

**CASTLE HILLS ACCESS ROAD
DRAINAGE IMPROVEMENTS
Project No. HWY-O-04-98**

**Application for:
Department of the Army Nationwide Permit**

**State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813**

April 2009

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
Expires December 31, 2004

The public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME State of Hawaii Department of Transportation	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 869 Punchbowl Street Honolulu, Hawaii 96813	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NUMBERS WITH AREA CODE a. Residence Brennon T. Morioka, Director b. Business 587-2150	10. AGENT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE

DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) Castle Hills Access Road Drainage Improvements	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Kapunahala Stream	14. PROJECT STREET ADDRESS (if applicable) Tax Map Keys: 4-5-108: 68-47 and 4-5-108: 2-5
15. LOCATION OF PROJECT Honolulu COUNTY	Hawaii STATE
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) 21°24'13"N by 157°48'36"W to 21°24'13"N by 157°48'34"W, Approximately 197 feet above msl.	

17. DIRECTIONS TO THE SITE
Immediately west of Pookela Street in Kaneohe, Koolaupoko, Oahu, Hawaii

18. Nature of Activity (Description of project, include all features)
see attached

19. Project Purpose (Describe the reason or purpose of the project, see instructions)
see attached

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge
Installation of 60-inch pipe culvert to divert stream flow while a new concrete drop structure outlet with a gabion apron is constructed. Sheet piles and dewatering will be required to construct the new structure.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards
Less than 25 CY of fill #3 rock cushion, geotextile fabric and gabions will be placed within the wetlands.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)
Approximately 165 square feet of gabion apron will be installed with the wetland/stream.

23. Is Any Portion of the Work Already Complete? Yes _____ No ☒ IF YES, DESCRIBE THE COMPLETED WORK

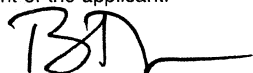
24. Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).
All adjoining properties to Kapunahala Stream have been obtained by the State of Hawaii.

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

*Would include but is not restricted to zoning, building and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.



SIGNATURE OF APPLICANT

4-28-09

DATE

SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals, or covers up any trick scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**Castle Hills Access Road Drainage Improvements
Department of the Army Permit Application**

14. Project Street Address

Address	Tax Map Key	Area (Sq. Ft.) / (Ac.)
45-708 Pilina Way, Kaneohe, HI 96744	4-5-024: 002	5,452 Sq. Ft. / 0.125 Ac.
45-714 Pilina Way, Kaneohe, HI 96744	4-5-024: 003	5,667 Sq. Ft. / 0.130 Ac.
45-720 Pilina Way, Kaneohe, HI 96744	4-5-024: 005	6,145 Sq. Ft. / 0.141 Ac.
45-801 Kupohu Street, Kaneohe, HI 96744	4-5-108: 068	6,106 Sq. Ft. / 0.140 Ac.
45-805 Kupohu Street, Kaneohe, HI 96744	4-5-108: 069	8,146 Sq. Ft. / 0.187 Ac.
45-809 Kupohu Street, Kaneohe, HI 96744	4-5-108: 070	8,391 Sq. Ft. / 0.193 Ac.
45-813 Kupohu Street, Kaneohe, HI 96744	4-5-108: 071	5,940 Sq. Ft. / 0.136 Ac.
45-817 Kupohu Street, Kaneohe, HI 96744	4-5-108: 072	6,353 Sq. Ft. / 0.146 Ac.
45-821 Kupohu Street, Kaneohe, HI 96744	4-5-108: 073	6,629 Sq. Ft. / 0.152 Ac.
45-823 Kupohu Street, Kaneohe, HI 96744	4-5-108: 074	21,559 Sq. Ft. / 0.495 Ac.

17. Directions to the Site

From Honolulu proceed on the H-1 then on the Likelike Highway (63) to Kaneohe. After passing through the Wilson Tunnel, turn onto Kahekili Highway (83). Travel to Kahekili Highway for approximately 0.6 miles heading in the northerly direction. Turn left onto Keaahala Road at the Kaneohe District Park. Make a left turn onto Pookela Street approximately 1000-feet from the intersection at Kahekili Highway. Kupohu Street will be the next left after crossing the Kapunahala Stream.

18. Nature of Activity

The proposed project consists of the replacement of an outlet structure located in Kapunaha Stream, immediately below Pookela Street. The activity will consist of the removal of an existing crm walled riprap structure that will be replaced by a concrete outlet structure and a gabion apron. Less than 25 cubic yards of the gabion apron will be located within the wetland. The concrete outlet structure is located outside of the wetland limits. Approximately 15 linear feet of gabion apron will be located within the wetland.

No historic resources will be affected by the proposed action. While a portion of the project is located within delineated wetlands, no sensitive environmental areas will be affected.

