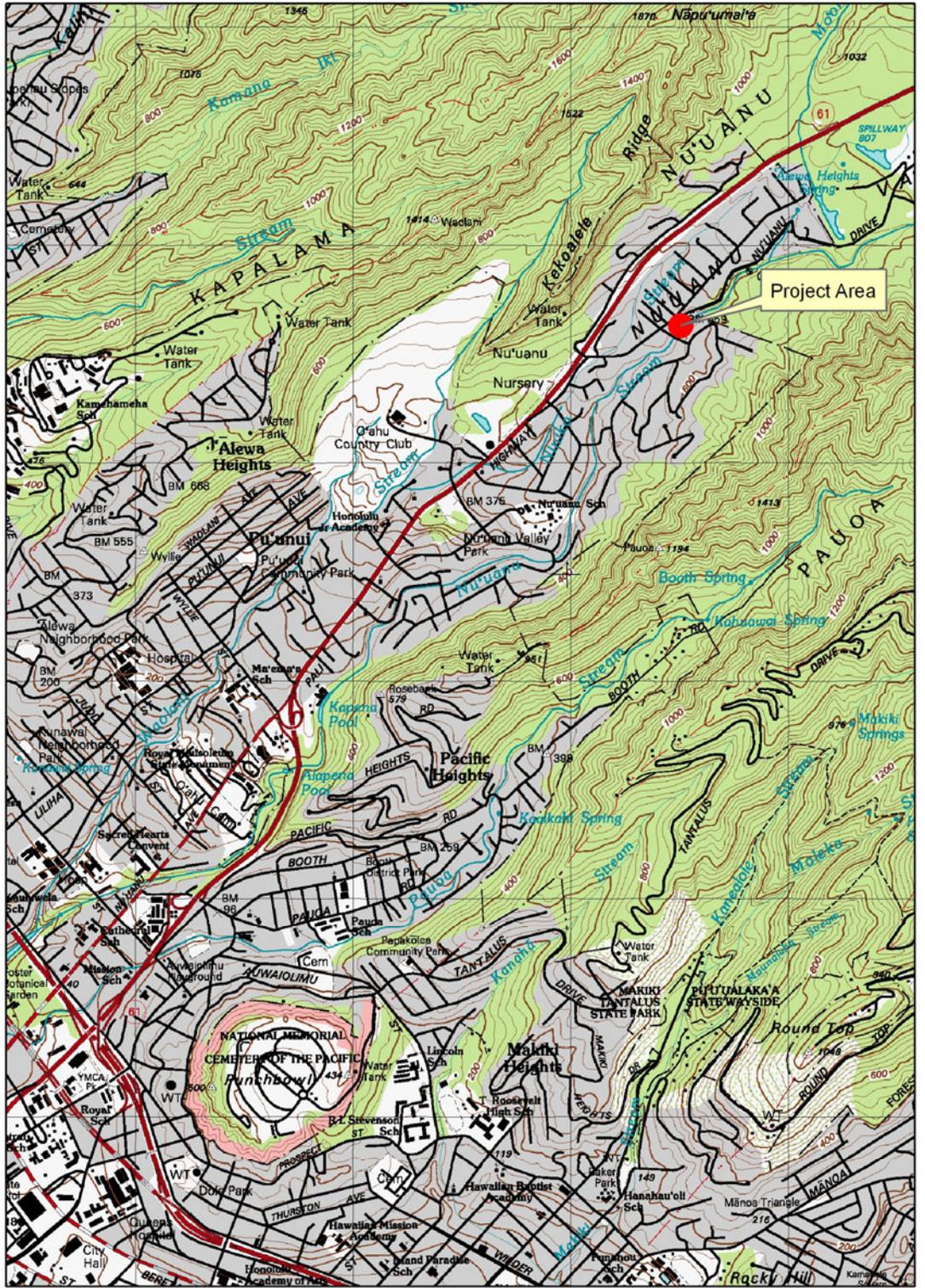


Figure 2. Project location on 7.5 minute USGS Honolulu Quadrangle.

2.0 ENVIRONMENTAL AND CULTURAL BACKGROUND

2.1 ENVIRONMENT

The property is a residential lot situated on a steep slope, bounded by Nu‘uanu Pali Drive on the west. Adjacent residential lots are located on the north, south, and east. Nu‘uanu Stream divides the parcel on the east side. The property is landscaped, and vegetation consists of short grass, a few *kukui* trees, *kalo*, ‘*ape*, ginger, and various ornamental and fruit trees.

Rainfall in Nu‘uanu ranges from 20 inches per year at the coast to 160 inches per year at the peaks of the Ko‘olau Mountains (Juvik and Juvik 1998:56). Average rainfall for Nu‘uanu Valley in the vicinity of the project area ranges from 80 to 100 inches per year (Juvik and Juvik 1998:56).

Soils in the project area belong to the Lolekaa Series, consisting entirely of Lolekaa silty clays on 40 to 70 percent slopes (Foote et al. 1972: Sheet 61). These soils developed in “old, gravelly colluvium and alluvium” and are well-drained (Foote et al. 1972:83). In steeply sloped terrain, such as the current project area, runoff is swift and there is a very high hazard for erosion.

2.2 CULTURAL BACKGROUND

This section presents background information that can be used to predict the kinds and distributions of historic properties that might still be present in the project area. This includes information on land-use patterns derived from available literature, public records, and maps, as appropriate. This information also provides context for understanding and evaluating the significance of historic properties.

2.2.1 *Mo‘olelo*

The name Nu‘uanu translates to “cool height” (Pukui et al. 1974:167), “cool terrace” (Lyons in Sterling and Summers 1978:293) or “notch in mountain” (Lyons in Sterling and Summers 1978:293). The place name refers to the cold wind, and the pinnacle of the Pali Trail was a *nu‘u*, or high place, to travelers approaching from the windward side of the island (Lyons in Sterling and Summers 1978:293).

In traditional times, Nu‘uanu was known as a place for robbers (Raphaelson in Sterling and Summers 1978:309). A hidden cave beyond Luakaha was the hiding place for two infamous robbers (Raphaelson in Sterling and Summers 1978:309). One would climb a tree as a lookout, and when he signaled to the second robber, the second robber would swing a *pīkoi* to trip the traveler. Then the two would rob, and sometimes murder, their victim. Another account relates that the robbers tied strings across the path to trip travelers and that they waited for their victims in a *hau* tree (Taylor in Sterling and Summers 1978:310).

It is said that a pack of supernatural dogs protected travelers on the Pali Trail (Taylor in Sterling and Summers 1978:298). The dogs belonged to a couple who lived near Kapena Falls in Nu‘uanu. One day, friends of the couple were traveling on the trail toward windward O‘ahu and the dogs howled and blocked the trail in front of them. One of the travelers returned home, but the other continued on the trail and was later killed by robbers. After the incident, people would leave food and flowers for the dogs when they passed by Kapena Falls to thank them for their warning.

Two rocks along the Pali Trail were known as sacred stones. Hapu‘u, on the ‘*ewa* side, was the male rock to whom pigs were offered, and Kalaihau‘ole, on the opposite side, was the female, to whom dogs were the proper offering (Emerson in Sterling and Summers 1978:312, 313). Another account

states that the two stones were once *mo'ō* guardians of the *pali*, and ferns were offered to the female stone and flowers were offered to the male (Westervelt in Sterling and Summers 1978:313). Another source identifies the two stones as the supernatural grandmothers of Pi'ikea, the royal consort of Umi a Liloa (Fornander in Sterling and Summers 1978:313). Hapu'u was said to be bad tempered, while Kalaihau'ole was kind and had healing powers (Sterling and Summers 1978:313). Pi'ikea was the daughter of Maui Mō'i Pi'ilani and his cousin/wife, O'ahu born La'ielohelohe of Waikīkī, daughter of Keleanuino'ana'api'api (sister of Pi'ilani's father) and chief Kalamakua (Hālawa/Waikīkī), first cousin of Līhu'e chief Lolae who was Kelea's first husband (Fornander 1880:83–87; 90–91; Kamakau 1991, 1992). Lolae was the son of O'ahu Mō'i Kalona-iki who was the brother of Kalona-nui and Piliwale (father of Kukaniloko).

Ellis (in Sterling and Summers 1978:312) mentions that the stones were called “akua no ka pari,” or “gods of the precipice,” and they stood on either side of the Pali Trail, wrapped in *kapa*. Hapu'u was also said to be a *piko* stone, where babies' umbilical cords were hidden (Haole in Sterling and Summers 1978:312).

A pond near School and Liliha Streets has an accompanying *mo'olelo* (Pukui et al. 1974:192; Poepoe in Sterling and Summers 1978:296). Papa, ancestor of the Hawaiian people, went to Nu'uaniu, where she met a farmer named Kali'u. The farmer told her that he was so named because the land in the vicinity had no water source. The land was cultivated only with rain water, and this was difficult in the dry summer months. Papa threw a large boulder at nearby Waolani Stream and a spray of water formed a spring on the farmer's lands. The spring fed a pool, known as Pūehuehu, or “spray scattered.”

Another pool, Kunawai, was known as a bathing pond for the *hānai* child of the rainbow goddess (Manu in Sterling and Summers 1978:296). The pond was owned by a *mo'ō*, or lizard, from whom the pond was named after. The pool was revered as sacred, and the land from the pond to Waolani was *kapu*. Another version of the *mo'olelo* states that the pond was named for an eel deity, and the chief who bathed there was raised by the gods Kāne and Kanaloa at Waolani Heiau (Pukui et al. 1974:124–125). The pond was located near Liliha Street and Kunawai Lane (Sterling and Summers 1978:296).

Pu'unui in Nu'uaniu is said to have been the home of the highest-ranking *mo'ō* in the islands, Mo'oinanea (Iararie in Sterling and Summers 1978:300). A clay pit that was still in existence in the Twentieth Century was her home.

Another *mo'olelo* tells of a race of hairless dogs that were related to the *mo'ō* (Sterling and Summers 1978:312). One of the dogs was killed and cooked on the Kona side of O'ahu by the Ko'olau people for tribute to their *ali'i*. As the cooked dog was being transported from Kona to Ko'olau, via the Nu'uaniu Pali, the cooked dog spoke, and the frightened people fled. The hairless dogs were not eaten since then, but their breed eventually died out (Sterling and Summers 1978:312).

Three accounts refer to Pu'iwa, a place in Nu'uaniu and also the name of a pool and a cave. The first account states that Pu'iwa was named for an event that occurred in the battle of Nu'uaniu. During the battle, Kamehameha fired a cannon at a stone wall until it fell. Behind the wall, Kalanikupule's men were startled, or “*pu'iwa*” (Ka Na'i Aupuni in Sterling and Summers 1978:302). The second account tells of a father who asked his daughters to bury him in Pu'iwa so that *wauke* trees would grow from his body (Westervelt in Sterling and Summers 1978:302). They carried out his request, and since that time, *kapa* could be made. The third source asserts that an ancestor of the Kaua'i chiefs was buried in a cave at Pu'iwa (Kamakau in Sterling and Summers 1978:302).

In times past, *menehune* of Nu‘uanu and Waolani fought over a large stone named Pōhaku a Umeume (Pukui in Sterling and Summers 1978:302). The stone is roughly 10 feet long and 4.5 feet high and is located near the O‘ahu Country Club (McAllister 1933:86). Small indentations can be seen along the edges of the stone, and these are the fingerprints of the *menehune*. The Waolani *menehune* gained possession of the stone and transported it to where it sits today (McAllister 1933:86). Another version of the *mo‘olelo* states that each group of *menehune* pulled the stone in opposite directions because one group wanted the stone to be moved *mauka* and the other *makai* (Webb in Sterling and Summers 1978:302). They continued pulling until dawn, when they dropped the stone in its current location and ran away. Another account reports that the *menehune* king was fighting a giant king and threw Pōhaku a Umeume at the giant from Pacific Heights (Wilder in Sterling and Summers 1978:303). It hit the giant in the head and killed him. Both the giant’s and the *menehune*’s fingerprints were left on the stone. Yet another rendition tells of Waolani and Puiwa, occupants of either side of the valley, fighting for the stone (Webb in Sterling and Summers 1978:303). Waolani pulled the stone harder and won it for his portion of the valley. It is his fingerprints that remain on the stone. Still another account states that the stone had powers associated with O‘ahu *ali‘i* Kakuhihewa (Hall in Sterling and Summers 1978:303). The stone could detect a descendant of Kakuhihewa, for only a person that could tilt the stone was a true descendant. The stone was also the location where those of the Kakuhihewa line would have their babies’ umbilical cords cut (Hall in Sterling and Summers 1978:303). If there was a dispute between the mother and father about the baby’s name or upbringing, the stone would decide. The mother or a member of her family would try to move the stone, and a father or a member of his family would attempt the same. The one who was successful won the argument. If neither side could tilt the stone, the priest of Waolani Heiau would choose the name of the baby and determine who would raise the child.

Kaheiki Heiau has an accompanying *mo‘olelo* (Nui in Sterling and Summers 1978:297). The *heiau* was built for Kahanai-a-ke-akua. Kahano and Newa were his caretakers. Kahano, a supernatural being, lay down on the floor of the ocean between Kahiki and O‘ahu, with one arm touching each place. This formed a bridge for the *menehune* to travel between Kahiki and O‘ahu to build Kaheiki Heiau.

Kaheiki Heiau is mentioned in another *mo‘olelo* (Beckwith in Sterling and Summers 1978:297). The son of a Hawai‘i Island chief was kidnapped for sacrifice in Līhu‘e, O‘ahu. The chief traveled to O‘ahu, where Kahilona, the *kahuna* of Kaheiki Heiau, taught him a prayer that would save his son. The prayer freed the son from bondage, and the chief and his son went into hiding. The chief later learned a prayer for killing his enemy, and he carried this out on Hawai‘i Island.

2.2.2 Traditional Land Use

Nu‘uanu Ahupua‘a was an important area in pre-Contact Hawai‘i. It contained the Pali Trail that bridged the windward and leeward sides of O‘ahu, and the valley had large tracts of good agricultural land. In addition, the bay now known as Honolulu provided a natural channel through the reef that led to a canoe landing, one of just a few such landings on the leeward side of the island. Nu‘uanu was densely populated and highly productive agriculturally, with lands under cultivation extending to the upper reaches of the *ahupua‘a* (Handy 1940; I‘i 1963). Irrigated taro, sugarcane, and banana were planted in the lowlands, while dryland taro and sweet potato were cultivated in the uplands (Handy 1940). Petroglyphs of both human and animal form are known to occur in Nu‘uanu as well. Those along the banks of Nu‘uanu Stream are well documented (McAllister 1933:83–84). There may have also been a *hōlua* slide on the ridge between Waolani and Nu‘uanu Valleys (McAllister 1933:86).

As a place of importance in pre-Contact Hawai‘i, Nu‘uanu was the home of many *heiau*. It is said that the first *heiau* were built in Waolani because this was the home of Wakea, ancestor of all Hawaiians (Thrum in Sterling and Summers 1978:304). One of the most prominent was Pākākā, a *heiau luakini*, which is located at the coast near the current site of Aloha Tower (Dixon et al. 1994:17). The position of Pākākā at the mouth of Nu‘uanu Stream afforded a clear view of the activities of the bay and commanded respect from anyone entering the *ahupua‘a*.

Another important *heiau* site was the Waolani complex, located on the northern ridge of Nu‘uanu. Waolani is thought to be among the earliest *heiau* on the island (McAllister 1933:84–85) and it was here that Wakea was born (Beckwith 1970:301). The complex is also associated with Mo‘oinanea, an ancient lizard deity (Beckwith 1970:507). Kawaluna Heiau was probably a component of the Waolani complex, and this was a *heiau luakini* of such importance that it could only be consecrated by the *mō‘ī* of O‘ahu. The *heiau* may have also functioned as a *pu‘uhonua* (McAllister 1933:85). A sacred stone for depositing the umbilical cords of the Kākuhihewa chiefly lineage was located above the *heiau*. Two *heiau* of the Waolani complex were remembered by Hawaiian informants in the early 1900s (McAllister 1933:86). One was located on Liliha Street and another on Nu‘uanu Street.

Kaheiki Heiau is another religious site of Nu‘uanu. It sat atop the ridge between Nu‘uanu and Pauoa (McAllister 1933:82). It was in this area that fires were lit to signal the coming of intruders over the Nu‘uanu Pali. Kahuoi was a husbandry *heiau* located near Kaheiki, but it was destroyed in the mid-Nineteenth Century (McAllister 1933:82).

2.2.3 Historic Period Land Use

Māhele Land Tenure

The following is a brief summary of the land tenure of Nu‘uanu presented in Dixon et al. (1994). The reader is referred to that document for further information regarding land tenure. The summary presented here emphasizes relevance to the project area.

When Kamehameha the Great united the islands and divided the land, he kept Nu‘uanu Ahupua‘a for himself. However, much of the land was given to his friends and supporters over the years, and these parcels became privately owned after the Great Māhele of 1848. Within Luakaha ‘Ili, lands were granted to John Young II, George Pelly, and others. Nevertheless, a large portion of the ‘ili of Luakaha was set aside for the private use of Kamehameha III, and became Crown Lands.

Nu‘uanu Battlegrounds

Nu‘uanu was regarded as an ancient battleground in traditional Hawai‘i (Kamakau 1992:291), and two battles of great significance took place in the ‘ili of Luakaha in the early historic era. The first was the battle in which Kahekili, chief of Maui, took control of O‘ahu in 1783 by defeating Kahahana, a resident of Nu‘uanu (Kamakau 1992). This deciding battle, in which Kahekili’s wife fought alongside her husband, is described by Kamakau:

In this battle the waters of the stream Kahe-iki [see description of Kaheiki Heiau above] ran red with blood from the heaps of broken corpses that fell into the water; the stream was dammed back with the corpses of those who died in the battle. On the ridge facing Pauoa and from thence down to Kapena another attack was made against the defense stationed back of the heiau of Kahe-iki. Confusion seized the ranks; the warriors of Ka-hahana were dispersed; Ka-hahana and Ke-kua-po‘i his wife fled to the forest. Ka-hekili’s wife Kau-wahine was also a noted fighter. Thus Oahu and Molokai were taken by Ka-hekili and Ka-‘opulupulu’s prophecy was fulfilled (Kamakau 1992:136).