19. Project Purpose

The purpose of the project is to slow steam waters at the proposed drop structure. Appurtenant improvements include the installation of gabion walls outside of the high water mark to stabilize the stream bank adjacent to the outlet structure. Other areas outside of the stream will be graded and grasses as this former residential area was condemned due to unstable soil conditions which endangered the existing residences that will also be removed as part of the project.

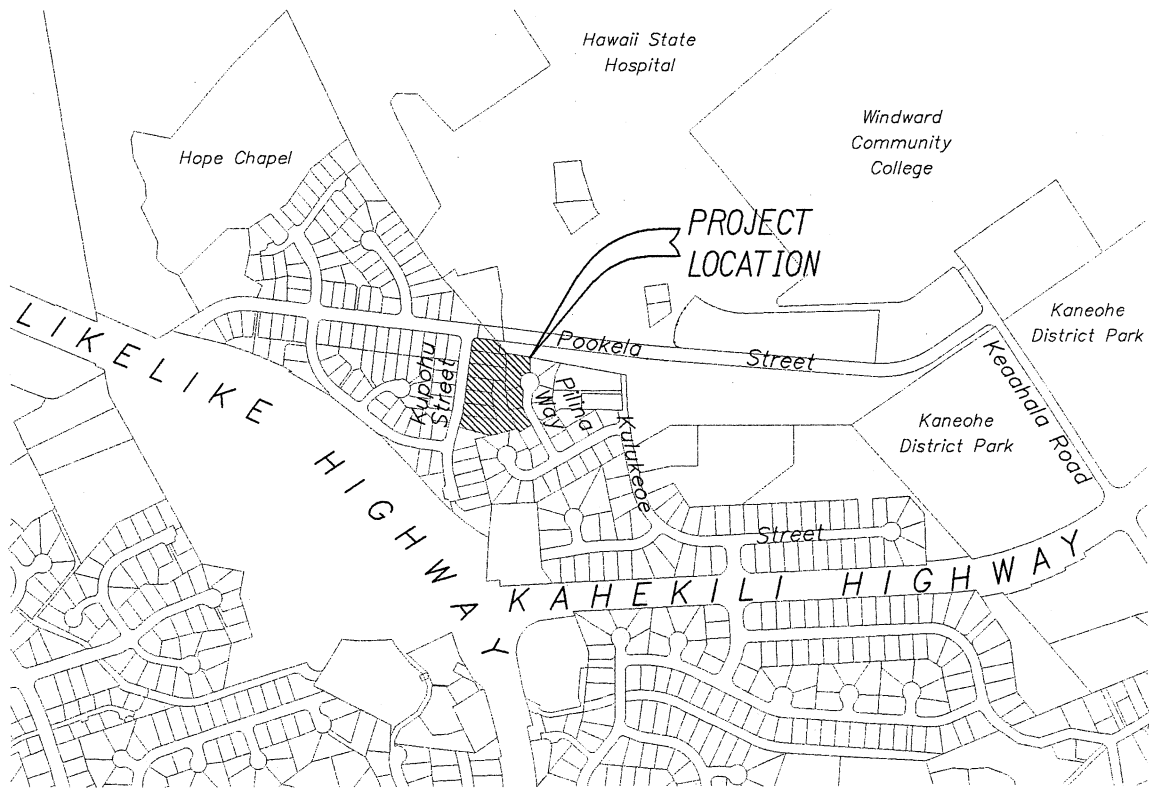
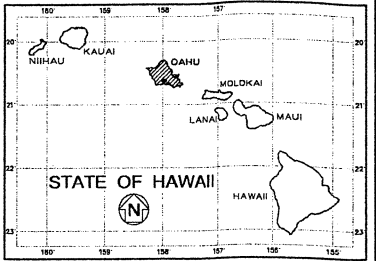
INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	STANDARD PLANS SUMMARY
3-4	CONSTRUCTION NOTES
5-7	WATER POLLUTION, EROSION CONTROL NOTES & DETAILS
8	LEGEND & ABBREVIATIONS
9	EXISTING CONDITIONS
10	EROSION CONTROL PLAN
11	GENERAL LAYOUT PLAN
12-13	DEMOLITION PLAN
14-15	GRADING PLAN
16	PLAN AND PROFILE- NEW DRAINAGE OUTLET
17	TEMPORARY STREAM DIVERSION PLAN
18-19	DETAILS
20-30	STRUCTURAL PLANS
31-33	CROSS SECTIONS