The second major battle was part of the Battle of Nu‘uanu in 1795 in which Kamehameha the Great took control of O‘ahu, unifying all the major islands except Kaua‘i. A last stand was made by the O‘ahu army in Luakaha before they were forced over the cliffs of the Pali by Kamehameha’s forces, as recounted by Nakuina:

They tried to make a stand at Luakaha and at Kaniakapupu, the hill above, but were defeated by the superior forces under Kamehameha, and fleeing up the valley, were pursued and driven over the precipitous pali, thousands there meeting their death. The victory was so complete that not one of the Oahu army that got into the upper part of the valley escaped (Nakuina in Sterling and Summers 1978:318).

Another source pinpoints the main battleground to the lands just below the project area:

The major part of the battle occurred just above the present Queen Emma Museum on the land of Puiwa, which is now called Lanakila in memory of Kamehameha’s victory . . . (Alexander in Sterling and Summers 1978:318).

Thus two major battles involving the conquest of O‘ahu in the early historic period were fought in Nu‘uanu, and the *‘ili* of Luakaha was a significant battleground for both.

***Ali‘i* Land Use in Nu‘uanu**

The village of Kou, at the *makai* end of Nu‘uanu Ahupua‘a, was an important hub in historic Hawai‘i and later grew into the metropolis of Honolulu. Deep sea, inshore, and fishpond resources were available to the villagers, and the natural channel in the bay that fronts the village provided an avenue of safe passage and convenient berthing for large foreign ships. To keep a better eye on the growing foreign interests, Kamehameha the Great moved his court to Kou in 1809.

Kamehameha the Great cultivated his own *lo‘i* in the lower valley to set an example for his people. The *lo‘i* and associated farmhouses are described by I‘i:

The places Kamehameha farmed and the houses he lived in at those farms were show places. His farmhouses in Nuuanu stood several hundred fathoms away from the right side of Kapaehala, a knoll on the western side of Nuuanu Street and Hanaiakamalama House [known today as Queen Emma’s Summer Palace]. Perhaps the location was chosen to enable him to look both inland and seaward to his food patches. Some elevated houses seem to have been for that purpose (I‘i 1963:69).

Kamehameha’s sacred wife Keōpūolani is thought to have owned a Nu‘uanu *lo‘i* that supplied the fodder for a royal sow (Handy 1940:79). Another Nu‘uanu *lo‘i* provided the red taro, *pi‘iali‘i*, that fed the Royal Court during the time of Kamehameha the Great (Sterling and Summers 1978:300). Upon the death of Kamehameha, the *lo‘i* he cultivated were taken over by Boki, a lesser *ali‘i* who later became the governor of O‘ahu. Boki noted the occurrence of several sacred stones in the area, one of which a *kahuna* advised him to keep in place because it covered an important water supply. Despite the warning, Boki tried to remove the rock, but did not succeed because it was deeply embedded.

Another portion of Kamehameha’s *lo‘i* fell into the hands of Abner Paki, father of Princess Bernice Pauahi Bishop, and he established an extensive *‘auwai* system that brought water from the uplands to the lower taro plots. In years to come, the valley of Nu‘uanu would serve as a retreat for the *ali‘i* residing at Kou/Honolulu. Nu‘uanu was not far from Honolulu, and the cool, wet climate provided a pleasant contrast to the hot and dusty city.

Ali'i residence in Nu'uaniu is first documented in the mid-1800s with the construction of Kaniakapupu, State site 50-80-14-409, the summer home of Kauikeaouli, or Kamehameha III. In keeping with the traditional practice of keeping multiple residences, this was one of many estates kept by the king. Kaniakapupu, however, was his main retreat home when he resided in Honolulu. The house was built in the early to mid-1840s, and the estate was named Kaniakapupu, or the singing of land snails. It has been suggested that the house was built on the site of *heiau*, but the archaeological and historic data cannot confirm this (Dixon et al. 1994:20). The main structure is a square single-story building made of cut coral blocks and uncut basalt stones set in mortar. A smaller square structure on the *'ewa* side of the main building has been interpreted as a cooking house (S. Lebo, personal communication 2004). A number of associated features include walkways, walls, *'auwai*, and pits. The site is most famous for its huge Restoration Day feasts in 1843 and 1847. More than 10,000 guests attended the celebration of 1847.

No references to Kaniakapupu are made after 1847, although a drawing of the structure was made in 1852. The house apparently fell into disuse upon the death of Kauikeaouli in 1854, and by 1874, the site was referred to as the "old ruins" (Lyons 1874).

Hānaiakamalama, State site 50-80-14-9904, was the summer estate of Queen Emma, wife of Kamehameha IV. The house was constructed in the late 1840s and later bought by John Young II, son of Kamehameha the Great's advisor, and uncle of Queen Emma. The name of the estate translates as "foster child of the light (or moon)" (Pukui et al. 1974). It was also the name of another home of John Young II in Kawaihae, Hawai'i Island (Thrum in Sterling and Summers 1978:301). The property was inherited by Queen Emma and used as a retreat and social gathering place. One notable party that took place at Hānaiakamalama was the lavish banquet for the Duke of Edinburgh, son of Queen Victoria, during his visit to Hawai'i in 1869. Queen Emma also owned *lo'i* in Nu'uaniu in the vicinity of Hānaiakamalama. The estate was sold to the Hawaiian government in 1890 and made a public park in 1911. The house was renovated in 1915 and is now cared for by the Daughter's of Hawai'i, who have opened it to the public as a museum.

2.2.4 Previous Archaeology

Because of the development of the Honolulu metropolis, archeological work has been extensive in Nu'uaniu Ahupua'a (Table 1) Only work carried out in the vicinity of the project area will be summarized here. Archaeological reconnaissance (Neller 1984; Hammatt 1988), an architectural description (Spenser Mason Architects 1989), an historical background study (Anderson and Williams 1993), and archaeological inventory surveys (Dixon et al. 1994; Moore and Kennedy 1999; McElroy 2005) have been conducted at Kaniakapupu and its surrounding area, which are *mauka* of the current project site. University of Hawai'i archaeological field schools were conducted at Kaniakapupu by Susan Lebo and James Bayman in 1999 and 2000 but the results of these investigations have yet to be published.

Neller published the findings during field trips to Kaniakapupu with children participating in a Bishop Museum summer program and with University of Hawai'i anthropology students. He described the ruins of the main structure and the thick surrounding vegetation. His goal was to make recommendations for preservation and management of the site and he noted that it could be nominated to the National Register of Historic Places because of its association with Kauikeaouli.

An archaeological reconnaissance was conducted on two residential properties adjacent to the Kaniakapupu estate (Hammatt 1988). Two terraces, a short stone alignment, and scattered historic artifacts were recovered. All are thought to be associated with Nineteenth or Twentieth Century use

of the area. Nine test units were excavated at the artifact scatter, and no subsurface cultural remains were found. None of the structures were evaluated as eligible for the listing on the Hawai'i Register of Historic Places.

An archaeological inventory survey of one parcel adjacent to the Kaniakapupu estate identified one site designated 50-80-14-4928 (Dixon et al. 1994). The site consists of 20 features that are associated with both Nineteenth and Twentieth Century use of the area. All cultural features were mapped, and 12 test units were excavated. A radiocarbon date with the calibrated age of AD 1428–1955 was obtained from the base of a stone wall, but none of the features are thought to date to pre-Contact times.

An archaeological inventory survey was conducted in response to the Board of Water Supply's Nu'uaniu Pali Pipeline Project (Moore and Kennedy 1999). Two significant archaeological sites were documented. Site 50-80-14-5696 is a dry-laid stone wall, and site 50-80-14-5697 is a corroded water pipe and associated stone and earthen berm. The wall, site 50-80-14-5696, is thought to be associated with Kaniakapupu, and may have functioned to demarcate the property boundary. Site 50-80-14-5697, the water pipe and berm, are thought to have been constructed in the 1930s. This site was considered sufficiently documented and therefore no longer significant.

An archaeological inventory survey was completed for a Board of Water Supply contractor's storage area and vehicle turnaround near the north end of Nu'uaniu Pali Drive (McElroy 2005). Site 50-80-14-5697, the water pipe and berm identified by Moore and Kennedy (1999), extended into the project area, and a possible habitation terrace (site 50-80-14-6675) was identified. Further testing was recommended for the terrace.

2.2.7 Summary of Background Information

The historical information and previous archaeological work presented above help in predicting the kinds and distribution of archaeological remains in the project area. Historical accounts describe Nu'uaniu as an agricultural area (Handy 1940; Handy and Handy 1972), so agricultural terraces and *'auwai* are likely to be the dominant traditional structures present. Nu'uaniu is noted for a number of important *heiau* (Beckwith 1970; McAllister 1933), so it is possible that the remains of religious structures may occur in the vicinity of the project area.

Nu'uaniu Ahupua'a was the site of a number of significant battles in the early historic period (Fornander 1919; Kamakau 1912). It is possible that the vestiges of war such as human remains, fortifications and weapons remain in the area, but this is unlikely. It is often difficult to distinguish structures associated with warfare from those of everyday life (Dye and Maly 2003; Kirch 1990).

The historic period also saw the construction of *ali'i* residences in Nu'uaniu. The project area lies between Kaniakapupu, the summer palace of King Kamehameha III, and Hānaiakamalama, Queen Emma's summer palace, although it is unlikely that remains associated with either estate may be found in the vicinity.

Previous archaeology near the project area has documented a number of historic features and structures *mauka* of the project site. At least one dry-laid stone wall is thought to be associated with Kaniakapupu (Moore and Kennedy 1999). None of the structures or features described in the archaeological reports are thought to be pre-Contact in age (Hammatt 1988; Dixon et al. 1994; Moore and Kennedy 1999), except the possible habitation terrace (McElroy 2005).

Table 1. Previous Archaeology in Nu‘uanu Ahupua‘a

Reference	Project Type	Location
McAllister (1933)	Survey	Nu‘uanu Valley
Seelye (1968)	Excavation	‘Iolani Palace
Gould (1970)	Excavation	Hānaiakamalama
Rosendahl (1971)	Excavation	‘Iolani Palace
Fairfax (1973)	Excavation	‘Iolani Palace
Spilker (1974)	Excavation	‘Iolani Palace
Luscomb and Reeve (1976)	Excavation	‘Iolani Palace
Sinto (1977)	Excavation	‘Iolani Barracks
Sterling and Summers (1978)	Survey	Nu‘uanu Valley
Ota (1980)	Monitoring	Royal Mausoleum
Tomonari-Tuggle (1983)	Assessment	Block J, Downtown Honolulu
Yent (1983)	Reconnaissance	TMK:2-2-22:02
Kennedy (1984)	Excavation	TMK 2-1-02:38,39
Neller (1984)	Reconnaissance	Kaniakapupu
Silva (1984)	Architectural	Royal Mausoleum
Yent (1985)	Monitoring	Royal Mausoleum
Athens (1986)	Monitoring	Judiciary Parking Garage
Clark (1987)	Monitoring	Makai Parking Garage
Hammatt (1988)	Reconnaissance	TMK 2-2-55:02,04
Charvet-Pond and Pantaleo (1989)	Monitoring	Chinatown Gateway Plaza
Hammatt and Borthwick (1989)	Assessment	Richards, Alakea and Hotel Street
Leidemann (1989)	Reconnaissance	TMK 2-2-31:11,12,31

Table 1. Previous Archaeology in Nu‘uanu Ahupua‘a (continued)

Reference	Project Type	Location
Spencer Mason Architects (1989)	Architectural	Kaniakapupu
Hurst (1990)	Historical	Ka‘ahumanu
Smith (1990)	Excavation	Queen Emma’s Summer Palace
Smith and Rosendahl (1990)	Historical	Aloha Tower
Chiogioji et al. (1991)	Monitoring	Hawaii State Public Library
Hurst and Cleghorn (1991)	Historical	Kekaulike
Leidemann (1991)	Survey	TMK 2-2-32:11
Simons (1991)	Monitoring	Armed Forces YMCA
Hurst and Allen (1992)	Survey	Ka‘ahumanu Parking Structure, Harbor Court
Anderson and Williams (1993)	Historical	TMK 2-2-55:02,04
Avery and Kennedy (1993)	Monitoring	South Street Building Complex
Denham and Kennedy (1993)	Monitoring	State Capitol
Dunn and Rosendahl (1993)	Survey	Nu‘uanu Court
Flood and Dixon (1993)	Excavation	TMK 2-2-31:32
Dixon et al. (1994)	Excavation	Near Kaniakapupu
Kennedy et al. (1994)	Survey and Excavation	Kekaulike
Klieger (1994)	Historical	800 Nu‘uanu
Lebo et al. (1994)	Excavation	Harbor Court
Carpenter and Yent (1995)	Monitoring	Washington Place
Goodwin et al. (1995)	Data Recovery	Marin Tower
Riley et al. (1995)	Survey and Excavation	Chinatown

Table 1. Previous Archaeology in Nu‘uanu Ahupua‘a (continued)

Reference	Project Type	Location
McGerty et al. (1995)	Assessment	Chinatown Community Service Center
Riley et al. (1995)	Data Recovery	Kekaulike
Goodwin et al. (1995)	Data Recovery	Marin Tower
Goodwin (1997)	Excavation	Kekaulike
Heidel and Hammatt (1997)	Excavation	TMK 1-7-03:14
Lebo (1997)	Excavation	Harbor Court
Hammatt and Chiogioji (1998)	Assessment	TMK 2-1-09-18,17
Klieger et al. (1998)	Survey	TMK 2-2-31-11-and 12
Moore and Kennedy (1999)	Survey	TMK 2-2-54:1
Perzinski et al. (2000)	Survey	Block J, Downtown Honolulu
Lebo and McGuirt (2000a)	Excavation	800 Nu‘uanu
Lebo and McGuirt (2000b)	Excavation	800 Nu‘uanu
Major and Carpenter (2000)	Monitoring	Washington Place
Elmore and Kennedy (2001)	Monitoring	TMK 1-7-02, 1-7-03, 2-1-02
McGerty and Spear (2001)	Historical	Foster Botanical Garden
Winieski and Hammatt (2001)	Monitoring	Nimitz Hwy.
Dye (2002)	Monitoring	Capitol District Building
Mann and Hammatt (2002)	Monitoring	King Street Rehabilitation Project
Dockall (2003)	Survey	Washington Place
Putzi and Dye (2004)	Monitoring	Ali‘iolani Hale
McElroy (2005)	Survey	TMK:2-2-054:001

3.0 ARCHAEOLOGICAL SURVEY

3.1 METHODS

Archaeological inventory survey was carried out on April 9, 2007 by Michael Desilets, MA. This consisted of a pedestrian survey of the drainage improvement's Area of Potential Effect (APE), which was a 2m-wide corridor running down slope from Nu'uaniu Pali Drive, terminating at the pipe out-flowing into Nu'uaniu Stream.

3.2 RESULTS

No surface archaeological remains were observed along the surveyed corridor. Inspection of the surrounding area and consultation with the landowner led to the discovery of a former *'auwai* running parallel with the stream and crossing (perpendicular to) the drainage corridor (Figures 3 and 4). The *'auwai* is known as Pahoa 'Auwai and is shown on historic maps (Kim and Shiroma Engineers 2003). This *'auwai* segment is part of a much larger system of *'auwai* which are well known and recorded (Kim and Shiroma Engineers 2003).

Pahoa 'Auwai begins at the *mauka* end of TMK:2-2-051:053, which is the parcel adjacent to the current project area on the north (Figure 5). The *'auwai* taps Nu'uaniu Stream and continues roughly southwest, with some portions flowing through underground tunnels. The *'auwai* continues through the project parcel and beyond, paralleling Nu'uaniu Stream and Nu'uaniu Pali Drive (Kim and Shiroma Engineers 2003). The *makai* end of Pahoa 'Auwai passes near Queen Emma's Summer Palace and ends at TMK:2-2-033:009, beyond La'imi Road, where it empties into Nu'uaniu Stream (Kim and Shiroma Engineers 2003).

Although the *'auwai* is maintained in its original state in some sections, the portion running through the project APE is highly modified, apparently by previous drainage improvements, and now runs through underground piping. Any traditional wetland fields that the *'auwai* might have irrigated are no longer visible on the surface in the project parcel. Subsurface wetland deposits, however, might be present along either side of the *'auwai*.

Planned improvement to this drainage line will impact the *'auwai*, although, due to previous modifications, the impact will not substantially alter the integrity of the *'auwai*, provided the *'auwai* retains its original flow following the completion of work. The current landowner, as well as local community members (particularly the *'auwai* study group) have demonstrated a high level of interest in maintaining functioning *'auwai* in Nu'uaniu Valley (see Section 4.0).



Figure 3. Proposed drain line and alignment of modified (subsurface) *'auwai*. View to northwest and Nu‘uanu Pali Drive.



Figure 4. Proposed drain route and *'auwai*. Note that *'auwai* drains into an underground pipe and extends for some 8 m in this manner. View to southwest.

4.0 ETHNOGRAPHIC SURVEY

By Maria Orr

4.1 INTRODUCTION

At the request of Garcia and Associates, an ethnographic survey was conducted for the Nu‘uanu Storm Drainage Project. This Ethnographic Survey is part of the Cultural Impact Study/Assessment conducted in accordance with the State of Hawai‘i Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts [1997] (Appendix B). This study is in compliance with Act 50 SLH 2000 (HB 28 H.D.1) (Appendix C) as it amends the State of Hawai‘i Environmental Impact Statement law [Chapter 343, HRS] to include “effects on the cultural practices of the community and State. [It] also amends the definition of ‘significant effect’ to include adverse effects on cultural practices.”

The purpose of this ethnographic survey was to gather information about traditional cultural practices, ethnic cultural practices and pre-historic and historic cultural resources that may be affected by the implementation of the storm drainage project. The level of effort of this ethnographic survey (oral histories) is interviews of three people who live on the project site, or along the same ‘auwai.

4.2 METHODS

The Ethnographic Survey was conducted between the months of April to May 2007. The survey consisted of three phases: (1) ethnographic survey (oral history interviews) and transcribing taped interviews (GANDA); (2) analysis of ethnographic data (oral histories) and (3) report writing.

4.2.1 Personnel

The personnel consisted of the ethnographic investigator, Maria Orr, who has a master’s degree in Anthropology, with a graduate curriculum background in the archaeology track as well as anthropology theory, cultural resource management, ethnographic research methods, and public archaeology; an undergraduate curriculum background that included Hawaiian History, Hawaiian Language, Hawaiian Archaeology, Pacific Islands Religion, Pacific Islands Archaeology, Cultural Anthropology, as well as a core archaeology track, Geology, and Tropical Plant Botany; and ethnographic field experience that includes over 200 interviews to date.