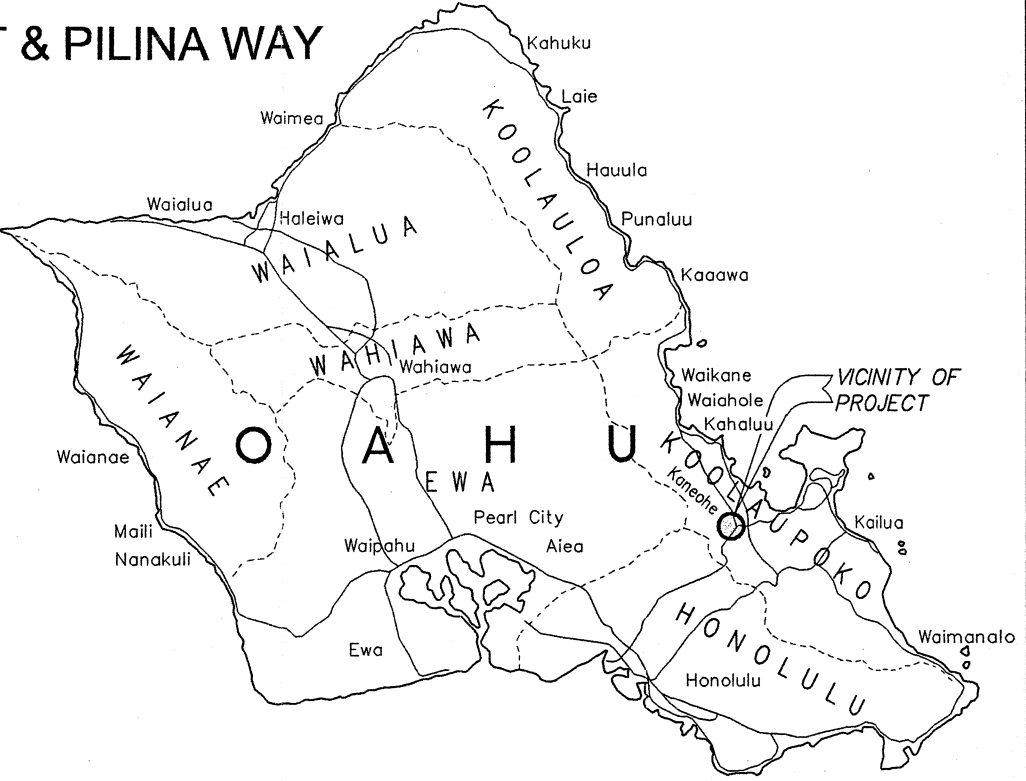
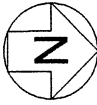
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HONOLULU, HAWAII

PLANS FOR
CASTLE HILLS ACCESS ROAD
DRAINAGE IMPROVEMENTS
VICINITY OF POOKELA STREET, KUPOHU STREET & PILINA WAY
PROJECT NO. HWY-O-04-98
DISTRICT OF KOOLAUPOKO
ISLAND OF OAHU

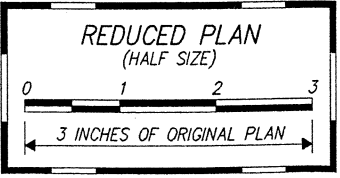
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-98	2009	1	33



400 0 200 400
SCALE IN FEET
LAYOUT PLAN



VICINITY MAP
NOT TO SCALE
4 0 4 8
SCALE IN MILES



DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII
APPROVED:
DIR. OF TRANSPORTATION DATE

DATE	DATE
DESIGNED BY	DRAWN BY
CHECKED BY	TRACED BY
NOTED BY	QUANTITIES BY
NO.	

PAREN, INC. DESIGNED BY
HWY-DS
MANAGED BY
692-7552
PHONE
MARCH 2009
DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	9	33

True North
Scale: 1"=20'

BENCH MARK
C&C STREET MONUMENT
ELEVATION=168.00
(TOP OF BRASS PIN)
FB-2676/30,45

Piliina Way

Stream

Kapunahala

Kupohu Street (Private)

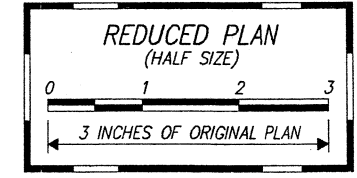
Po'okela Street

(PRIVATE) (STATE)

To Keahala Street

To Puupee Street

BENCH MARK
C&C STREET MONUMENT
(TOP OF BRASS PIN)
ELEVATION=197.48
FB 2676/10



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

APR 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXISTING CONDITIONS

CASTLE HILLS ACCESS ROAD

Drainage Improvements

Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. 1 OF 1 SHEETS

EXISTING CONDITIONS
SCALE: 1"=20'

DATE	REVISION

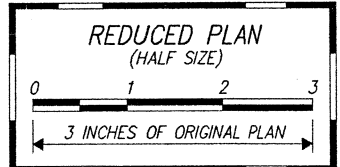
KEY	DATE
ORIGINAL PLAN	
DESIGNED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

Tue, 07 Apr 2009 - 10:06am
D:\Projects\Kanehe\Castle Hills\Design\09-Castle Hills-Existing Conditions.dwg