4.2.2 Level of Effort

The level of effort for this survey included three interviews of residents on and near the project site.

4.2.3 Theoretical Approach

This study is loosely based on *Grounded Theory*, a qualitative research approach in which “raw data” [transcripts and literature] are analyzed for concepts, categories and propositions. Since this was a semi-focused study, categories were pre-selected as part of the overall research design. However, it is not always the case that these research categories are supported in the data. Categories were generated by forming general groupings such as “Land Resources and Use,” “Water Resources and Use” and “Cultural Resources and Use.” Conceptual labels or codes are generated by topic indicators (i.e., agriculture, ‘auwai, fishing). In the *Grounded Theory* approach, theories about the social process are developed from the data analysis and interpretation process (Haig 1995; Pandit 1996). This step was not part of this survey as the research sample was too small.

4.2.4 Consultant Selection

The selection of consultants are usually based on the following criteria:

- Had/has Ties to Project Location(s)
- Known Hawaiian Cultural Resource Person
- Known Hawaiian Traditional Practitioner
- Referred By Other Cultural Resource People

The selection process for this survey was only based on “ties to project location.”

4.2.5 Interview Process

A typical interview process includes a brief verbal overview of the study. Then the consultant is provided with a consent or ‘agreement to participate’ form to review, which was drafted for the edification and protection of each consultant (Appendix D). An ethnographic research instrument (Appendix E) was designed to facilitate the interview; a semi-structured and open-ended method of questioning based on the person’s response (‘talk-story’ style). Each interview was conducted at the convenience (date, place and time) of each consultant. The interviews were conducted using a Radio Shack cassette tape recorder; each interview was conducted at the homes of the consultants. Notes were also taken, but more attention was given to listening intently to each consultant. A *makana*, or gift, was given to each consultant in keeping with traditional reciprocal protocol.

4.2.6 Transcribing-Editing Process

The taped interviews were transcribed by staff of GANDA and edited by the ethnographic investigator. Each consultant was sent a *mahalo* letter that explained the transcript review process, along with two hard copies of the interview transcripts, two ‘release of information’ forms, and a self-addressed, stamped envelope for return of one signed release form and one copy of the edited transcript. This process allows for corrections (i.e., spelling of names, places), as well as a chance to delete any part of the information if so desired or to make any stipulations if desired. Each consultant was also informed of the two-week time limit for their review after which it will be assumed that the raw data can be selectively used. Upon the return of the revised transcripts, the ethnographic investigator corrected the transcripts to reflect consultant revisions.

4.2.7 Ethnographic Analysis Process

The analysis process followed a more traditional method, as a qualitative analysis software program was not necessary. The interview was manually coded for research thematic indicators or categories (i.e., personal information; land, water and cultural resources and uses; site information - traditional and/or historical). For the purpose of this study, it was also not necessary to go beyond the first level of content and thematic analysis, as this was a more focused study. However, sub-themes or sub-categories were developed from the content or threads of each interview (e.g., ‘*auwai*, Nu‘uanu Stream).

4.2.8 Research Problems

Research problems usually involve time constraints, for both researcher and consultants:

- Two consultants were on extended vacations and were not able to return revisions for several weeks.

4.3 ETHNOGRAPHIC SURVEY (ORAL HISTORY INTERVIEWS) AND ANALYSIS

The Ethnographic Survey (oral history interviews) is an essential part of a Cultural Impact Study and Assessment (CIS/A) because they help in the process of determining if an undertaking will have an adverse impact on the cultural resources and practices or access to cultural resources and places of cultural practices. The consultants for this CIS/A were selected because they met the following criteria: (1) consultant grew up or lives at or near the project area; and/or (2) consultant is familiar with the history and *mo'olelo* of Nu'uaniu. Copies of signed "Consent" and "Release" forms are provided in Appendix F and Appendix G.

4.3.1 Research Themes or Categories

To comply with the scope of work (Appendix H) for this CIS/A, the ethnographic survey was designed so that information from ethnographic consultants interviewed would facilitate in determining if any cultural resources/sites or practices or access to them would be impacted by the implementation of the storm drainage project. To this end the following basic research categories or themes were incorporated into the ethnographic instrument: Consultant Background, Land Resources and Use, Water Resources and Use, Cultural Resources and Use, Anecdotal Stories, and Project Concerns. Except for the 'Consultant Background' category, all the other research categories have sub-categories or sub-themes that were developed based on the ethnographic raw data (oral histories) or responses of the consultants. These responses or clusters of information then become supporting evidence for any determinations made regarding impacts on cultural resources and/or practices.

4.3.2 Consultant Background and Demographics

Each consultant was asked to talk about their background; where they were born and raised, where they went to school and worked, and a little about their parents and grandparents. This category helps to establish the consultant's connection to the project area, their area and extent of expertise, and how they acquired their proficiency. In other words, how the consultant met the consultant criteria. Three individuals were identified as consultants and interviewed; all three have ties to the project area, but only one lives at the project site. Only one consultant is Part-Hawaiian; the other two are Caucasian although one is married to a Part Hawaiian. The wife of one consultant joined her husband at one point.

There is always a danger of not allowing the consultant's "voice" to be heard; of making interpretations that are not theirs; and of asking leading questions. To remedy this, the "talk story" method is used and allows for a dialogue to take place, thereby allowing the consultant to talk about

Table 2. Consultant Demographics in Relation to Project Lands

Consultant	Ethnicity	Born/Raised	Years/Nu'uaniu	Ties to PL
Guy Lageman*	Caucasian	Green Bay, WI	7	X
Ben Sills	Pt Hawn/Cau	Nu'uaniu/Kapalama	9	X
Jeannine Sills	French-Canadian	—	9	X
Shannon Wilson	Caucasian	Washington, DC	17	X

*Married to a Part Hawaiian

a general topic in their own specific way, with their own specific words. All of the excerpts used are in the exact words of each consultant or paraphrased to insert words that are “understood” or to link sentences that were brought up as connected afterthoughts or related additions spoken elsewhere in the interview. The following excerpts in “Consultant Background” provide a summary of each consultant, as well as information about their parents and grandparents. They are presented below alphabetically.

4.3.1 Guy Lageman



My name is Guy Lageman. I was born in Green Bay, Wisconsin, I grew up in Wisconsin until my late teens, at which point I moved to Wyoming, spent four years in Wyoming, finished off high school, and worked in Wyoming, and then moved to Arizona and spent four years going to school in Flagstaff, Arizona. Moved to Hawai‘i for two years, that would be ‘88 to ‘90, and then lived in Denver, Colorado for all of the ‘90s, returning to Hawai‘i in 2000. And I’ve lived in Honolulu since my return in 2000. We had an opportunity to purchase the family business. It’s something that my wife, Malia, wanted to do, so we thought we’d give it a try. She is part-Hawaiian. She’s a descendant of King Kamehameha, but I could not tell you what the lineage it is on—something her father’s (Scott Charles

Ho‘olulu May) talked about several times. We live off Nu‘uanu Pali Drive. And we were looking for something we could afford in Honolulu that needed to be remodeled, since I’m a general contractor. And we just stumbled upon it, actually, a bank owned it and the person who lived in it had passed away and the home had structural failure. So they were not able to put it on the open market. They needed to sell it to a contractor. Our realtor heard about it, so we just took a look at it, made an offer that the bank accepted.

4.3.2 Ben Sills



My name is Ben Sills. I was born in Honolulu here, [Nu‘uanu below Craigsides, below Judd St...it’s not there anymore] back in ‘43. Grade school would be St. Anthony in Kalihi. High school was at Maryknoll and lived in the Upper Kapalama area and Skyline, outside Kam School’s back gate. I lived there all my life. After I got married, I moved to Pearl City for 30 years and then here in Nu‘uanu for the last nine. My parents are local, from here. My father was from the Wahiawa area and my mother was from Haleiwa and they both ended up in Kalihi. My father’s education was 9th grade, I believe. My mother was high school. My father Thomas Franklin Sills; he worked at Pearl Harbor until he retired. His mother, my

grandmother was half Hawaiian, half Chinese. Ah Lan Pang Yuck Kee is I believe her name. We have the genealogy going way back to ... supposed to be King Kamehameha’s family - everybody goes back to them. She grew up in Wahiawa, and then like I said, moved to Kalihi. And then her first husband, I believe, went back to China. Her Hawaiian family is Haae I believe. My mother’s name was Rose Teves Sills; she was a secretary [she is Portuguese and Japanese- her Japanese grandfather had come here and then jumped ship and never went back to Japan--he married a Portuguese lady right away]. But family ties, we go way back to old Hawaii. I work for Hawaiian Airlines—you name it, I did it--mostly ticket agent--started way back when. I worked for the airlines for 43 years; and odds and ends, here a job, there a job.

4.3.3 Jeannine Sills

[Jeannine Sills is French Canadian. She joined her husband late in the interview. She does a lot of research on the history of their property and Nu‘uanu. She shared some of her research and talked about the property and the floods.]



4.3.4 Shannon Heath Wilson

My name is Shannon Heath Wilson and I was born in Washington, DC, although I was here by the time I was one year old. My mother, who’s an island girl, married a naval officer, so we lived many different places--I grew up in many different places, although for three years we were back here. My dad was a commanding officer at Kāne‘ohe, which was then a naval station, and I went to Punahou for three years and then I went back to California because my dad was transferred. I went to school at Stanford and later I went to school at UCLA and even later than that I went to Sonoma State University But we always kept coming here, I have big family back here, so we always came back to visit. And in my second marriage I married someone who’s from Hawai‘i also, and so after some years we decided we’d move back home.



My mom is Flora Walker Heath; she was born on the corner of King and Pi‘ikoi street, their house was there. She was the last of eight children, seven of whom survived and lived to be adults. Her father was John Walker, he was a building contractor, he built a lot of buildings you see around Hawai‘i, like City Hall, Territorial Building, the C. Brewer Building, in Kāne‘ohe the insane asylum, all kinds of things. Her mother was Sophie Klussman Walker. Both of her parents emigrated here. My grandfather emigrated here to go to the Hāmākua Coast because his uncle William Walker ran the Olaa Sugar Plantation and asked for him to come from Aberdeen, Scotland, so he came over here from Aberdeen, Scotland in 1876. And my grandmother who was somewhat younger than he, came from Germany when she was 13, that was 1880–something... And they met here and married here.

After my father retired they came back to Hawai‘i; that was in the ‘50s and they lived at Lanikai for several years. I think they probably bought this house in ‘58 maybe ‘59. After my father died and then my mother—they died fairly young. My father died in ‘65 and my mother in ‘71. My sister and I owned this for a while and we rented it because we were both living on the mainland, and I bought her half out and I would come back, sometimes staying here, sometimes staying with cousins, sometimes just traveling around. And we moved back here permanently in 1989. The lady who lived in this house died and then one property was bought by someone who divided it into three lots.... This whole place here was subdivided by Mr. Dowsett...in the 1920s, and this particular house actually pre-dates that, because the first part of this house was built about 1917. Then it was really made into more of a house in the ‘20s.

[After UCLA] I got married and had children. Then I went back to school in psychology and then I became a psychotherapist; I’m interested in Jungian therapy. I worked in a hospital for a while, doing the counseling, in the social services department, even though I wasn’t a social worker. Then I went to private practice. I’m retired now. I’m a member of the Daughters of

Hawaii. When I moved back here one of my cousins and I joined the Daughters and before I knew it we were on the Board doing something, started doing “arrangements.” Some years later I became the regent, the head person, and I did that for two years, everybody does that for two years usually; now I’m the historian on the board. Our historical files are about the history of the Daughters, the history of Queen Emma’s Summer Palace, and Hulihe‘e Palace... My [second] husband, Mike, is from O‘ahu, but his family was spending some months in Hilo when he was born. In those days his father ran a smallish company, and in those days when your employee took a vacation, it was for some few months, so you would go over, move your family over to take that person’s place. So they were in Hilo when he was born, but they came back here.

4.4 LAND RESOURCES AND USE

Land resources and use changes over time. Evidence of these changes is often documented in archival records. Cultural remains are also often evident on the landscape and/or beneath the surface and provide information regarding land resources and use. However, oral histories can give personal glimpses of how the land was utilized over time and where the resources are or may have been. Oral histories can also provide confirmation of cultural practices.

Much of the project lands have been continuously utilized for a range of uses; from traditional farm lands (*lo‘i kalo*), to cattle grazing, to urban settlement. Only one consultant spent his very early years in the vicinity; and all three did not grow up in the project area. However, one consultant now lives on the project lands and the other two in the vicinity. They all reside on properties that the Paho‘a ‘Auwai and Nu‘uanu Stream run through (Figure 6).

4.4.1 Project Property



It was a big estate before it was divided. It was Coke who owned it—Judge Coke. I’ve gone on the web many times but can’t find anything. And when we first moved here the neighbor told us that they had featured this particular house in [? magazine] or something, when it was a wooden house, and then when they remodeled it. They featured it in one of those Hawaiian magazines, Pacific something. So I went to the library—I spent hours going through piles of their magazines, from ‘78 to now, looking for something that might be...because I’d like to have the history of the property and the house. So it’s not old—‘78, before that there were no homes [J. Sills].

Like I said, I’ve been here 9 years, the first year I started making bridges. When we first came our backyard was just overgrown. It took us 3 months to clean it, every day mulching and cleaning. The property goes back to that pin back there, you see that orange pin? That’s where the property goes [B. Sills].

Figure 6. The Sills property; back yard.

The property goes from the other side of these palm trees into the middle of the river, comes down to where this rock is, just about, and shoots up to that stone wall, and down (Figure 7). Okay, this is our property map. So it comes down along the palm trees, cuts into the river, goes up to the stone wall, cuts to this pipe way in the back here, by the coconut tree, you see where the white post is? It's in line with that. And then it comes back across the river, so it shows the 'auwai too [B. Sills].



Figure 7. Stone wall property boundary.

I made the walls because it was just dirt. But they did have this family in here used to be the Coke family. And they owned from here up to that street and all the way to the water shelter and they subdivided and the last two properties were that one and this one that she had. And then they divided these two. So this was only built in '78 or something like that. And this used to be I guess her fishpond, and they have a row of cement on the bottom where it used to line, and like I say, it was just like a hillside, so I wanted to make it more usable, so we can walk, instead of walking downhill, so I put this wall on top. But it went all the way down there. That side there is still natural dirt and it's real soggy if you're walking on it. It's all soggy and then it goes to the bridge, and then it goes across to a pipe and it goes into the neighbors [B. Sills].

And you can see a natural water flow down there, that pond (Figure 8). So water is coming down and if you were to walk in here, this was just a mud bog. So I just planted bananas and impatient. This was all a mud bog. I put rocks up, all in here. About 6 inches, 6–8 inches of rock in here, just so that we could walk in here. When the rains come down they move these rocks down [B.Sills].



Figure 8. Sills 'auwai and pond.

4.4.2 Nu'uanu: Project Area and Vicinity Flora



Figure 9. Kukui in Sills back yard.

Kukui was here (Figure 9). This place is loaded with *kukui*. I didn't take any *kukui* out. I left them all in, except for the *keiki*, the seeds that fell, but all the other ones stayed here. If I took this one out, I could have moved this over another 6 feet [gazebo], but I just left it. There's plenty on that side. Where this tree is, we used to have a *kukui*, and it must have been about 5 feet taller than that one there and we had a storm...the neighbors have *kukui* now [B. Sills].

We've got avocado and we've got star fruit right there; it gives us 4 or 500 star fruits a year. And bananas, everywhere there's banana trees, because they keep making *keikis*; we always have bananas and guavas. Somebody did a good job of planting the right things; really nice [J. Sills].

That's *'ape* (Figure 10). You can look at the other one if you know your taro. But I know at one time they had some taro in there and the yard men, the lady who used to live next door, she told them "take that all out" and they dug up, I think the taro must have been 2 foot long. There's a lot of *keiki* over there too. So I was gonna get some *keiki* to put in my pond (Figure 11). I put it in pots and put it in the water [B. Sills].



Figure 10. 'Ape and taro in back yard.



Figure 11. Taro in Sills part of Nu'uuanu Stream

I don't know if he was the one that caused it all to happen, because there were some other lesser *ali'i* involved perhaps Boki, I think he was involved. He was the person that got the idea started that this could be a wonderful breadbasket for O'ahu for food. As you know, this was not a jungley place in those days, if you see the early pictures of Nu'uuanu, its grassy mountains and fields [Wilson].

Well there's Saint Augustine grass here that the neighbor planted and that ran over our property. Because this used to be all overgrown when we bought it and then we cut it back and I tried to get Mondo grass growing and I stuck little Mondo plugs everywhere and the other grass ran right over the top of it. Saint Augustine is what the neighbor called it. We didn't have any true trees, we just had rubber tree; we have the Magnolia...then we planted the papaya, and we have some bananas - we're always trying to work on the bananas. I kept every banana tree that we had, but they're very slow producers. We have a neighbor that's lived here for 50 years, and she said they are Bearfield type. They're large, they're tasty, but very slow; maybe because they don't get enough sun behind this big palm clump. And then the giant fern that we have, those all came from the Big Island. I guess our neighbor, decades ago, they brought them over and transplanted a few of them over into our yard. There's a banyan right here to the left, and then I don't know what those are...but they're getting old. We've had a couple fall since we moved here. And then we cut, in conjunction with our neighbor, we had a tree trimmer come in and cut all the trees right along the fence line in the back because the neighbors were worried the trees were going to fall on their houses. They're just getting that old. Whatever that one is, it's going to come down sooner or later [Lageman].

4.4.3 Pahoā ‘Auwai Taro, or *Kalo*



Figure 12. Taro struggling through Impatiens.

They’re just growing on their own and they’re just wild at the moment (Figure 12). I would like to put a taro patch in here when I’m done with the construction. We’ve got a perfect spot, actually right over here, it’s flat. But that’s just something I’m waiting on. But I’d like to get a little taro patch growing. One problem a lot of the homeowners have is they don’t have a flat spot near their ‘auwai in this part of the valley. It’s all slope for the first, say, I’m the 6th house, and I’m the first house that has a flat spot next to the ‘auwai. All the rest it’s a drop-off. So they would be hard-pressed to put any kind of a pond in [Lageman].

I know Mike and Sharon have been trying to have a *lo‘i* installed in the Queen Emma Summer Palace grounds but that area is, they’ve been trying to get it done in the park because that’s where it made sense (Figure 13). The City doesn’t really want it because there’s a liability issue. So it hasn’t really gone anywhere. It comes down to if you do it then you have to fence it off. I don’t think it’s going to...well I can’t say if it’s going to happen or not, but I think the best way for *lo‘i* to be re-introduced is really going to be on private property—someone who is willing to assume the risk. Which it is, it will wind up being an attractive nuisance, someone gets hurt on your property you’re always liable. It’s one of the hazards of the modern legal system. There are more koi ponds than *lo‘i* by far [Lageman].



Figure 13. ‘Auwai runs through pipeline; former *lo‘i* kalo now City park.

4.4.4 Nu‘uanu Cattle

I think it used to be part of the estate for Eastman [Kodak]. They owned I guess a fair amount of the valley at one time. And they had cattle. Supposedly, according to the folks next door, they had seen photos where this was all clear cut, there weren’t any trees and they had cattle up here. But he could be mistaken, too. He never saw it in print, he saw just a photo and he assumed it was this area [Lageman].

4.5 WATER RESOURCES AND USE

The Hawaiian word for fresh water is *wai*; the Hawaiian word for wealth is *wai wai*. This is because of the value the ancient Hawaiians placed on fresh water, which was crucial for growing taro, the staple of the Hawaiian people. Fresh water was also crucial in the lifecycle of native stream inhabitants such as the ‘*o‘opu* and ‘*opae*, as well as some of the marine life that depended on the benefits of brackish water areas.

4.5.1 Nu‘uanu Stream/‘Auwai History

Later other people lived here, Queen Emma naturally, but before Queen Emma, I guess, that whole system of the Hawaiians was very conscious of the relationship between land and people in the way they did things (Figure 14). It was decided that they would increase the water flow to water the taro, so they would take the water off Nu‘uanu Stream, run down man-made ditches and it would go back on to the Nu‘uanu Stream and so all these things that you see, all the ‘*auwai* that you see, come off the Nu‘uanu Stream, and I think there are probably a few exceptions—one that’s on the other side, a couple that go down lower, but these main ones, come off the Nu‘uanu Stream, and they go into the Nu‘uanu Stream below (Figure 15) [Wilson].



Figure 14. Queen Emma Summer Palace.



Figure 15. Pahoa ‘Auwai leading to headwaters (right and middle), Nu‘uanu Stream headwaters (left).

The stream comes from the falls up here. It comes off the falls and it comes along and there are different ‘*auwai*. I did have a map of the different ‘*auwai*—let me get you a map of that [B.Sills].

How they [‘*auwai*] were built is that there were hundreds of men, Hawaiians, and they would start at the bottom and they go all the way up, and when they got to the top, they connected to the stream.... They had the ceremony, and opened it up for the water to go back down. And then they had quite a highly codified way of handling everything—certain kinds of practices were done above, washing yourself was done at the bottom, because it didn’t have to be too clean of water for that, but the drinking water was the first, and then water for certain things, and then also there was a very systematic way of letting people use the water on certain days for certain reasons, and that was very well-regulated by the *luna*, as they called him, the *luna wai*, the *luna* of the water. And if you didn’t do your share to maintain your section or to use the right amount of water, you were punished and if you did anything to really interfere with the ‘*auwai*, you were killed by getting your head stuck into the headwaters where the ‘*auwai* comes off into the stream. So they were very fierce about it, but they managed to water lots and lots of taro and that went on for a really long time [Wilson].



Figure 16. Pahoehoe 'auwai from Sills' neighbor (right); Sills' underground portion (middle); Sills' open section (left).

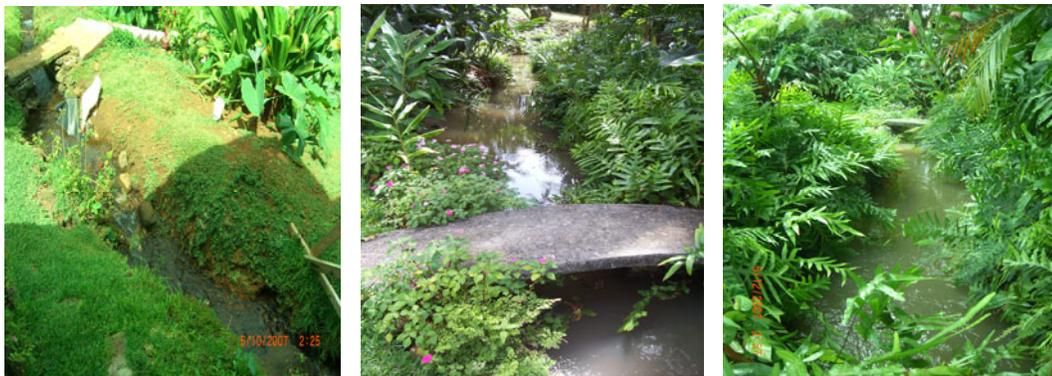


Figure 17. Lageman's and two views of Wilson's section of Pahoehoe 'auwai.

I think there are 14 'auwai...but at least two of them, one is completely shut down, meaning that people who built houses, I'm going to guess 20 years ago, they just filled it in, so everyone downstream, they were all cut off. That's one I'm aware of that I've seen, and then there's a second one which...a person upstream from___ actually cemented his in. And he grew up in the house, and inherited it from his parents who passed away—he said he didn't want the maintenance or the risk, the liability, and he had it filled with cement.... At least eight—that's the number that we came up with a few years ago [are still flowing] [Lageman].

This is the Pahoehoe Li'ili'i, which I believe translates to "Little Pahoehoe." I think *li'ili'i* is little, isn't it? It's probably not many miles. I can tell you how many houses are on it. This one drops back into Nu'uano Stream, roughly 10 lots past Nu'uano Elementary School. So mileage-wise, it would only be maybe a mile-and-a-half, maybe. [Looking at a file on the computer] So this has 50 properties on it as of 1953. That's the most current map of the 'auwai system. So I'm sure a few properties have been subdivided, put an extra house on there [Lageman].

Well I think there are 14 'auwai but some of them are completely dammed up and some of them are just partially running and some of them are good. They're in all different states of repair [Wilson].

4.5.2 Board of Water Supply and Nu'uano 'Auwai

In the old fashioned days, when Board of Water Supply managed the system, you'd be sitting here on your lanai, and all these guys would come walking up the 'auwai in their big boots and they would be sure it would be all cleaned out and cleared out and they just took wonderful care of it. Then they said to my father, "I think that's taking too much water off." So my father filled

in the pond, so now we don't have a pond. I suppose I could put it back now.... They had *lo'i* [a long time ago]; maybe things changed and they had other crops as well. In 1978 a new person came—director, or whatever they call the head of the Board of Water Supply, whatever the title is, and he said “We do not care for water for landscape. If it's not going to be for drinking water or for agricultural purposes, we're not going to do it. We're not for purposes of beauty.” So they abandoned the system just like that, and of course, nobody had any history of taking care of it because the Board of Water Supply had taken care of it. It's created kind of a problem [Wilson].

The Board of Water Supply used to maintain *'auwai* maintenance and they ceased that activity in the late '70s. So it became up to the landowners to maintain the *'auwai* and that doesn't happen with regularity [Lageman].

4.5.3 Nu'uau Valley 'Auwai Association

Well, that's just a little baby grassroots story. At first there was Mike, myself and my neighbor across the street and our friend, who is no longer alive—a young man who died of melanoma. The four of us got together and we thought we'd have a little meeting to see if we couldn't raise some people's awareness of keeping the *'auwai* clean and keeping it flowing. We met and nobody else met with us; we just sort of made an outline of important points and planned another meeting. Lee (Summers) Wild and I went to a visions meeting because [they] were speaking about giving someone a lot of money to build a huge building on that Nu'uau Valley Park and we didn't think that was a really good idea. It was going to be such a big building, and with the footprint of the building plus the parking you have to have, there was going to be no park left. We thought that doesn't seem to be a good idea, so we went down to say we were not in favor of that and we found out that \$50,000 had been awarded to _____ to do a study of the *'auwai* systems, and it didn't have a [community co-sponsor]. They used to have a name for the person, the community member, who kind of co-sponsored the certain project. Anyhow, the person who started the project wasn't interested any longer, so I said, “Well, we'll do it, we have a little group and we'll be the community sponsor.” And so we did do that and then the next thing that happened to us, a group of graduate students at UH asked if they could come and be part of our project, and wanted to study conflict resolution. How you might if you're having a little difficulty with your neighbor or somebody up or down the road about the *'auwai*, how you might resolve that and what the water rights parts were. And so by then we had a pretty big group of people who were interested and we developed brochures and we passed it out, and we started having meetings every month. We have about maybe 35 or 40 people on our mailing list and we have 6 to 8 people who come to any given meeting, sometimes 10. We try to educate people, we try to help them solve problems; we try to let new residents know about the [*'auwai*] system. Realtors have a brochure to give out to anyone that has an *'auwai*, because new people come in, they don't really understand, although it's in everybody's deed to let the water flow through. We offer to help people and there are some more or less public parts of it that we just go down and clean out ourselves. Tom Lalakea who lives up on Dowsett, has been very active in the *'auwai* system for years and years, many more years than I've even been back here. He's on our mailing list--he comes to an occasional meeting. He and his wife go up, way up to—they're on a different *'auwai* than I am—but they go way up and they keep it cleaned out all the time; so just a lot of community participation. And of course then there's some people who don't really seem to care, and you can't do too much about that. But the other people in the community have been caring for the *'auwai* in little spots and pieces for many, many more years than that. We're not the first effort that anyone has made. We're the first maybe more organized effort. It must have been the very beginning of 2003 or else the end of 2002 because this [brochure] was only published in October 2003 and we helped do this with them all the way along. Every time they'd have another version, we'd all look at it and make corrections. So this is what it is, it's really pretty neat. It's one of the visioning projects that I thought was not expensive and had a lot of good effect. There's a map of every single lot along an *'auwai*, and in the back there is a list of all the names of the people who live along the *'auwai*, of course a lot of that's changed by now, its 4 or 5 years old [Wilson].

I'm describing three separate *'auwai*. Mike does the upper half of Paho. We did a whole big push up here. We had the survey by the college students, the interviews with people, and we handed our brochure out to every household, and then we kind of slowed down. We haven't gone down below to lower Nu'uanu because we don't know it this well and we haven't gotten connected to people down there [Wilson].

Nu'uanu Valley *'Auwai* study group - that group came out of the efforts of some people who lived downstream that were interested in keeping the *'auwai* flowing because the flow was not consistent.... I got involved just because I heard about it through my wife and they said they were looking for other neighbors to join this group that is trying to save the *'auwai*. Because of all the *'auwai* in the valley, they don't all flow anymore. Some are dry, and some of them permanently altered.... I don't know when they started. My involvement started in '03 but it's just a neighborhood grassroots group. We essentially information-share, try to communicate problems and solutions, and then we'll actually talk about who's going to go take care of this or who's going to go take care of that. And, we try to be a resource too for others in the neighborhood, with the ultimate goal being that all the people, residents that live on the *'auwai* would realize that their little piece is their responsibility and they need to do the right thing so they don't negatively impact not only themselves and their little piece of history that their caring for but also they're not affecting people downstream.... So we're just all volunteering our time working together. We meet once a month generating the brochure, found some people to donate their artistic talent or their company's print skills and we're using that to get the word out. And also Daughters of Hawai'i have been very helpful. They allow us to use their facility to meet every month and we're also able to use their phone number as a contact number for people. Nu'uanu Valley Association, NVA, they also allow us to put our schedule on their website, our meeting schedule [Lageman].

4.5.4 *'Auwai* Benefits

It certainly has property value reason to it, I mean, it's not hurting anyone's property value to have any kind of water going through your property (Figure 18). Generally, be it stream, be it *'auwai*, be it you make a pond, it's just, there are so many positives, you hate to see it go away [Lageman].

There are a lot of people that really treasure it [*'auwai*], it enhances their property values, and in some places where it's just so beautiful and so intrinsic [Wilson].



Figure 18. Sills' *'auwai*/fish pond.

4.5.5 *'Auwai*/Stream Fauna

This is muddy, right, so the water goes through, and it's soft. So this is a natural pond. Got clams in here you know. Those are clam shells—Hawai'i fresh water clams (Figure 19). I brought all the carp in—they eat better than me (see Figure 19). When you retire, you just sit on the swing and feed them, feed them, feed them. So they would be like my children overfed. No exercise. Close them off. There's turtles in here too [B. Sills].



Figure 19. Clam (right); Sills' carp (left).

At one time it would have [had 'o'opu], but you have all the fish that come and eat them all. Like those red devils and the big mouth bass, they're aggressive fish, so they ate up all the natural fish, 'o'opu and all that. You don't have 'opae because the ducks used to eat them all (Figure 20). And that red devil fish, they eat all the 'opae, and they attack the crayfish. Used to have a lot of crayfish before, but ducks used to be here. They had that helmet, the sucker fish. They have those in here...and catfish that come down from the reservoir [B. Sills].



Figure 20. Wild duck.

The other thing too is the crayfish really enjoy building little mud tunnels along the concrete, where the concrete meets the dirt. The water finds those little tunnels and eventually starts to leak out sides and turns into a problem.... But now we've had these wild ducks, they've been here for a couple of years, we don't even see crayfish anymore in the stream, which is good, cause the crayfish would tunnel and make leaks. I haven't seen them in a long time. When we were remodeling the house, the support for the breakfast nook was substandard and so we had to bring it up to code and so we had to dig down to 'auwai level and then go a foot below that to put in a concrete pad. And we were in a new spot, we were digging, digging, digging, we were in a new spot where the shovel went in and the water, probably five gallons of water came rushing out, like there was a chamber, and all these crayfish were flip-flopping around. And that's five feet from the 'auwai, so they had tunnels, they had a little community that far off, it was very interesting. But my nephews are bummed that the crayfish are gone 'cause they like to catch them. When the ducks arrived they ate all the crayfish. It's okay. They ate all the centipedes too. I haven't seen a centipede in quite a while. In this area I've never seen anything larger than a tadpole. But it's pretty shallow, my section. And then up above, I only saw a fish once in the six years I've been in there and it was a reasonable-size fish [Lageman].

4.5.6 'Auwai/Stream Laws/Legal System

There are [laws]...you're not allowed to [fill in/cement 'auwai].... Legally, what I've read in the deeds of other houses, I've been to Bureau of Conveyances, just to do a little bit of research and you're allowed to use the water for a water feature, koi pond, anything you want. But you're not allowed to take it out of the system. So if you want to have a pond, that's fine, but the overflow once your pond is full, it goes back into the system. So when people divert it back into the stream, just by cutting it off, they're actually in violation of law, state law, and according to the state representatives that came to our group several years ago, they said "Look, time and again, when water rights issues have gone into the State Supreme Court, Supreme Court has always ruled that water is owned by everyone. No one has the right to siphon it off for their own means unless they have a permit." So there are agricultural permits still on file for Nu'uuanu Valley, but no one is farming. So you're not allowed to draw the water off to water your lawn; you're not allowed to divert it, period. You can, again, use it as a feature, but you're not allowed to take it out of the system. So there are plenty of koi ponds. There aren't very many taro patches right now that I'm aware of, but there are a number of water features and there's one or two that I'm aware of that they divert back into the stream because they get too much flow for their water feature, but most people are pretty good about leaving it in the system [Lageman].

I would love to see a little bit of legislation, or just some enforcement, where someone would knock on a door, with some legal capacity and say here's a cease and desist for what you're doing. You know, leave the water in the system. Look at it, put fish in it, build a big concrete reflecting pool if you want to, but don't take the water out of the system. If those things would happen, the system would last a long, long time. Anyway, it's such a unique part of Hawaiian history [Lageman].

We were told by a state representative, I don't know his name... after he had listened to the group and been to a few meetings (my first meeting was his last meeting as a guest), he said "You know what you guys, there's no money in the budget for 'auwai enforcement so don't ever make it a legal issue. Don't go and sue someone and have them try and counter sue City and County or the State of whatever, because it's cheaper for the State to turn the system off." Which they can just go plug up where the source is and say that's it, it's closed. Because if it costs the State money and there's no money for it, that's what they'll do. So he said "Try to find a neighborhood solution to a neighborhood problem." And so as a group that's what we're doing. I think the EIS is one more step toward enough awareness to where it would take the few problem neighbors and turn them into at least not being problem neighbors anymore. Without legal action, without heavy handedness, just saying "Whoa, this is bigger than me" [Lageman].

Its individual, we were told, based on everyone's deed; that there is no one blanket statement. In court cases we were told the results were always the same the water's owned by the public and unless you have a permit to specifically use the water in a given fashion, you can't. Can look at it as it goes by, can't divert it. And then the rest is just per deed. And the deeds are literally--you know "Jane Dowsett is allowed to draw water for her farm at such and such an address." And it would be today that address is a house, it's not a farm. So that stuff is still sitting out there. I don't think it's been discussed or touched legally or otherwise, and until the late '70s, the Board of Water Supply would send a crew. They would just walk through your yard and clean out the, throw out the debris and do whatever repairs had to be done. They would just come in and do their thing. Today 'cause it's such a litigious society people don't want other people in their yard. They only allow me in the yard because in the beginning, when they're like "Hey, who are you?" I just said "I'm your neighbor. I live downstream." And so today they don't say anything because people are used to seeing me but I don't think they'd want anyone else in their yard [Lageman].

4.5.7 'Auwai/Stream Rules/Courtesy

For example, simple things – don't pollute it; don't throw detergents or anything toxic into it, which happens from time to time, you know, people will drop dry cement, oil, cleaning fluid. Of course it kills the koi and whatever else living downstream. We haven't had that happen too much lately but it still comes up [Lageman].

You don't take the water out permanently, so you don't get to use it for anything other than a water feature, and then the water goes back into the system. And of course, don't poison it, don't pollute it. It's a really simple thing, but very few people do it [Lageman].