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	10	33

True North
Scale: 1"=20'

Legend:
 --- Silt Fence
 --- Dust Screen/Silt Fence



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 APRIL 30, 2010
 Lic. Exp. Date
 PerEn, Inc.
 dba PARK ENGINEERING

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EROSION CONTROL PLAN
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009
SHEET No. **EC1** OF **EC1** SHEETS

DATE	REVISION
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BENCH MARK
 C&C STREET MONUMENT
 ELEVATION=168.00
 (TOP OF BRASS PIN)
 FB 2676/30,45

BENCH MARK
 C&C STREET MONUMENT
 (TOP OF BRASS PIN)
 ELEVATION=197.48
 FB 2676/10

EROSION CONTROL PLAN
 SCALE: 1"=20'

To Keahala Street

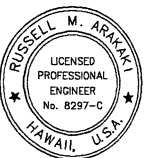
Po'okela Street

(PRIVATE) (STATE)

To Puuope Street

DATE	BY
	DESIGNED BY
	TRACED BY
	NOTE BOOK
	QUANTITIES BY
	CHECKED BY
	No.

Thu, 09 Apr 2009 - 1:36pm
 C:\Projects\Kanehaha\Castle Hills\Design\10-Castles-Erosion Control.dwg



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dba PARK ENGINEERING

SHEET No. C1 OF C1 SHEETS

DATE	REVISION
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	12	33

Legend:

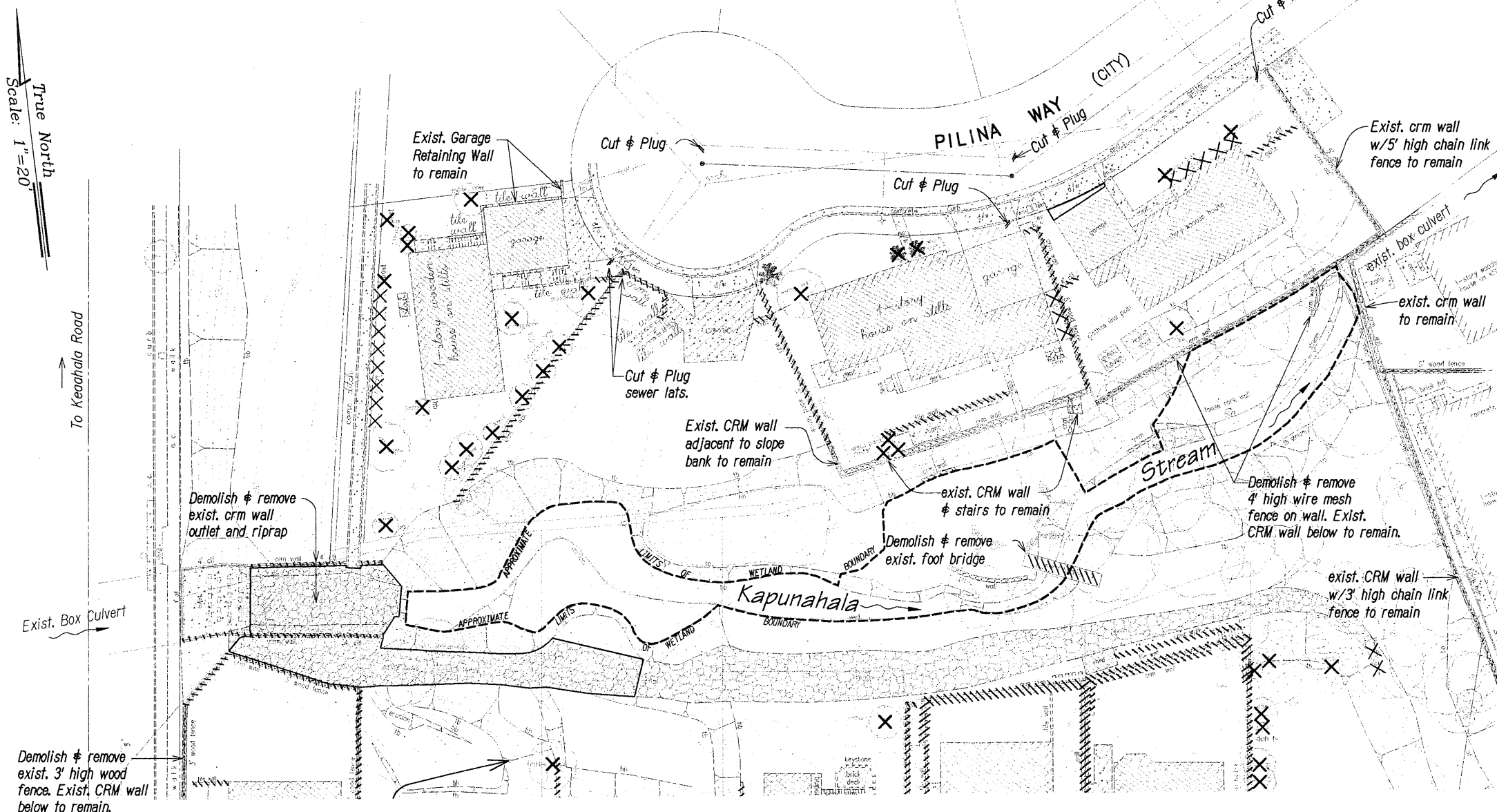
- Existing structure to be demolished and removed.
- Existing pavement to be demolished and removed.
- Existing crm wall to be demolished and removed, including fencing where applicable.
- Existing cmu wall to be demolished and removed, including fencing where applicable.
- Existing foot bridge to be demolished and removed.
- Existing hedge to be demolished and removed.
- Existing tree to be demolished and removed.
- Existing tree to be demolished and removed.
- Existing tree to be demolished and removed.