4.5.8 'Auwai Maintenance

My understanding of the history of the 'auwai is that the farmers who used to use it back when they were growing taro or whatever crops, there was maintenance, you would always have to clean out foliage, debris. Water, being water, is always trying to find the path of least resistance, so it would break a bank, overflow, you would have to get in there with an 'ō'ō or some other tool and do repairs. And they lined the 'auwai with rocks and banana leaves and one other type of leaf, which I'm not sure of. They used two types of leaves apparently, they had good properties for water retention, coupled with rocks, to line the 'auwai.... We're currently in the process of trying to walk the whole system and drop off a brochure with every resident that's on the system, to talk to people, to make them aware. Our initial thrust was to get the three main 'auwai that are in the Dowsett area, keep those flowing, and we thought it would branch out from there. We were hoping we would have more community involvement. Unfortunately our group has not grown any in the last two years [Lageman].

For every one of these 'auwai here, these three that we mainly tend right now, the upper ones, we have what the Hawaiians called the *luna wai* for each one. We have the same thing—Mike's

for ours, Tom Lalakea, and John Finney [for theirs], and Craig China, and Guy Lageman, whom you met, is for that other one. So we try to carry out the same thing, taking care and offering assistance, and being the primary one responsible if something goes wrong with the *'auwai*—if something dries up or blocks up [Wilson].

The *'auwai* gets clogged any time Nu‘uanu Stream is elevated in a torrent; it pushes rocks into the feeder for this *'auwai*. The other *'auwai* are surface fed, so they may get more water, and it may not clog, but this particular *'auwai* is fed from an opening below the surface of the water, so it will just become clogged with rocks and debris and shut down. And you just jump in as soon as the water recedes on Nu‘uanu Stream and dig it out. But the *'auwai* has never raised, never gotten to be a high level [Lageman].

We’ve kept ours open as far as possible. We clean ours out all the time [Wilson].

On the practical side, I have a neighbor here, his whole mission is to turn the *'auwai* into a zero maintenance thing, so that when he’s old he doesn’t have to deal with it. But that involves lining it with concrete or pool liner or something, which I’m against because it will always need maintenance. That’s the nature of the waterway...they meander. If you turn it into a storm drain, okay then it’s a storm drain. Then it’s a concrete pipe and it’s no longer an *'auwai* and that only works if you do the whole thing. So if you take your little part and make it bullet proof and spend the money, okay, but upstream it’s still eroding and one day you’re gonna be a high spot and the water’s gonna find a different way out. You know, it will stop going through your area. I hope people don’t do that. And I’ve never read anything that said you’re not allowed to do that. You’re just not allowed to obstruct the water itself. But maybe what will come out of this eventually, what I would like to see is people say “You know what, this is a historical thing. No alterations” [Lageman].

Well the other thing too, if people have to put a culvert in they need to put in a large enough one. Now, this one is a 12-inch, one foot, and we haven’t had any problems. Upstream there are two 8-inches, two 8-inch pieces. Those are problems. A coconut has a hard time fitting through an 8-inch pipe. And debris gets caught. It’s just too small. It’s enough to handle the water flow, but when you add debris to the water, you just have a continual maintenance issue of cleaning out in front of that pipe. So if people are going to use a pipe it needs to be a substantial diameter so that debris clogging is not an issue. ‘Cause you’re right, it’s really troublesome when you have pipes that clog. Further down the street if you end up walking the *'auwai*, some of the people have put pipes underneath their driveway, a number of them actually, and some of them use really little pipe, like 4-inch pipe, 3-inch pipe, two of them side by side. That’s just a maintenance problem for them because so many leaves can just get caught at the entrance to a narrow pipe [Lageman].

4.5.9 *'Auwai* and Stream Storm/Flooding Issues

So in a big flood this is the only place that I gotta make sure is clean because a ball, a beach ball, will come over here, and plug there, and no water. So, with our group here, we have a phone tree, so that if somebody downstream doesn’t have water they’ll call on different *'auwai*, they’ll call me, and I’ll look out, and if I have water, then it’s somebody downstream from me. But if I don’t have water, then it’s upstream, and I’m at the beginning, so this is the first place I come. I’ve come here midnight, storming rain, to open this up, because if not, all the fish, because people turn their *lo‘i* into fishponds now, so we’re known to come up here with flashlights and clean this out. And that’s all solid rock underneath. Just about all the way down is solid rock [B. Sills].

We’ve had cases where we had the 40 days and nights of rain... Nu‘uanu Stream was elevated, and when it hits really hard for a couple of hours, then there’s a little bit of a delayed effect as the water presumably is running down the hillside, right, and the stream will rise in elevation for two feet for that next couple of hours. We’ve seen water heaters float by, chunks of wood,

slippers, all manner of rubbish—coolers, chunks of Styrofoam, and I only live, as the crow flies, a mile from probably where the last house is located. That’s a lot of rubbish that gets into the stream [Lageman].

On Kimo Drive, there’s sort of a low point, and when we have flooding it’s really bad there and that there are cracks in that bridge and when there’s flooding it’s bad and there are other places that there are...and when we had a huge sudden rainstorm, this was two years ago, probably, something like that, this stream, the one I showed you—not the *‘auwai*, but the small stream rose up right to the level of this yard and it spewed up there about 20 feet, it slammed down there and took out a lot of land. So if you have an exceptional event, you have a lot of damage here—huge amount of damage. If you have too much water you have the sewers geyser up, the sewer lids lifting up [Wilson].

4.5.10 *‘Auwai* System/Storm Drain Network

There’s a lot of water in this valley, so it’s a very important thing. I certainly would hope that they wouldn’t do anything to turn the *‘auwai* system into a storm drain system. What we’re supposed to do is keep the water clean and keep it flowing. Our group has tried to say, “Let’s just keep it as pure as we can.” Let’s try to help everybody understand that [Wilson].

Interestingly, the research that I’ve done, the storm drain system, the City and County look at the *‘auwai* system as part of the storm drain network (Figure 21). And you know, I’m going to guess as development worked its way up the valley and these *‘auwai* were moved from agriculture to landscape feature that at some point pieces of them worked into the storm drain system. So I don’t think that storm drains are intentionally being ejected into the *‘auwai* and I’m not aware of any that are, but the *‘auwai* are fed, some of the *‘auwai* have become storm drain, and they don’t even look like *‘auwai* anymore [Lageman].

Well, that’s something I don’t really know all that much about [Sills Property] and I do think that I don’t know much about it because I’m in this secluded little spot here (flag lot). I know that there are places that it [storm drains] can plug up. Has the whole *‘auwai* system been turned into being part of the storm drain improvement? I don’t really know the answer to that.... I’ve even asked people in the city and I haven’t been able to figure out...I’ve suggested that I’ve seen



Figure 21. Storm drain from street level.

them call it storm drain improvements, and you can see....for example on Wood Street, we've got two little storm drain openings at the low spot on the street, and I know that they empty into the small stream, which the Board of Water Supply calls an alternate Pahoehoe 'auwai. So I don't know, I think it would be nice to clean that up and understand how the 'auwai system, the stream water system, is linked to the storm drain system [Wilson].

4.5.11 'Auwai Erosion

Some people concrete line them. What I've found is that it's best not to use any concrete or any immovable material at all; even the pipe. The culvert we have is cemented in place, it's stuck, it's not going to change, but if you can leave a ditch open and just let it be an earthen ditch, that's the best way to go. They'll always need maintenance, but if you concrete line it, which I've seen some concrete lining, water finds a way around it. Plus, the other thing too is all waterways slowly erode—that's how the Grand Canyon was formed—slowly they erode. There are a few problems here and there where people have done a really solid cement job where the water can't get around it but the water is still eroding the soil in front of that area so that little cement spot becomes a high point and then what you have is water starts to flow upstream, because it wants to all drop together. I don't know what the erosion factor is, a quarter of an inch every ten years, I don't know, but slowly but surely it erodes and the concrete slows the erosion and the area where the concrete is, it just creates problems. Ideally it should just be open everywhere [Lageman].

4.5.12 Project Site 'Auwai/Storm Drain Improvements

What they could do is they could actually do an open trench up to the 'auwai on both sides, stop for the day; show up first thing in the morning the next day, they would actually temporarily block off the 'auwai and divert that water into Nu'uuanu Stream. Because you're so close to the headwater it wouldn't be that difficult. Block it, dig out that last little bit, drop the pipe in, put in all your backfill, tamp it, at least that area, and then re-contour the 'auwai in that section and then you could open it back up again later that day. And the only thing is, the soil they'd want to use for that would have to be a clay—some kind of a heavy clay-content soil because you wouldn't want it to be just regular topsoil because it would erode off too fast. But if it's densely packed, then water will take the path of least resistance. It should flow right by that spot. It shouldn't be a problem. I wouldn't want to see them do a little concrete thing, because it just doesn't work—it seems like it would, you know, as a builder, do concrete, and you'll have a spillway or something, but water finds a way around and under [Lageman].

So, like I was saying, the City and County wanted to put the storm drain down here. So if they just ran a pipe down here crossing the 'auwai, the 'auwai water would follow the pipe, so it wouldn't continue down. So to prevent that they built a connector with another pipe that goes across here, crossing over their pipe. It goes down to here (Figures 20–22) [B. Sills].

The pipe that's coming out now, you see there's always water coming out. So they were talking about putting one right alongside of it. Another pipe right alongside, and that seems like the most practical. It would be over the big rock. When the water comes out of here and the water comes down from here, this place boils.... They had talked about at one time sleeving this pipe. Putting in a plastic by the top—a pipe inside just to save that seepage. Because it could fix my sinkhole. But nothing came about it. There are so many people that came, that I don't know who's who. There must have been at least 10 different offices, or whatnot, that came. So I just put it on record that I have a sinkhole and something needs to be done before someone gets hurt. My kitchen door is going ajar... But I don't know where the shifting is from. It could be any kind of...But they all have cement pillars underneath—they made these two houses the same time, so basically the pilings are the same way.



Figure 22. Underground to Sills' property; under the 'auwai to white trellis.



Figure 23. Nu'uuanu Stream side of white trellis where storm pipe exits under Sills' property.

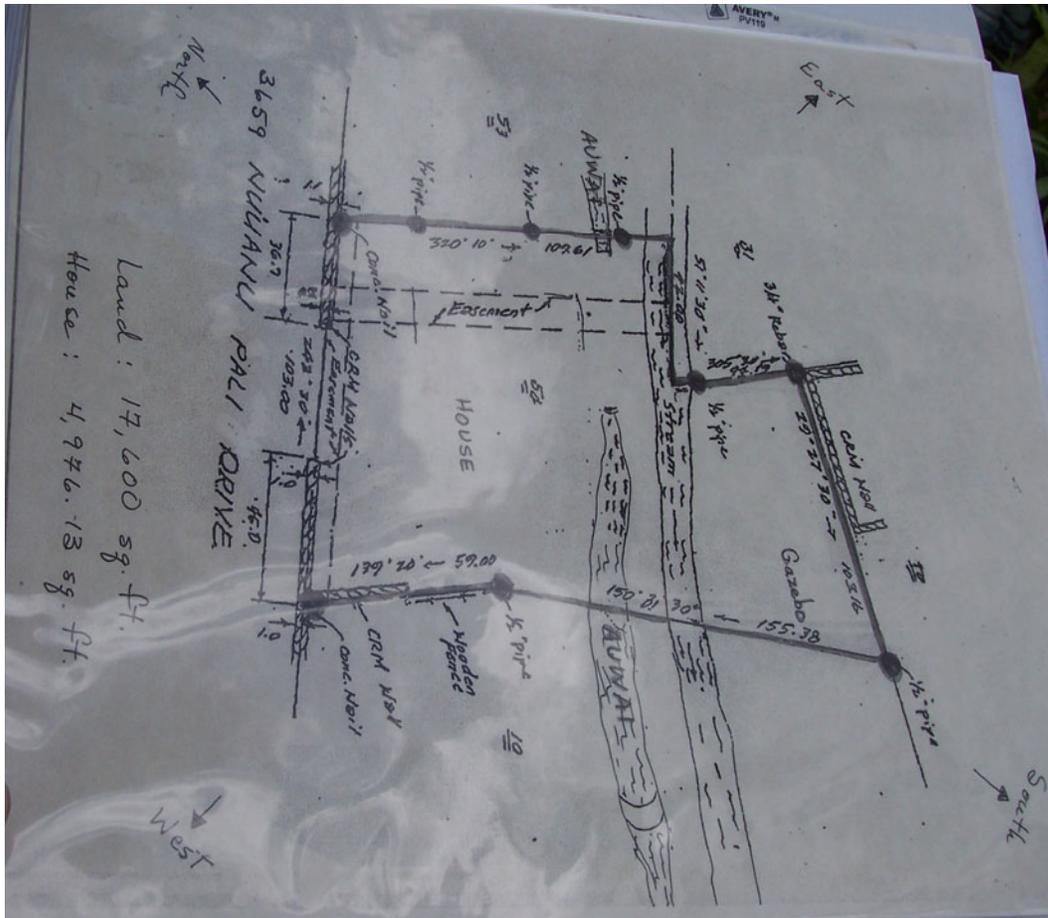


Figure 24. Property Plans illustrating storm drain easement crossing ‘auwai on Sills’ property to Nu‘uanu Stream.

Seepage....and I’m getting sinkholes. So my complaint was the sinkhole. That’s what I complained about. But I called 8 or 7 years ago, and I filled it up about three times already. What they’re proposing to do right now is they took a survey of the road. And the catch system that they have up there, they say that this pipe is not equipped now to carry the rain water from all the roads up here now. So they’re proposing...they need to put a bigger pipe in here. This pipe that they have is a big pipe already so they’re proposing to put another pipe next to it. A plastic pipe because they’re not going to bring equipment down in here now. So they’re proposing to put a plastic pipe in here, another pipe, but how they’re gonna do it—if they’re gonna dig a trench, if they’re gonna do that tunneling....The rotor thing. So that’s one proposal that they have—the rotor, a new pipe here, or along Kimo Drive at the neighbor’s house, coming down cutting in their property. Alongside the bridge I think they have a 5 foot City and County property. So that’s another thing. But they also have to fix the pipe at the bottom...this pipe in here. I crawled in the pipe 30 feet in, which comes to about here where the down fits underneath this pipe; there’s a gap, so that’s where the water’s coming out[B. Sills].

So if you walk down here, some places are soggy, because it still got some seepage going through (Figure 25).

So that’s what the plan is—to tunnel down here and underneath this other pipe—that’s the most logical, if they can tunnel [B. Sills].



Figure 25. Two areas in Sills' yard with evidence of sinkholes.

4.5.13 'Auwai/Stream and Health Issues

The other thing too is, you know the water is full of staph infection, among other things. I've had staph twice since I've moved here. Can't say for sure it's the water—and it's the antibiotic-resistant type that I've had both times—the doctor said if it's not the stream, it's the dirt. But Nu'uaniu Stream has the highest reported incidence of that antibiotic resistant staph in the state. So that's the down side. They do say “Hey when you're in it”—cause I do tell them what I'm doing—they're like “Try to stay dry, you know wear rubber boots. If you have cuts don't get in it. Don't let it get splashed in your eyes if you can.” Cause these are some of the ways that doctors think people are contracting the staph infection [Lageman].

4.5.14 Nu'uaniu Weather/Rainfall

Let's see, well, it's the wet part of Nu'uaniu, Upper Nu'uaniu, not the highest point, but it rains, according to our neighbor one house over with the weather vane, we got 120 inches a year here, average rainfall [Lageman].

4.6 CULTURAL RESOURCES AND USE

This category represents Traditional Hawaiian cultural resources and practices and other ethnic resources and practices. The Traditional Hawaiian cultural resources and practices, includes the pre-contact era, as well as cultural practices after contact. Cultural resources can be the traditional *wahi pana* or sacred places, any cultural gathering place, or the tangible remains of the ancient past. One of the most significant traditional Hawaiian cultural resources is the *heiau* or places of worship. Other places of great significance for all cultures are the burial places of loved ones. Unfortunately with the massive transformation of the landscape as a result of the many battles and western industries (i.e., provisioning, sandalwood, urban development) coupled with the secretive nature of ancient burial practices, most of the ancient burial places are unknown or forgotten and are easily disrupted and disturbed by subsurface activity. Also significant are the remnant features that are evidence of ancient traditional life-systems such as *lo'i kalo* and its *'auwai* or ditch irrigation system of which there are fourteen recorded in Nu'uaniu; one of which runs through the project area.

4.6.1 Project Area and Vicinity: *Lo'i*

Another thing that was proposed is that we have a demonstration *lo'i* project, and the best site would be at Nu'uaniu Valley Park. This *'auwai* goes through the park and then through Queen Emma [Summer Palace]. Mark Ellis who's a delightful young man, a member of our group, was going to spearhead that. He's part-Hawaiian, he's very interested in that kind of thing and he lives down on Park Avenue; he's the eighth generation of his family to live down there. The beginning of that was when Queen Emma gave property all around the edges of her property to different people, including his ancestors, and his family still lives on that piece of property.... Anyhow, that is an ongoing, difficult project. You know Queen Emma had lots of it [*lo'i*] down there where the park is now and across. There was really a lot of it. Actually we haven't tried to document any of it, but if you saw our power point presentation you'd see how extensive they were. They had different names [Wilson].

I think there's some taro down there, but I don't know which taro is the edible one. The big ones are not [taro], except like this one here, it's not the ones for eating, right? But the other one that's in the water, they have. We can go look at that. They used to have patches of taro just all over. They used to tell the yard men they can take it, clean it [B. Sills].

These [ponds] are all *lo'i*. These would be *lo'i*. So I made the falls, so they would have just constant running water...but this would be the *lo'i*, where they had the *lo'i*. I had the story when I first came here, my neighbor gave me a thing about the *lo'i*. That one over there, this one over here, and then those on the other side there too [B. Sills].

First thing was that neighbor telling us that the King ---- would open up the stream to let the water flow down here through the *'auwai* so that his workers could irrigate their taro. He would just open it up once or twice a month and then the water would come down and I guess then he would close it because it didn't need that much or something, I don't know [J. Sills].

4.6.2 Project Vicinity: *Wahi Pana*

Another wonderful feature up here is Kaniakapupu [Wilson].

Across the street at the entrance to O'ahu Country Club, there's a big, fabulous stone, but you can't really see it, you'll have to find out where it is, but just when you go into the entrance, it's on the right. It has a lot of significance. Other things about this valley, the *menehune* are said to have lived here and some other very, very early people lived here, whose names are on my power point presentation, but I can't think of [Wilson].

It [Nu'uaniu] has a long history of being inhabited [Wilson].

Nu'uaniu was always very favored by Hawaiians. The whole *ahupua'a* goes from the Pali all the way down to the harbor area down below. Mark Ellis and I did a power point presentation on the *'auwai* system that tells some of the history. So Nu'uaniu was an important *ahupua'a* and then, of course it achieved enormous prominence when King Kamehameha unified the islands by winning the battle here, which was started elsewhere—[there's] a really nice big poster that shows the whole way the battle went and where it went up here. Anyhow, they landed down in a couple of places on shore, and then the battle just came up here and with the other guys backing up the Nu'uaniu Valley. When they got up Puiwa Road, which is just behind Queen Emma's Summer Palace, they had a decisive battle. Kamehameha I enlisted the help of other people; and they had cannons. They scared their enemies to pieces, so they backed up the Pali, and then you know the famous thing where they backed them off and many Hawaiians fell off the edge of the Pali to their death on the other side. And then Kamehameha said to himself "I'm now the ruler of the islands and I better take care of my people." So he decided to make this into a breadbasket for O'ahu. Nu'uaniu has wonderful water and the climate's good and lots of things grow very

well here. And he built a house, Ahipu‘u, which was across the street from Queen Emma’s Summer Palace and down, well just about across the Pali from maybe where the driveway is, it doesn’t look like it’s on a *pu‘u* now, but it must have been before that area was developed because he wanted a house that was high enough that he could see around him in case any more enemies... And then he began planting; mostly taro, but many different foods as well [Wilson].

[Puiwa] means something like “Bang.” It’s because the cannon was fired here [Wilson].

4.7 PROJECT CONCERNS

Change often meets with resistance, especially if it means changes of lifestyle brought about by outside entities. However, most of the people along Paho‘a ‘Auwai and Nu‘uanu Stream welcomed and accepted responsibility of taking care of their unique water features that they share with their neighbors, as do the people consulted about this storm drainage project. There was generally an agreement that the situation on the Sills property needed to be remedied as not only surrounding property lands, but the ‘*auwai* feature would be jeopardized if the current damaged storm drainage pipes were left as is. One consultant while having a concern, had a remedy or suggested method of assuring the least amount of compromise to the cultural ‘*auwai* feature.

4.7.1 Project: Storm Drainage Improvement

There’s a bad connection there so water leaks. I don’t have a problem with that. I’d just like to see that the rules that we work with on the ‘*auwai* are very simple. You never circumvent water out of the system. Wherever it enters the system it goes all the way through and ultimately leaves the system. However, there are times when we interrupt the flow because you have to do maintenance. This would be one of those times. But we never interrupt it for more than 24 hours because there are koi ponds all along the way that need, water flowing or the fish start to die. And there are also wild animals that live in the system; you’ve seen the ducks. They’re here in large measure because of the ‘*auwai*. As far as City and County doing work that’s no problem. They just need to make an allowance so they don’t interrupt the flow for more than a day because if it’s any longer than that, then people are going to have a problem and ultimately it will become a problem for the City [Lageman].

4.8 CULTURAL IMPACT STUDY SUMMARIES AND ASSESSMENT

4.8.1 Guiding Documents

This cultural impact study/assessment is based on two guiding documents: Act 50 and OEQC Guidelines (see Appendices B and C), as well as the *Criteria for Historic Preservation* cited below.

Act 50

Act 50 [State of Hawai‘i 2000]. H.B. NO. 2895 H.D.1 was passed by the 20th Legislature and approved by the Governor on April 26, 2000 as Act 50. The following excerpts illustrate the intent and mandates of this Act:

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai‘i Revised Statutes, is amended by amending the definitions of "environmental impact statement" or "statement" and "significant effect", to read as follows:

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects....

State Historic Preservation Division Draft Rules (1989)

Criteria for Historic Preservation. The “significance” of a site is determined by a set of criteria.

The following is the State of Hawai‘i criteria for historic preservation:

- Criterion A: Be associated with events that have made an important contribution to the broad patterns of our history.
- Criterion B: Be associated with the lives of persons important in our past.
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value.
- Criterion D: Have yielded, or be likely to yield, information important for research on prehistory or history.
- Criterion E: Have an important historical cultural value to an ethnic group of the state.

4.8.2 Summary of Findings

The following summaries are based on the information presented in the previous sections: the traditional and historical literature review and the ethnographic data and analyses. References are not cited unless it is new information and not already cited in the text above. These summaries

condense the information above, but also serve to focus on a few significant individuals and events in Nu‘uanu’s history in relation to the project lands, as well as give a broad overview of land, water and cultural resources and uses in the general area, as they reflect cultural resources (properties) and practices and access to them.

Summary of Significant People and Events

According to traditional and historical archival material, the traditional *ahupua‘a* of Nu‘uanu has been witness to the comings and goings of many significant people over the span of more than ten centuries. There were several people and events noted and later recorded by explorers, missionaries, native Hawaiian scholars and ethno-historians. Many of these significant people spent time here; were responsible for shifts in polity and commerce, and the gene pool of Hawaii’s *ali‘i* and people.

Mythical Entities

Papa, the Earth mother or ancestor of the Hawaiian people, went to Nu‘uanu, where she met a farmer named Kali‘u who told her that he was so named because the land in the vicinity had no water source. The land was cultivated only with rain water, and this was difficult in the dry summer months. Papa threw a large boulder at nearby Waolani Stream and a spray of water formed a spring on the farmer’s lands. The spring fed a pool, known as Puehuehu, or “spray scattered.”

Another pool, Kunawai, was known as a bathing pond for the *hanai* child of the rainbow goddess and owned by a *mo‘o*, or lizard, from whom the pond was named after. Kunawai was sacred, and the land from the pond to Waolani was *kapu*. In another version the pond was named for an eel deity, and the chief who bathed there was raised by the gods Kane and Kanaloa at Waolani Heiau .

Pu‘unui in Nu‘uanu is said to have been the home of Mo‘oinanea, the highest-ranking *mo‘o* in the islands; a clay pit that was still in existence in the Twentieth Century was her home.

In Nu‘uanu are two sacred stones called “*akua no ka pari*,” or “gods of the precipice,” and they stood on either side of the Pali Trail, wrapped in *kapa*. They were also known as Hapu‘u to whom pigs were offered and Kalaihau‘ole to whom dogs were offered. Another version of these two stones were that they were *mo‘o* guardians of the *pali* to whom ferns and flowers were offered. In another *mo‘olelo* they were said to be the supernatural grandmothers of Pi‘ikea, daughter of Maui *ali‘i nui* Pi‘ilani and his wife Lai‘elohelohe who was the daughter of Kelea, aunt of Pi‘ilani and her second husband Kalamakua, who was son of Kalona-nui and grandson of Kakuhihewa, Oahu *ali‘i nui*; Pi‘ikea was also the wife of Hawaii‘i Island *ali‘i nui* Umi-a-Liloa. Hapu‘u was bad-tempered, while Kalaihau‘ole had healing powers and was kind-hearted. Hapu‘u is said to be a *piko* stone where the umbilical cords of babies were hidden

Menehune of Nu‘uanu and Waolani were said to have fought over a large stone named Pohaku a Umeume which was roughly 10 feet long and 4.5 feet high and is located near the current O‘ahu Country Club. The small indentations that are seen along the edges of the stone are supposedly the fingerprints of the *menehune*. The Waolani *menehune* gained possession of the stone and transported it to where it sits today. Another version of the *mo‘olelo* states that each group of *menehune* pulled the stone in opposite directions because one group wanted the stone to be moved *mauka* and the other *makai* and they continued pulling until dawn, when they dropped the stone in its current location and ran away. Another account reports that the *menehune* king was fighting a giant king and threw Pohaku a Umeume at the giant from Pacific Heights; it hit the giant in the head and killed him and both the giant’s and the *menehune*’s fingerprints were left on the stone.

Yet another version tells of Waolani and Puiwa, occupants of either side of the valley, fighting for the stone. Waolani pulled the stone harder and won it for his portion of the valley and it is his fingerprints that remain on the stone. Still another account states that the stone had powers associated with O‘ahu *ali‘i* Kakuhihewa--the stone could detect a descendant of Kakuhihewa, for only a person that could tilt the stone was a true descendant. The stone was also the location where those of the Kakuhihewa line would have their babies’ umbilical cords cut. If there was a dispute between the mother and father about the baby’s name or upbringing, the stone would decide. The mother or a member of her family would try to move the stone, and a father or a member of his family would attempt the same. The one who was successful won the argument. If neither side could tilt the stone, the priest of Waolani Heiau would choose the name of the baby and determine who would raise the child.

Kaheiki Heiau has an accompanying *mo‘olelo* —the *heiau* was built for Kahanai-a-ke-akua—Kahano and Newa were his caretakers. Kahano, a supernatural being, lay down on the floor of the ocean between Kahiki and O‘ahu, with one arm touching each place. This formed a bridge for the *menehune* to travel between Kahiki and O‘ahu to build Kaheiki Heiau.

It is said that a pack of supernatural dogs protected travelers on the Pali Trail--the dogs belonged to a couple who lived near Kapena Falls in Nu‘uanu. One day, friends of the couple were traveling on the trail toward windward O‘ahu and the dogs howled and blocked the trail in front of them. One of the travelers returned home, but the other continued on the trail and was later killed by robbers. After the incident, people would leave food and flowers for the dogs when they passed by Kapena Falls to thank them for their warning.

Another *mo‘olelo* tells of a race of hairless dogs that were related to the *mo‘o* (Sterling and Summers 1978:312). One of the dogs was killed and cooked on the Kona side of O‘ahu by the Ko‘olau people for tribute to their *ali‘i*. As the cooked dog was being transported from Kona to Ko‘olau, via the Nu‘uanu Pali, the cooked dog spoke, and the frightened people fled. The hairless dogs were not eaten since then, but their breed eventually died out (Sterling and Summers 1978:312).

Ali‘i Nui

One of the first legendary people or families who impacted the history of Hawai‘i was the Nanaula family who came from the south of Hawai‘i islands around the 6th century along with other families from Tahiti and/or Samoa and brought their Polynesian traditions. They peopled all the islands for thirteen or fourteen generations, but acknowledged that another group had come before them. During the 10th century the Paumakua family arrived from Tahiti; they are tied to the Hua family from Lāhainā, Honokahua and Hāna, who were on Maui at least a century before. These people are the ancestors of many of the families of the islands. During the 11th century the Nanamaoa family from the Society Islands established families on the islands of Hawai‘i, Maui and O‘ahu. The Nanamaoa families were shortly followed by Pa‘ao and Pili who came (some say Society Islands, other say Samoa) during the reign of Kapawa (grandson of Nanamaoa and who was the first to be born at O‘ahu’s sacred *ali‘i* birthing place Kukaniloko), and changed the religious and social structures of the island chiefdoms, bringing with them concept of *ali‘i nui*, and the Kū cult which included human sacrifice. Around the beginning of the 12th century great voyages took place to and from the southern islands, but stopped abruptly around the end of that century, around AD 1175, right after the arrival of white foreigners, possibly from Japan.

Most of the islands were ruled by the southern families who were descendants of the ancient Nanaula-Ulu lines, with the exception of Molokai (Kamauaua family) and parts of O‘ahu (Maweke family).

Kaheiki Heiau is mentioned in a *mo'olelo*; the son of a Hawai'i Island chief was kidnapped for sacrifice in Lihu'e, O'ahu. The chief traveled to O'ahu, where Kahilona, the *kahuna* of Kaheiki Heiau, taught him a prayer that would save his son. The prayer freed the son from bondage, and the chief and his son went into hiding. The chief later learned a prayer for killing his enemy, and he carried this out on Hawai'i Island.

Significant Events/Places

A significant ancient event in Nu'uaniu was when Papa and Wakea made it their homeland....

Pu'iwa, is a place in Nu'uaniu and also the name of a pool and a cave. In one account Pu'iwa was named for an event that occurred in the battle of Nu'uaniu. During the battle, Kamehameha fired a cannon at a stone wall until it fell. Behind the wall, Kalanikupule's men were startled, or "*pu'iwa*." A second story tells of a father who asked his daughters to bury him in Pu'iwa so that *wauke* trees would grow from his body; they carried out his request, and since that time, *kapa* could be made. A third story asserts that an ancestor of the Kaua'i chiefs was buried in a cave at Pu'iwa.

Historic People

Other than O'ahu and Maui *ali'i nui*, as noted above, Kamehameha I transformed Nu'uaniu when he battled the Maui/O'ahu chiefs and warriors for control of the islands. He led major battles in Nu'uaniu and literally conquered O'ahu at Nu'uaniu Pali.

His second royal son, Kamehameha III, was responsible for transforming traditional *ali'i nui* land stewardship to the modified western practice of private land ownership in the Great Māhele (ca. AD 1846-1856). During the Māhele period when lesser chiefs and *konohiki* were claiming or being assigned lands, the Native/Foreign Register and Native/Foreign Testimony to the Land Commission provided information as to the people of the project area, as well the resources and use. The lands of Luakaha, Ahupua'a of Nu'uaniu Kamehameha III kept for himself with Charles Kanaina as heir (Baker and Baker 1989:25). His royal wife Hazaleponi Kapakuhaili, better known as Queen Kalama made a Land Commission Award claim for house lot lands in Luakaha ["Here is this house lot of mine, at Luakaha in Nuuanu on the northwest side next to the lot of Keonl Ana."], but the claim was not awarded. Other significant historic people and entities associated with these lands are Dowsett and Eastman.

Summary of Land, Water, and Cultural Resources and Use

Various resources and land-use patterns are physically evident as well as recounted in the literature. Usually the ancient physical evidence remains in the form of stone ruins that are fortunate to have been preserved relatively intact. Clues regarding function and use can sometimes be extrapolated from the stories, songs, chants and ethno-historical observations that were also fortunately recorded, as well as from the cultural remains identified during surface and sub-surface studies. Several sites still exist today in nearby areas. Together the stories and ancient features indicate land use that started several hundred years ago.

Ancient Land and Water Resources and Use (Pre-Contact)

The project lands were once part of an ancient land-use fertile valley system that included ritual, ceremony, habitation and agricultural resources and practices as evidenced by the features in the vicinity, that are mentioned in traditional legends and oral histories. The best evidence is the traditional irrigation ditch or *'auwai* that runs through the projects lands and once flowed through

taro patches that sustained the people of the area. These *'auwai* flowed from the Nu‘uanu Stream; its resources would also have been utilized from ancient times as people living on its banks and farm lands would catch *'o‘opu* and *'opae*.

Historic Land and Water Resources and Use (Post-Contact)

The native (NT/NR) and foreign (FT/FR) testimonies and registers of the Māhele land claims process of the mid-1800s provide a view of lands already in transition. Over seventy-five years had passed since first western contact by Captain Cook (1778); fifty-five years since warfare had devastated the Nu‘uanu landscape; and twenty-eight years had passed since the missionaries arrived (1820). The devastating sandalwood era was winding down, but not before heavily modifying the landscape by denuding much of the upper forests and *kula* lands and taxing the valley farm systems as farmers were also ordered to leave their farms to help harvest sandalwood. The lands were utilized as house lots as well as agricultural and pasture lands.

The ancient practice of utilizing streams for the cultural practice of taro cultivation and catching fish and crayfish continued through historic times in the project lands and vicinity. At least fourteen traditional *'auwai* were recorded in Nu‘uanu Valley coming off the Nu‘uanu Stream. However, as the cultural practices were slowly replaced by more western lifestyles and land use [cattle ranching; urban development] the ancient practices were discontinued. While the *'auwai* in the project area did not stop flowing, its purpose for being changed from taro *lo‘i* to fishponds and the *'auwai* modified to accommodate a storm drainage pipe.

Summary of Survey Findings (Cultural and Historical Resources and Practices)

Cultural Resources

This category entails sites or places associated with significant events and/or people important to the native Hawaiian patterns of prehistory; embody distinctive characteristics; or are likely to yield information important for research on the prehistory of Hawai‘i. It also includes sites that yield resources important for native Hawaiian Cultural Practices, past and present; and items that are part of a cultural context. *Wahi Pana* or sacred places are important cultural resources to native Hawaiians regardless that the original sites that may have been there no longer exist. Often it is not the lack of interest but the lack of knowledge of whereabouts or more likely, lack of access that prevent native Hawaiians from visiting these sites. The primary cultural resource in the project lands is the *'auwai* feature and *lo‘i*. The *'auwai* continues to flow, but it is no longer used to irrigate taro patches; it has become a water feature with other uses.

Cultural Practices

This category includes items that are essential to the practices that have cultural value to either native Hawaiians or other ethnic groups. This category may overlap Cultural Resources. The cultural practice of maintaining *'auwai* continues but in a non-traditional way. Using the *'auwai* to irrigate taro patches is no longer a cultural practice’ although remnant taro is still found in the project lands.

Historic Resources

This category entails sites associated with significant events and/or people important to the broad patterns of history (post Western contact), which includes other ethnic groups; embodies distinctive characteristics of an historic era or master; or are likely to yield information important for research on

the history of Hawai‘i. There does not seem to appear to be any historic structures on the project lands.

General Consultant Concerns Regarding the Proposed Project:

- Health Issues: staph bacteria in the waters
- Water Issues: Not enough maintenance
- Erosion/Poor Drainage Issues: sinkholes

OEQC Guideline Criteria in Relation to Project Lands:

According to the OEQC Guidelines, the types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, religious and spiritual customs.

4.8.3 Cultural Properties/Practices Directly Affected by the Proposed Project:

Cultural feature (‘*auwai*) at Project Site

4.9 CULTURAL IMPACT ASSESSMENT

4.9.1 Cultural Resource (Land) Impact

The lands within the Nu‘uanu Storm Drainage project area were heavily impacted by the historic activities of the 18th, 19th and 20th Centuries. Many cultural sites or resources would have been destroyed or damaged by warfare, ranching, urban development and their related activities. However, there are still cultural resources related to traditional agriculture (former *lo‘i*) on project lands that are typical of traditional *ahupua‘a* lifestyle and use, albeit heavily modified remnants. This resource is in an impact zone and will need to be assessed to determine the extent/type of protective buffer.

4.9.2 Cultural Practices/Access (Land) Impact

There are no current cultural practices in the project area and no need for access, therefore, no impact on cultural practices.