General Demolition Notes:

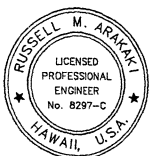
- The Contractor shall verify existing conditions prior to bidding. Any discrepancies shall be brought to the attention of Engineer for clarification.
- The Contractor shall bring any conflicts and/or questions to the attention of the Engineer prior to the start of demolition. Any remedial work resulting from the Contractor's failure to do so shall be paid by the Contractor at no cost to the State. All restoration work shall be paid for by the Contractor.
- 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 State.
- Backfill and compact all voids and depressions caused by demolition operations.
- The Contractor shall properly remove and dispose offsite of all demolition materials at no additional cost to the State.
- After completion of the demolition work, the Contractor shall clean the project limits of all demolished materials, rubbish and all other debris which shall then be transported to a legal offsite disposal site.
- All temporary erosion control measures shall be installed prior to demolition work as shown on the erosion control plan, dwg.
- Existing utility lines shown are based on best available as-built drawings on file with the City and County of Honolulu.
- Prior to excavation near or around the existing utilities, the Contractor shall restrain all existing pipes, water valves, concrete block, concrete jackets, etc., as required to ensure the existing utilities are not disturbed.

Notes:

- Contractor to cut and plug existing unused water laterals at the main. Meter and valve boxes shall be demolished and removed. The damaged areas shall be repaired to an equal or better condition than the surrounding area.
- Contractor to cut and plug existing unused sewer laterals at the property line. Existing sewer cleanouts, whether or not shown on the plans shall be demolished and removed. The existing holes shall be backfilled and compacted with aggregate based course.
- Contractor to locate, cap, cut and plug, and abandon all existing unused electric telephone and cable conduits at the property line after removal of conductors.
- Salvage clean and reuse rock for the new CRM Walls and grouted riprap paving (grp) slope protection.

**DEMOLITION PLAN - NORTH OF STREAM**

SCALE: 1"=20'



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








PerEx, Inc. APRIL 30, 2010
dbs PARK ENGINEERING LIC. EXP. DATE

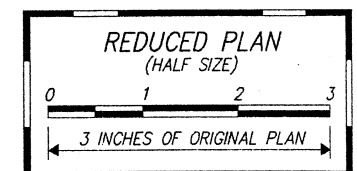
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DEMOLITION PLAN
NORTH OF STREAM
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. DP1 OF DP2 SHEETS

DATE REVISION

	Existing structure to be demolished and removed.
	Existing pavement to be demolished and removed.
	Existing crm wall to be demolished and removed, including fencing where applicable.
	Existing cmu wall to be demolished and removed, including fencing where applicable.
	Existing foot bridge to be demolished and removed
	Existing hedge to be demolished and removed.
	Existing tree to be demolished and removed.
	Existing tree to be demolished and removed.
	Existing tree to be demolished and removed.



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APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DEMOLITION PLAN
SOUTH OF STREAM
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. *DP2* OF *DP2* SHEETS

13

True North
Scale: 1"=20'

Existing CRM Outlet Wall &
RipRap to be demolished &
Reconstructed

Exist. CRM wall -
adjacent to slope
bank to remain

Exist. CRM wall
 & stairs to remain
 h & remove
 foot bridge

Exist. CRM wall
to remain. Demolish
& remove 4-ft. high
wire mesh fence on
top of wall

Exist. CRM wall
w/3' high chain
fence to remain

Exist. CRM Wall ———
to remain. Demolish &
remove 3-ft. high wood
fence on top of wall

	STREET
PO'OKELA	(PRIVATE)
	(STATE)
	(PUBLIC)

KUPOHU STREET (PRIVATE)

DEMOLITION PLAN - SOUTH OF STREAM

SCALE: 1"=20'