4.9.3 Cultural/Historical Resource (Feature) Impact

The Nu‘uanu Stream and Paho‘a ‘Auwai are both cultural and historical features. There is concern regarding storm drainage improvement activity and the ‘*auwai* section in the Sills’ back yard. Suggested measures should be considered to assure that the ‘*auwai* (land) will not be compromised any more than it already is; and that ‘*auwai* (waters) downstream will not be jeopardized.

4.9.4 Recommendations/Mitigation

***Lo‘i* Buffer**

Provide a buffer to the *lo‘i* (now fishpond) to assure that it is not damaged.

‘*Auwai* Protection

The following suggestion was given by another consultant, who is not only downstream of this ‘*auwai* section, but a construction contractor:

What they could do is they could actually do an open trench up to the ‘*auwai* on both sides, stop for the day; show up first thing in the morning the next day, they would actually temporarily block off the ‘*auwai* and divert that water into Nu‘uanu Stream. Because you’re so close to the headwater it wouldn’t be that difficult. Block it, dig out that last little bit, drop the pipe in, put in all your backfill, tamp it, at least that area, and then re-contour the ‘*auwai* in that section and then you could open it back up again later that day. And the only thing is, the soil they’d want to use for that would have to be a clay—some kind of a heavy clay-content soil because you wouldn’t want it to be just regular topsoil as it would erode off too fast. But if it’s densely packed, then water will take the path of least resistance. It should flow right by that spot. It shouldn’t be a problem. I wouldn’t want to see them do a little concrete thing, because it just doesn’t work—it seems like it would, you know, as a builder, do concrete, and you’ll have a spillway or something, but water finds a way around and under [Lageman].

5.0 CONCLUSION AND RECOMMENDATIONS

Archaeological survey yielded no evidence of surface remains in the APE for drainage improvements at TMK:2-2-051:054. However, an underground *'auwai* flows through the APE and subsurface agricultural deposits might be present. Because of the presence of the *'auwai* and the likelihood of cultural deposits in the area, full time archaeological monitoring is recommended for any ground disturbing work associated with the storm drain improvement.

The ethnographic survey gathered information about traditional cultural practices, ethnic cultural practices and pre-historic and historic cultural resources. Consultants noted concerns about disruption of the *'auwai* flow, particularly that the *'auwai* flow is not interrupted for longer than 24 hours to minimize damage to koi ponds downstream.

The biological survey and wetlands assessment concluded that Nu'uaniu Stream itself would not be impacted by the undertaking. No wetlands were observed in the area, and it is not likely that state or federally listed species utilize the vicinity.

6.0 GLOSSARY

- ahupua‘a** Traditional Hawaiian land division, usually extending from the uplands to the sea.
- ali‘i** Chief, chiefess, monarch, ruler, etc.
- ‘ape** The large plants *Alocasia macrorrhiza* or *Xanthosoma roseum*, that resemble taro. In traditional Hawai‘i, ‘ape was planted near gates, and leaves were placed under the sick because they were believed to deter evil spirits. They were not planted near houses.
- ‘auwai** Ditch, usually to irrigate wetland agricultural fields.
- ‘ewa** Place name west of Honolulu used as a directional term.
- ginger** The plant *Zingiber*, that produces fragrant flowers.
- hānai** Adopted or foster child.
- hau** The indigenous tree *Hibiscus tiliaceous*, which had many uses in ancient Hawai‘i. Sandals were fashioned from the bark and cordage was made from fibers. Wood was shaped into net floats, canoe booms, and various sports equipment, and flowers were used medicinally.
- hōlua** An ancient sled used on grassy slopes or the sled course.
- heiau** Traditional Hawaiian place of worship.
- heiau luakini** Large temple where human sacrifices were offered.
- Kahiki** A far away land, sometimes refers to Tahiti.
- kahuna** Priest, sorcerer.
- kalo** *Colocasia esculenta*, or taro, introduced to Hawai‘i by Polynesians, and the staple of the Traditional Hawaiian diet.
- kapa** Tapa cloth.
- kapu** Sacred, forbidden.
- keiki** Child, offspring, descendant, youngster, shoot or sucker, as of taro.
- kukui** The candlenut tree, or *Aleurites moluccana*, the nuts of which were eaten as a relish and used for lamp fuel in traditional times.
- kula** Open country, pasture, dry land as opposed to wet taro land.
- ‘ili** A land section, usually a subdivision of an *ahupua‘a*.
- lo‘i, lo‘i kalo** An irrigated terrace or set of terraces for the cultivation of taro.
- luna** Foreman, boss, leader, supervisor.

<i>luna wai</i>	Person in charge of water distribution.
<i>mahalo</i>	Thank you.
<i>makai</i>	Toward the sea.
<i>mauka</i>	Toward the mountains.
<i>menehune</i>	Small people of legend who worked at night to build structures such as fishponds, roads, and <i>heiau</i> .
<i>mō'ī</i>	A rank of chiefs who could succeed to the government but were a lower rank than chiefs descended from the god Kāne.
<i>mo'ō</i>	Lizard, dragon, water spirit.
<i>'ō'ō</i>	Digging stick, spade.
<i>o'opu</i>	Fish of the families <i>Eleotridae</i> , <i>Gobiidae</i> , and <i>Bleniidae</i> .
<i>'ōpae</i>	Shrimp.
<i>pali</i>	Cliff, steep hill.
<i>piko</i>	Navel, umbilical cord.
<i>pīkoi</i>	A tripping club, usually made of wood or stone, with rope attached to subdue an enemy.
<i>pu'uhonua</i>	Place of refuge.
<i>wauke</i>	The paper mulberry, or <i>Broussonetia papyrifera</i> , which was made into <i>kapa</i> in traditional Hawai'i.

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APPENDIX A: BIOLOGICAL SURVEY AND WETLAND ASSESSMENT

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Biological survey in support of an Environmental Assessment for a drainage improvement project in upper Nu‘uanu Valley, O‘ahu, Hawai‘i¹

June 12, 2007

AECOS No. 1146

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Introduction

This report details the results of a brief biological survey undertaken at and near the intersection of Old Pali Road and Nu‘uanu Pali Drive in upper Nu‘uanu Valley, just above Ala Kimo Drive, in Honolulu (Fig. 1). The project involves repair and/or reconstruction of a street drain crossing the intersection of Old Pali Road and Nu‘uanu Pali Drive and extending down slope through a privately owned parcel at 3659 Nu‘uanu Pali Drive to an existing outlet close to Nu‘uanu Stream. The purpose of the field visit and this assessment is to establish whether or not natural biological resources, listed species, and/or sensitive natural environments such as wetlands are present on the site.

The project site is a paved roadway above and maintained yards of a private home located along the stream. Nu‘uanu Stream, a perennial stream (State ID No. 3-3-09) is the receiving water for the storm drain, which physically terminates above the normal level of the water in the stream. In addition to the stream, which is incorporated into the landscapes of the houses in this area (Fig. 2), an auwai system—fed from an intake further upstream on Nu‘uanu Stream—is incorporated into the landscaping of homes located along the right bank of the stream. This flow is carried in improved (concrete and/or stone lined) open channels and pipes, and supplies decorative ponds on several properties. The project crosses the auwai where the flow is confined to a pipe.

¹ Report prepared for Garcia & Associates, Honolulu. This report will become part of the public record for the project.

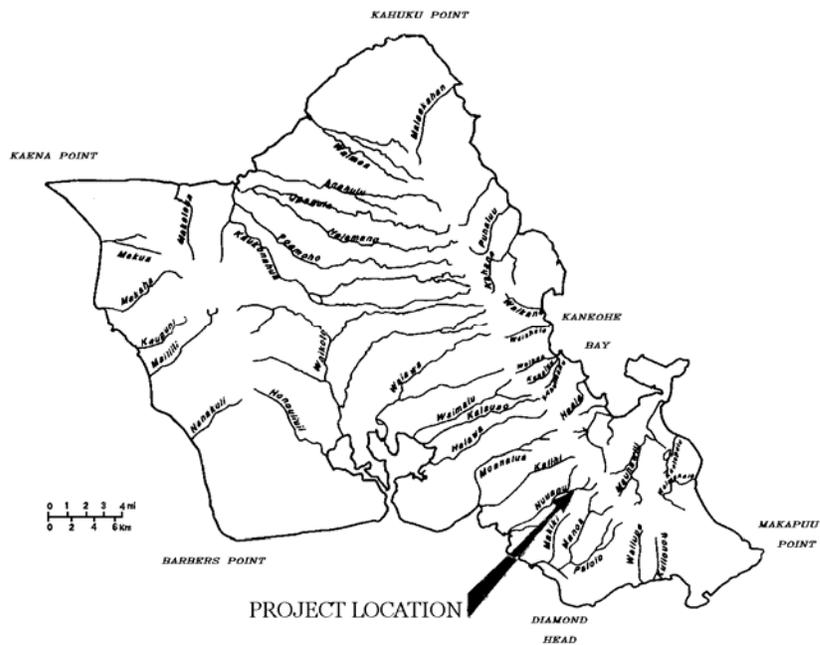


Figure 1. General location map of project location on O'ahu.

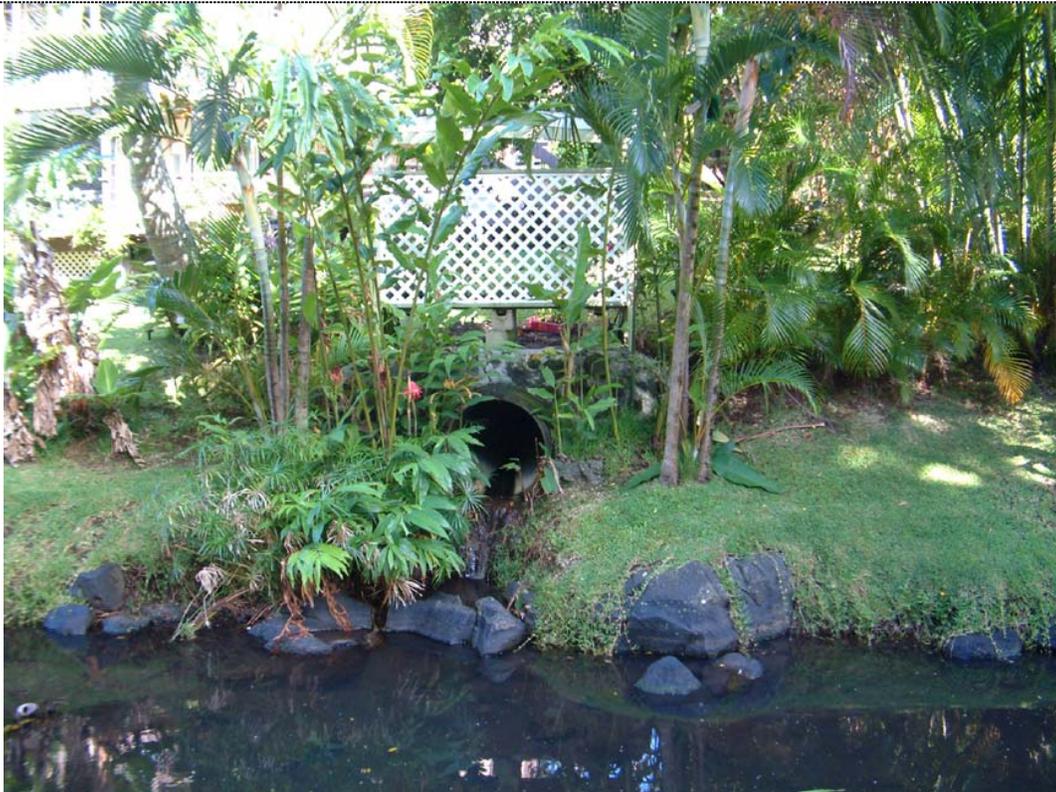


Figure 2. 30-inch street drain outlet on lot TMK: 2-2-051:054 seen from opposite bank of Nu'uuanu Stream.

Site Description

A biological field survey of the drain pipe repair site on lot TMK: 2-2-051:054 was undertaken on April 9, 2007 by Eric Guinther of AECOS, Inc. Listings of plants and animals noted were made at the time. Most of the vegetation consisted of ornamental or landscape plants, as is evident from Fig. 3.



Figure 3. Surveying Nu'uuanu Stream downstream of the drainage outlet in Fig. 2. The Ala Kimo Drive bridge is in the background. Note the maintained nature of the entire riparian zone.

Nu'uuanu Stream in the vicinity of the project, is incised on the order of 0.5 to 1.5 m (increasing upstream at this location) and the bed is boulder-filled. Bottom sediments are coarse sand and gravel, but a thin surface layer of silt was present at the time of the survey. The banks are a mix of massive basalt (especially evident upstream of the site), basalt boulders, and mowed grass on soil. The entire area is well maintained as a garden setting on both sides of the stream (Fig. 3).

Most common plants close to the stream in the project area were the lawn grasses: St. Augustine grass (*Stenotaphrum secundatum*) and broad-leaved carpet grass (*Axonopus compressus*). Other plants noted as present at the project site included:

umbrella sedge (*Cyperus involucratus*), golden-fruited palm (*Dyopsis lutescens*), torch ginger (*Alpinia purpurata*), heliconia (*Heliconia psittacorum*), palmgrass (*Setaria palmifolia*) and wedelia (*Sphagneticola trilobata*). In addition, various weedy species were observed—generally in small numbers because the area is well-maintained—such as nut grass (*Cyperus rotundus*), Oriental hawksbeard (*Youngia japonica*), yellow wood sorrel or 'ihi'ai (*Oxalis corniculata*), pipili (*Drymaria cordata*), wood fern (*Christella dentata*), and Koster's curse (*Clidemia hirta*). None of these plants raise any particular concerns.

Plants occurring in the general vicinity and associated with Nu'uuanu Stream in this area are kamole (*Ludwigia octovalvis*), sour bush (*Pluchea carolinensis*), day flower (*Commelina diffusa*), blue 'ape (*Xanthosoma violaceum*), begonia (*Begonia hirtella*), maile hohono (*Ageratum conyzoides*), false heather (*Cuphea hyssopifolia*), California grass (*Urochloa mutica*), sessile joyweed (*Alternanthera sessilis*), and niruri (*Phyllanthus debilis*). Again, given the manicured nature of the stream banks, these plants occur mostly in low numbers and none requires any concern.

The project focus, a drainage pipe, held no water and therefore had no aquatic fauna. The adjacent stream supported several species of fishes, notably introduced poecilids (juveniles), cichlids (*Hemichromis elongatus* and others), smallmouth bass (*Micropterus dolomieu*), and suckermouth catfish (*Hypostomus cf. watwata*). All were present in generally small numbers. Invertebrates noted were two species of snail (*Melanoides tuberculata* and *Physa* sp.) and the flume clam (*Corbicula fluminea*).

Discussion

Habitats currently found on the project site are those associated with urban, developed land and Nu'uuanu Stream passing through in a more-or-less natural bed. Low head dams are present, creating mostly a series of pools. The nature of the site is such that usage by any state or federally listed species is very unlikely. In any event, the natural feature, Nu'uuanu Stream, will not be directly impacted by the project. Drainage pipe replacement stops short of the stream itself. Water quality impacts during construction are possible, but can be mitigated by best management practices (BMPs) that prevent disturbed earth from washing or falling into the stream.

Nu'uuanu Stream is described in the state's perennial stream assessment (Hawaii Cooperative Park Service Unit, 1990.) as having limited (L) aquatic resource value. Clearly, in the project area, although the project is in close proximity of Nu'uuanu Stream, other considerations such as cultural resources, recreational resources, and riparian resources are generally moot. The proposed project is too small to impact in any way on such resources elsewhere in the valley.

No special or unique ecological resources are located on the site or nearby. There are no wetlands, as defined by the U.S. Army Corps of Engineers (ACOE, 1987) in the area of the proposed pipe repair/replacement. However, Nu'uuanu Stream is jurisdictional and considered waters of the U.S. for regulatory purposes, subject to oversight by the Army Corps, Hawai'i Department of Land and Natural Resources (DLNR), and the Hawai'i Department of Health (HDOH). State and federal jurisdictions include the bed and banks of the stream; and HDOH regulates stream water quality, most discharges, and runoff into the stream associated with construction activities. The boundary with respect to federal jurisdiction in a stream such as Nu'uuanu is known as the ordinary high water mark (OHWM). The Corps definition of the OHWM at 33 CFR 328.3 (e)² states that:

“The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

It is very likely, given the flashy nature of O'ahu streams, that Nu'uuanu Stream on occasion rises well up onto the lawn areas lateral to the stream as shown in Fig. 3, and the mouth of the culvert to be repaired or replaced, is within the flow under such conditions. These freshet flows are not the ordinary level of the stream. The OHWM in this location appears to be within the 0.5 m physical incision of the stream as shown in Fig. 3 and physically below the open discharge end of the culvert judged to be 3 ft (1 m) above the stream. Nonetheless, the ACOE should be notified and provided plans of the proposed repair in the vicinity of the stream, and all regulations promulgated by HDOH for construction activities impacting on state waters should be adhered to. Although it is my opinion that the project will not impinge on federal jurisdictional waters, only the ACOE can establish this fact, and my basis of determination is the existing structure and not a proposed replacement structure that may differ in important respects.

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² CFR is Code of Federal Regulations.

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APPENDIX B: GUIDELINES FOR ASSESSING CULTURAL IMPACTS

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Guidelines for Assessing Cultural Impacts
Adopted by the Environmental Council, State of Hawai'i
November 19, 1997

I. INTRODUCTION

It is the policy of the State of Hawai'i under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

II. CULTURAL IMPACT ASSESSMENT METHODOLOGY

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The types of cultural resources The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua`a;
2. identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
3. receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
4. conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
5. identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
6. assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

III. CULTURAL IMPACT ASSESSMENT CONTENTS

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

- 1.A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.
- 2.A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.
3. Ethnographic and oral history interview procedures, including the circumstances, under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.

4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.
5. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
6. A discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.
7. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.
8. An explanation of confidential information that has been withheld from public disclosure in the assessment.
9. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.
10. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.
11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS. If you have any questions, please call 586-4185.

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APPENDIX C: BILL FOR ENVIRONMENTAL IMPACT STATEMENTS

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A BILL FOR AN ACT RELATING TO
ENVIRONMENTAL IMPACT STATEMENTS
[UNOFFICIAL VERSION]

HOUSE OF REPRESENTATIVES H.B. NO, 2895 H.D.1
TWENTIETH LEGISLATURE, 2000
STATE OF HAWAII

A BILL FOR AN ACT
RELATING TO ENVIRONMENTAL IMPACT STATEMENTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawai'i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai'i Revised Statutes, is amended by amending the definitions of "environmental impact statement" or "statement" and "significant effect", to read as follows:

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[.], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval.

Approved by the Governor as Act 50 on April 26, 2000

APPENDIX D: CONSENT FORM

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Consent Form

Agreement to Participate in this Cultural Impact Study/Assessment

Project Title: **Nu`uanu Pali Drive
Storm Drainage Improvement Project CIS/A**

Investigator: Maria Orr, M.A.
Kaimipono Consulting Services LLC

You are being asked to participate in a cultural impact study/assessment [CIS/A] conducted by an independent investigator contracted by *Garcia & Associates* (Ganda) as part of a larger environmental impact study by *Environmental Communications* for the *City & County of Honolulu*. The investigator will explain the purpose of this study, the procedures to be used, the potential benefits and possible risks of participating. You may ask the investigator any question(s) in order to help you to understand the study or procedures. A basic explanation of the study is written below. If you then decide to participate in the study, please sign on the second page of this form. You will be given a copy of this form to keep.

I. Nature and Purpose of the Study

The purpose of this cultural impact study/assessment is to gather information about the project lands and vicinity in the *ahupua`a* of Nu`uanu, Traditional District (*moku*) of Kona, O`ahu through interviews with individuals who are knowledgeable about this area, and/or about traditional and historic information such as cultural practices, legends, songs, chants or other information. The objective of this study is to facilitate in the identification and location of any possible pre-historic and/or historic cultural resources, or traditional cultural practices in the area mentioned above, in accordance with applicable historic preservation laws, regulations, and guidelines, including: Office of Environmental Quality Control [OEQC] Guidelines and Act 50 HB2895 [A.D.2000], HRS Chapter 343

II. Explanation of Procedures

After you have voluntarily agreed to participate and have signed the consent page, the investigator will tape record your interview and have it transcribed later. Data from the interview [ethnographic research] will be used as part of the background historical summary for this project. The investigator may also need to take notes and/or ask you to spell or clarify terms or names that are unclear.

III. Discomforts and Risks

Foreseeable discomforts and/or risks may include, but are not limited to the following: having to talk loudly for the recorder; being recorded and/or interviewed; providing information that may be used in reports which may be used in the future as a public reference; knowing that the information you give may conflict with information from others; your uncompensated dedication of time; possible miscommunication or misunderstanding in the transcribing of information; loss of privacy; and worry that your comment(s) may not be understood in the same way you understand them. It is not possible to identify all potential risks, however reasonable safeguards have been taken to minimize risks.

IV. Benefits

This study will give you the opportunity to express your thoughts (*mana`o*), and your opinions will be listened to and shared; your knowledge may be instrumental in the preservation of significant cultural resources, practices and information.

V. Confidentiality

Your rights of privacy, confidentiality and/or anonymity will be protected **if you so desire**. You may request, for example, that your name and/or sex not be mentioned in write-ups, such as field notes, on tape, on files (disk or folders), drafts, reports, and future works; or you may request that some of the information you provide remain “off-the-record” **and not be recorded in any way**. In order to ensure protection of your privacy, confidentiality and/or anonymity, you should immediately advise the investigator of your desires. The investigator will ask you to specify the method of protection, and note it on this form below.

VI. Refusal/Withdrawal

You may, at any time during the interview process, chose to not participate any further and ask the investigator for the tape and/or notes. Please note that you will be given an opportunity to review your transcript, and to revise or delete any part of the interview.

VII. Waiver

Part I: Agreement to Participate

I, _____, understand that Maria Orr, an independent investigator contracted by Garcia & Associates (Ganda) will be conducting oral history interviews with individuals knowledgeable about the project lands and vicinity, in the ahupua`a of Nu`uanu, Traditional District (moku) of Kona, O`ahu. The oral history interviews are being conducted in order to collect information on possible pre-historic and/or historic cultural resources, as well as traditional cultural practices associated with these lands and access to these resources and practices.

I understand I will be provided the opportunity to review my interview to ensure that it accurately depicts what I meant to say. **I also understand that if I don’t return the revised transcripts after two weeks from date of receipt, my signature below will indicate my release of information for the draft report. I also understand that I will still have the opportunity to make revisions during the draft review process.**

_____ I am willing to participate.

_____ I am willing to participate, under the following conditions:

_____	_____
Consultant Signature	Date
_____	_____
Print Name	Phone

Address	

MAHALO NUI LOA

Part II: Personal Release of Interview Records

I, _____, have been interviewed by Maria Orr of Kaimipono Consulting Services LLC, an independent investigator contracted by Garcia & Associates (Ganda). I have reviewed the written transcripts of tape recordings of the interview, and agree that said documentation is complete and accurate except for those matters specifically set forth below the heading “CLARIFICATION OR CORRECTIONS.”

I further agree that Ms. Orr and Ganda/Environmental Communications may use and release my identity and other interview information, both oral and written, for the purpose of using such information in a report to be made public, subject to my specific objections, to release as set forth below under the heading “SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS.”

CLARIFICATION OR CORRECTIONS:

SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS:

_____ Consultant Signature	_____ Date
_____ Print Name	_____ Phone
_____ Address	_____ Zipcode

MAHALO NUI LOA

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APPENDIX E: BASIC RESEARCH INSTRUMENT FOR ORAL HISTORY INTERVIEWS

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Basic Research Instrument for Oral History Interviews
2069 Nu`uanu CIS/A,

This research instrument includes basic information as well as research categories which will be asked in the form of open primary questions which allow the individual interviewed (Consultant) to answer in the manner he/she is most comfortable. Secondary or follow-up questions are asked based on what the Consultant has said and/or to clarify what was said. The idea is to have an interview based on a “talk-story” form of sharing information. Questions will NOT be asked in an interrogation style/method, NOR will they necessarily be asked in the order presented below. This research instrument is merely a *guide* for the investigator and simply reflects general categories of information sought in a semi-structured format. Questions will be asked more directly when necessary.

The Consultants were selected because they met one or more of the following criteria:

- ❖ Referred By Ganda Staff
- ❖ Had/has Ties to Project Area/Vicinity
- ❖ Known Hawaiian Cultural Resource Person
- ❖ Known Hawaiian Traditional Practitioner
- ❖ Referred By Other Cultural Resource People

[NOTE: This part of the interview, #1-4 is mutual sharing and rapport building. Most of the information for research categories “Consultant Background” and “Consultant Demographics” come from this section, but not exclusively.]

1. *To start please tell me about yourself...Name? Where/When you were born?*

[This information can be addressed in a couple of ways. After the investigator first turns on the tape recorder, the following information will be recorded: Day/Date/Time/Place of Interview/Name of Consultant (if authorized by Consultant)/Name of Investigator/Questions: Have you read the Agreement To Participate?/Do you have any questions before we begin?/Will you please sign the Consent page. The investigator will explain again the purpose of the interview.

The investigator will then ask the Consultant to “Please tell me about yourself--when/where were you born? where did you grow up? where did you go to school?” This general compound question allows the Consultant to share as much or as little as he/she wants without any pressure. Most of the information for #1 may already be known to the investigator.]

2. *History: Your `ohana/family background; Hawaiian connection (if any)?*

[Much of the information for questions #2, 3, and 4 usually comes from the “monologue” answer to Question #1. If it does not, then these questions will be asked. The answers in this section usually establish how the Consultant meets the criteria; how the Consultant developed his/her information base, etc.]

3. *Youth: Where lived? Grew up?* [This may have been answered in #1]
4. *Schooling? Where? When?* [This may have been answered in #1]

[NOTE: The next part of the interview, #5-7 reflects information sought for the following research categories: Land, Water, Marine, Cultural Resources and Use as well as Significant People, and Events. The questions are open-ended

so as NOT to “put words in the mouths” of the Consultants. The answers will help in assessing if any cultural properties or practices will be impacted by the proposed project.]

5. *Can you tell me what you know about the lands of Nu`uanu? Auwai?*

[NOTE: Generally when people share information about a specific topic/place, they usually state where their information came from. If it isn't volunteered, it is asked as a follow-up question(s). A map of the project area should be available to confirm that investigator and consultant are talking about the same place. Photos would also help if a field trip is not possible. The best scenario would be to be “on-site” at some part of the interview...although this is not always practical.]

6. *What are your recollections and/or personal experiences of this area?*

7. *Do you know any stories/legends/songs/chants associated with these areas?*

[NOTE: Possible follow-up questions:

- How are you or your family connected to the lands of Nu`uanu?
- What year(s) were you and/or your family associated with these lands?
- Can you describe what the area looked like--what kinds of natural and/or man made things?
- To your knowledge what kind of activities took place in this location?
- Do you know of any traditional gathering of plants, etc in the area?
- Please describe any other land/water use? Resources?
- What was the historic land use? Agriculture? Habitation? Dwellings? Military?
- **[Have map ready for marking.]**
- Do you know about any burials in the project area?
- Do you know of any cultural sites in the project area or vicinity?

8. *Is there anyone you know who can also tell me about the project area?*

[NOTE: Usually in the course of the interview, Consultants suggest other people to interview.]

9. *As soon as the tape of this interview is transcribed I will send you two sets. Please review your transcripts and make any corrections and/or additions, then sign both copies of the Release Forms thereby allowing the information to be used by the investigator, Garcia and Associates (Ganda) and Environmental Communications. Then mail one set back in the enclosed stamped-addressed envelope.*

10. *If your revised transcript is not returned within two weeks of date of receipt, it will be assumed that you are in concurrence with the transcript material and your information will then be incorporated into any draft reports. However, you can still make changes during the draft review process.*

MAHALO NUI LOA

APPENDIX F: SIGNED CONSENT FORMS

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V. Confidentiality

Your rights of privacy, confidentiality and/or anonymity will be protected if you so desire. You may request, for example, that your name and/or sex not be mentioned in write-ups, such as field notes, on tape, on files (disk or folders), drafts, reports, and future works; or you may request that some of the information you provide remain "off-the-record" and not be recorded in any way. In order to ensure protection of your privacy, confidentiality and/or anonymity, you should immediately advise the investigator of your desires. The investigator will ask you to specify the method of protection, and note it on this form below.

VI. Refusal/Withdrawal

You may, at any time during the interview process, chose to not participate any further and ask the investigator for the tape and/or notes. Please note that you will be given an opportunity to review your transcript, and to revise or delete any part of the interview.

VII. Waiver

Part I: Agreement to Participate

I, Guy C. Lageman understand that Maria Orr, an independent investigator contracted by Garcia & Associates (Ganda) will be conducting oral history interviews with individuals knowledgeable about the project lands and vicinity, in the ahupua`a of Nu`uanu, Traditional District (moku) of Kona, O`ahu. The oral history interviews are being conducted in order to collect information on possible pre-historic and/or historic cultural resources, as well as traditional cultural practices associated with these lands and access to these resources and practices.

I understand I will be provided the opportunity to review my interview to ensure that it accurately depicts what I meant to say. I also understand that if I don't return the revised transcripts after two weeks from date of receipt, my signature below will indicate my release of information for the draft report. I also understand that I will still have the opportunity to make revisions during the draft review process.

I am willing to participate.
 I am willing to participate, under the following conditions:

Guy C. Lageman 5-9-07
Consultant Signature Date
Guy C. Lageman 408-778-7723
Print Name Phone
3507 Nuuanu Pali Dr., Hono 96817
Address

MAHALO NUI LOA

V. Confidentiality

Your rights of privacy, confidentiality and/or anonymity will be protected if you so desire. You may request, for example, that your name and/or sex not be mentioned in write-ups, such as field notes, on tape, on files (disk or folders), drafts, reports, and future works; or you may request that some of the information you provide remain "off-the-record" and not be recorded in any way. In order to ensure protection of your privacy, confidentiality and/or anonymity, you should immediately advise the investigator of your desires. The investigator will ask you to specify the method of protection, and note it on this form below.

VI. Refusal/Withdrawal

You may, at any time during the interview process, chose to not participate any further and ask the investigator for the tape and/or notes. Please note that you will be given an opportunity to review your transcript, and to revise or delete any part of the interview.

VII. Waiver

Part I: Agreement to Participate

I, BEN SULLS, understand that Maria Orr, an independent investigator contracted by Garcia & Associates (Ganda) will be conducting oral history interviews with individuals knowledgeable about the project lands and vicinity, in the ahupua`a of Nu`uanu, Traditional District (moku) of Kona, O`ahu. The oral history interviews are being conducted in order to collect information on possible pre-historic and/or historic cultural resources, as well as traditional cultural practices associated with these lands and access to these resources and practices.

I understand I will be provided the opportunity to review my interview to ensure that it accurately depicts what I meant to say. I also understand that if I don't return the revised transcripts after two weeks from date of receipt, my signature below will indicate my release of information for the draft report. I also understand that I will still have the opportunity to make revisions during the draft review process.

- I am willing to participate.
- I am willing to participate, under the following conditions:

Benjamin Sull 4/20/07

 Consultant Signature Date
BENJAMIN SULLS 225-0727

 Print Name Phone
3659 NUUANU PALI DA.

 Address

MAHALO NUI LOA

V. Confidentiality

Your rights of privacy, confidentiality and/or anonymity will be protected if you so desire. You may request, for example, that your name and/or sex not be mentioned in write-ups, such as field notes, on tape, on files (disk or folders), drafts, reports, and future works; or you may request that some of the information you provide remain "off-the-record" and not be recorded in any way. In order to ensure protection of your privacy, confidentiality and/or anonymity, you should immediately advise the investigator of your desires. The investigator will ask you to specify the method of protection, and note it on this form below.

VI. Refusal/Withdrawal

You may, at any time during the interview process, chose to not participate any further and ask the investigator for the tape and/or notes. Please note that you will be given an opportunity to review your transcript, and to revise or delete any part of the interview.

VII. Waiver

Part I: Agreement to Participate

I, _____, understand that Maria Orr, an independent investigator contracted by Garcia & Associates (Ganda) will be conducting oral history interviews with individuals knowledgeable about the project lands and vicinity, in the ahupua'a of Nu'uuanu, Traditional District (moku) of Kona, O'ahu. The oral history interviews are being conducted in order to collect information on possible pre-historic and/or historic cultural resources, as well as traditional cultural practices associated with these lands and access to these resources and practices.

I understand I will be provided the opportunity to review my interview to ensure that it accurately depicts what I meant to say. I also understand that if I don't return the revised transcripts after two weeks from date of receipt, my signature below will indicate my release of information for the draft report. I also understand that I will still have the opportunity to make revisions during the draft review process.

- I am willing to participate.
_____ I am willing to participate, under the following conditions:

Shannon H. Wilson May 11, 2007
Consultant Signature Date
SHANNON H. WILSON 595-2914
Print Name Phone
51 WOOD ST. HONOLULU 96817
Address

MAHALO NUI LOA

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APPENDIX G: SIGNED RELEASE FORMS

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Part II: Personal Release of Interview Records

I, Ben Sills, have been interviewed by Maria Orr of Kaimipono Consulting Services LLC, an independent investigator contracted by Garcia & Associates (Ganda). I have reviewed the written transcripts of tape recordings of the interview, and agree that said documentation is complete and accurate except for those matters specifically set forth below the heading "CLARIFICATION OR CORRECTIONS."

I further agree that Ms. Orr and Ganda/Environmental Communications may use and release my identity and other interview information, both oral and written, for the purpose of using such information in a report to be made public, subject to my specific objections, to release as set forth below under the heading "SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS."

CLARIFICATION OR CORRECTIONS:

pages 1, 5, 8, 11, 12, 13, 15, 19, 21, 22, 24,
25, 26, 27

SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS:

Especially references to neighbors - their names and other irrelevant information

Benjamin T. Sills

Consultant Signature

5/12/07

Date

BENJAMIN SILLS

Print Name

595 5172

Phone

MAHALO NUI LOA

Part II: Personal Release of Interview Records

I, Shannon Wilson, have been interviewed by Maria Orr of Kaimipono Consulting Services LLC, an independent investigator contracted by Garcia & Associates (Ganda). I have reviewed the written transcripts of tape recordings of the interview, and agree that said documentation is complete and accurate except for those matters specifically set forth below the heading "CLARIFICATION OR CORRECTIONS."

I further agree that Ms. Orr and Ganda/Environmental Communications may use and release my identity and other interview information, both oral and written, for the purpose of using such information in a report to be made public, subject to my specific objections, to release as set forth below under the heading "SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS."

CLARIFICATION OR CORRECTIONS:

as noted on manuscript

SPECIFIC OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS:

<u>Shannon Wilson</u>	<u>2/10/07</u>
Consultant Signature	Date
<u>SHANNON H. WILSON</u>	<u>808 595 2214</u>
Print Name	Phone
<u>81 Wood St. Honolulu</u>	<u>96817</u>
Address	Zipcode

MAHALO NUI LOA

APPENDIX H: SCOPE OF WORK CULTURAL IMPACT ASSESSMENT

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Scope of Work (SOW)
Cultural Impact Assessment
[in accordance with OEQC Guidelines]

- identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua`a;
- identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
- receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
- conduct ethnographic, historical, and other culturally related documentary research;
- identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
- assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Methods

The specific tasks listed below expand on the above scope of work:

- ◆ Conduct historical and cultural background research (i.e., business records, land records; archival documents, literature, reports, letters, photographs, journals, or newspaper files) to locate material that will provide broad patterns of the history of the project area such as subsistence, religious, recreational, and commercial uses of the land; as well as settlement and residential patterns of the area and region; major family groups that inhabited, used or controlled lands within the project area and region; documented legends, myths, or traditional histories associated with the area; and descriptions of traditional practices, customs and beliefs associated with identified traditional cultural practices;
- ◆ Prepare a semi-structured ethnographic research instrument that will include questions that will generate general biographical information, association with and knowledge of the project area, its history and use
- ◆ Prepare a consent form to be used as written agreement with any individual interviewed concerning the review of content and use of information recorded during the interview
- ◆ Identify individuals knowledgeable with the project area e.g., Nu`uanu
- ◆ Conduct and record ethnographic interviews with knowledgeable individuals. If feasible individuals shall participate in field inspections (Makana to be given)
- ◆ Transcribe recorded interviews (Approximate time, 3-4 hrs/per hr of recording)
- ◆ Prepare a report that will include an overview of the archival material, and an analysis of the ethnographic data;