Contractor to locate
sewer lateral and
Cut & Plug @
property line

Contractor to locate
sewer lateral and
Cut & Plug @
property line

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	WN BY	"
	ED BY	"
	SIGNED BY	"
	QUANTITIES BY	"
	CHECKED BY	"
No. _____		

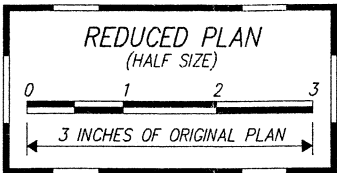
DATE _____

REVISION

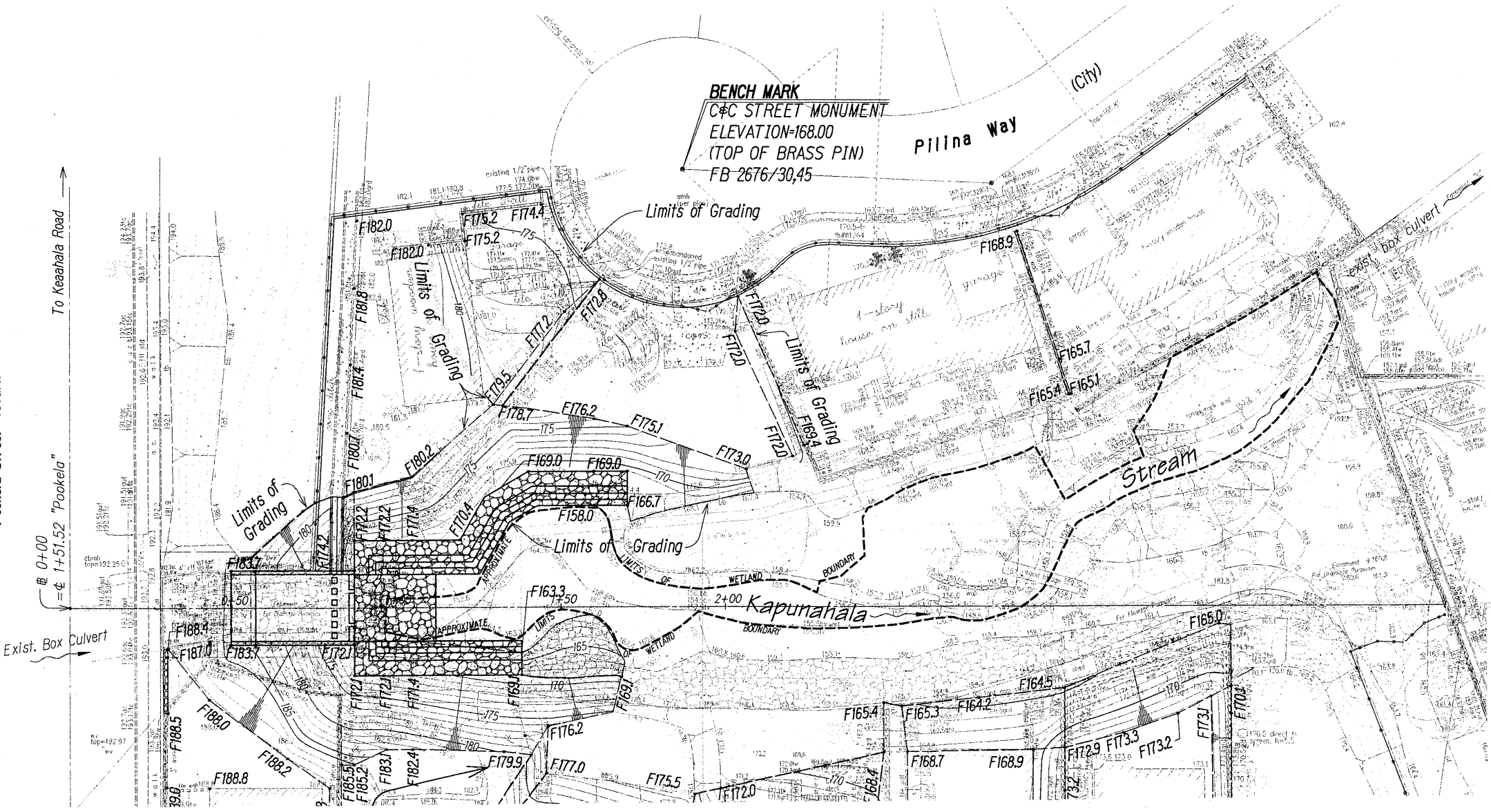
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	14	33

Legend:

- 180 — Finish 5-ft Contour
- — — Finish 1-ft Contour
- - - - - Existing 5-ft Contour
- - - - - Existing 1-ft Contour
- Limits of Grading
- F179.9 Finish Grade Elevation
- 182.0 Existing Ground Elevation
- Grade Bank



True North
Scale: 1"=20'



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APRIL 30, 2010
LIC. EXP. DATE

GRADING PLAN - NORTH OF STREAM
SCALE: 1"=20'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GRADING PLAN
NORTH OF STREAM
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009
SHEET No. GPI OF GP2 SHEETS

DATE	REVISION
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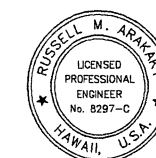
The diagram illustrates a road cross-section with the following elements from top to bottom:

- A horizontal line representing the **Finish 5-ft Contour**, with a distance of **180** feet indicated on the left.
- A horizontal line representing the **Finish 1-ft Contour**.
- A horizontal line representing the **Existing 5-ft Contour**.
- A horizontal line representing the **Existing 1-ft Contour**.
- A horizontal line representing the **Limits of Grading**.
- A horizontal line representing the **Finish Grade Elevation**, with a value of **F79.9** indicated on the left.
- A horizontal line representing the **Existing Ground Elevation**, with a value of **182.0** indicated on the left.
- A cross-section of a **Grade Bank** at the bottom.

REDUCED PLAN
(HALF SIZE)

0 1 2 3

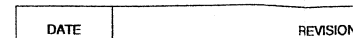
3 INCHES OF ORIGINAL PLAN



APRIL 30, 2010
LIC. EXP. DATE

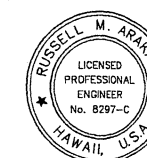
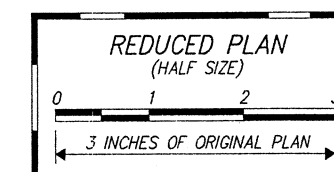
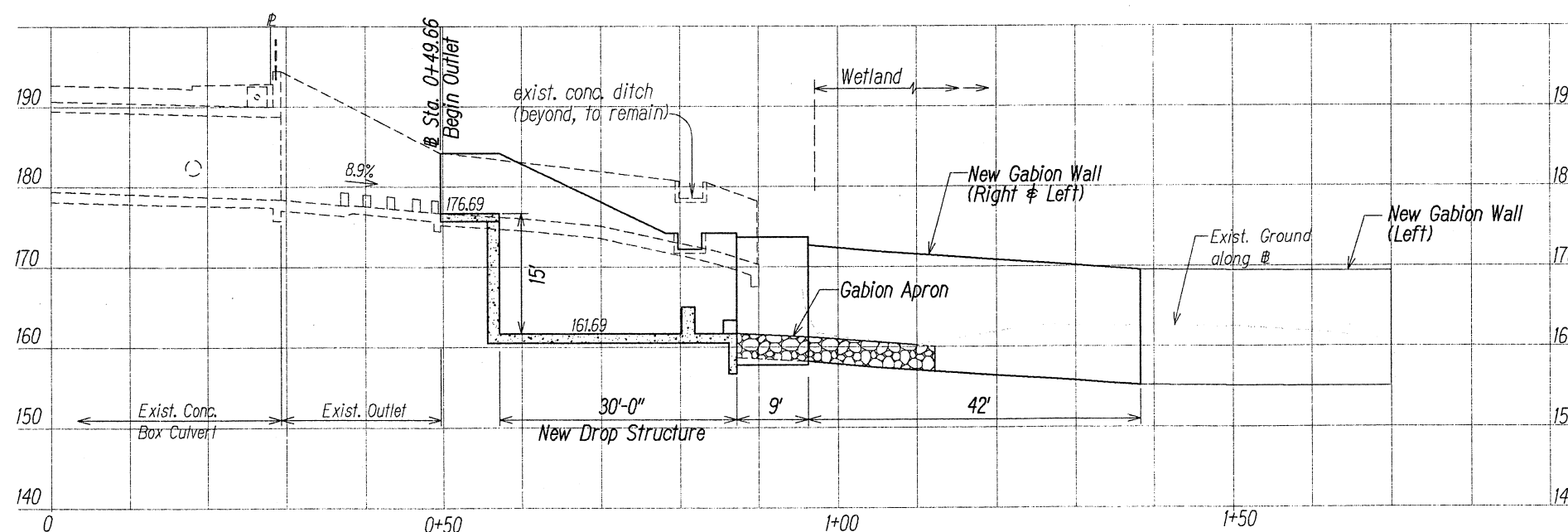
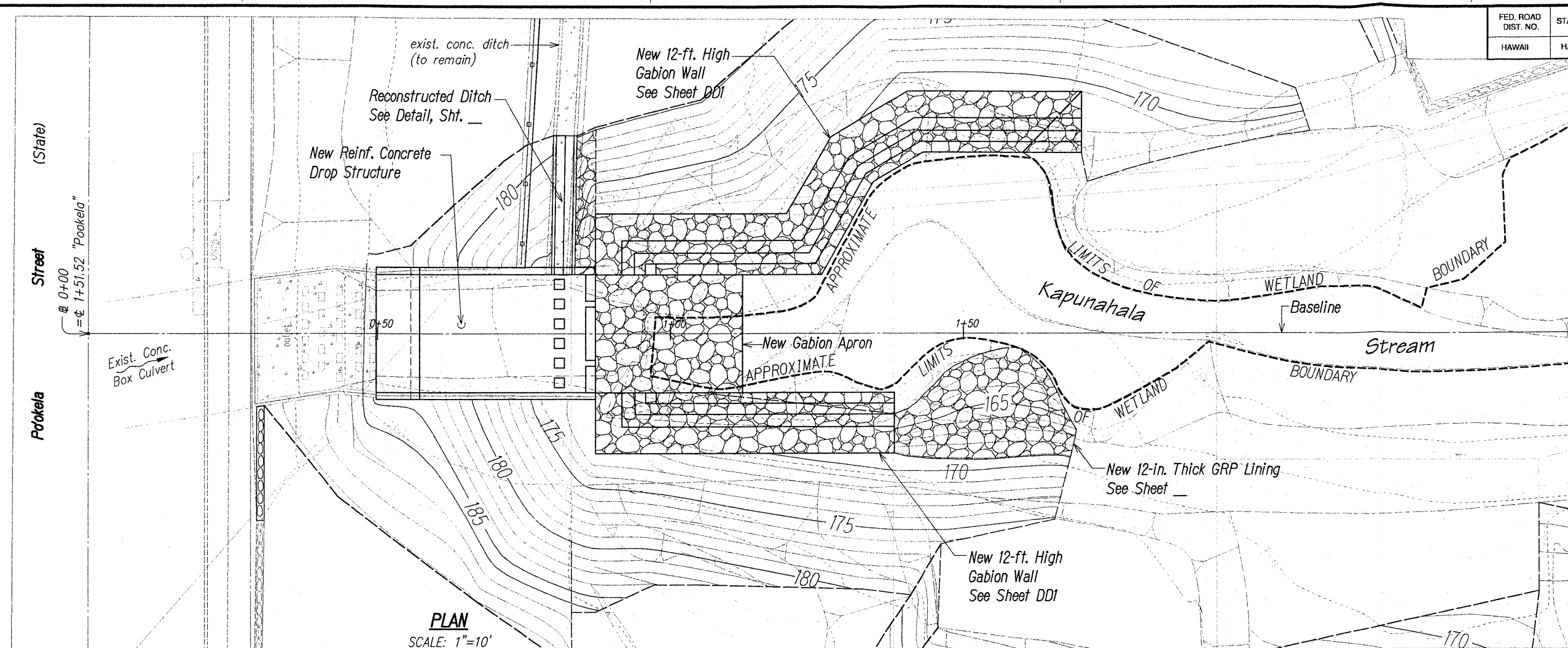
Scale: As Shown Date: March 2009

SHEET No. GP2 OF GP2 SHEETS



15

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	16	33



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OR UNDER MY SUPERVISION.

ParEn, Inc.
dba PARK ENGINEER

APRIL 30, 20
LIC. EXP. DA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PLAN AND PROFILE
NEW DRAINAGE OUTLET
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. D1 OF D2 SHEETS

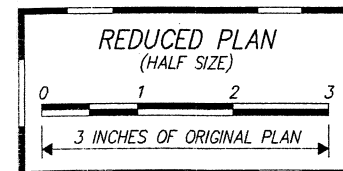
14



1. *Install temporary silt fence at gabion outlet, along stream, stream bank, exist. crm and concrete walls, and concrete ditch.*
2. *Construct temporary gabion outlet.*
3. *Install 60" bypass/diversion drain from temporary gabion outlet to exist. concrete wall.*
4. *Remove temporary silt fence at gabion outlet and divert runoff from concrete lined ditch into the 60" bypass/diversion pipe.*
5. *Install sand bag cofferdam at existing concrete wall for connection of the 60" bypass/diversion pipe.*
6. *Demolish exist. concrete headwall as required for connection of the 60" bypass/diversion pipe.*
7. *Connect the 60" bypass/diversion pipe to exist. concrete headwall.*
8. *Remove temporary sand bag cofferdam at exist. conc. headwall.*
9. *Install temporary sand bag cofferdam for construction of the temporary concrete diversion wall and divert stream to 60" pipe.*
10. *Construct temporary concrete diversion wall.*
11. *Remove sand bag cofferdam at temporary concrete diversion wall and divert the flow into the 60" bypass/diversion pipe.*
12. *Install temporary erosion control matting over trench backfill and other disturbed areas, then hydromulch, grass and stabilize disturbed areas.*

PLAN - TEMPORARY BYPASS/DIVERSION DRAIN

SCALE: 1"=10'



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EXP. DATE

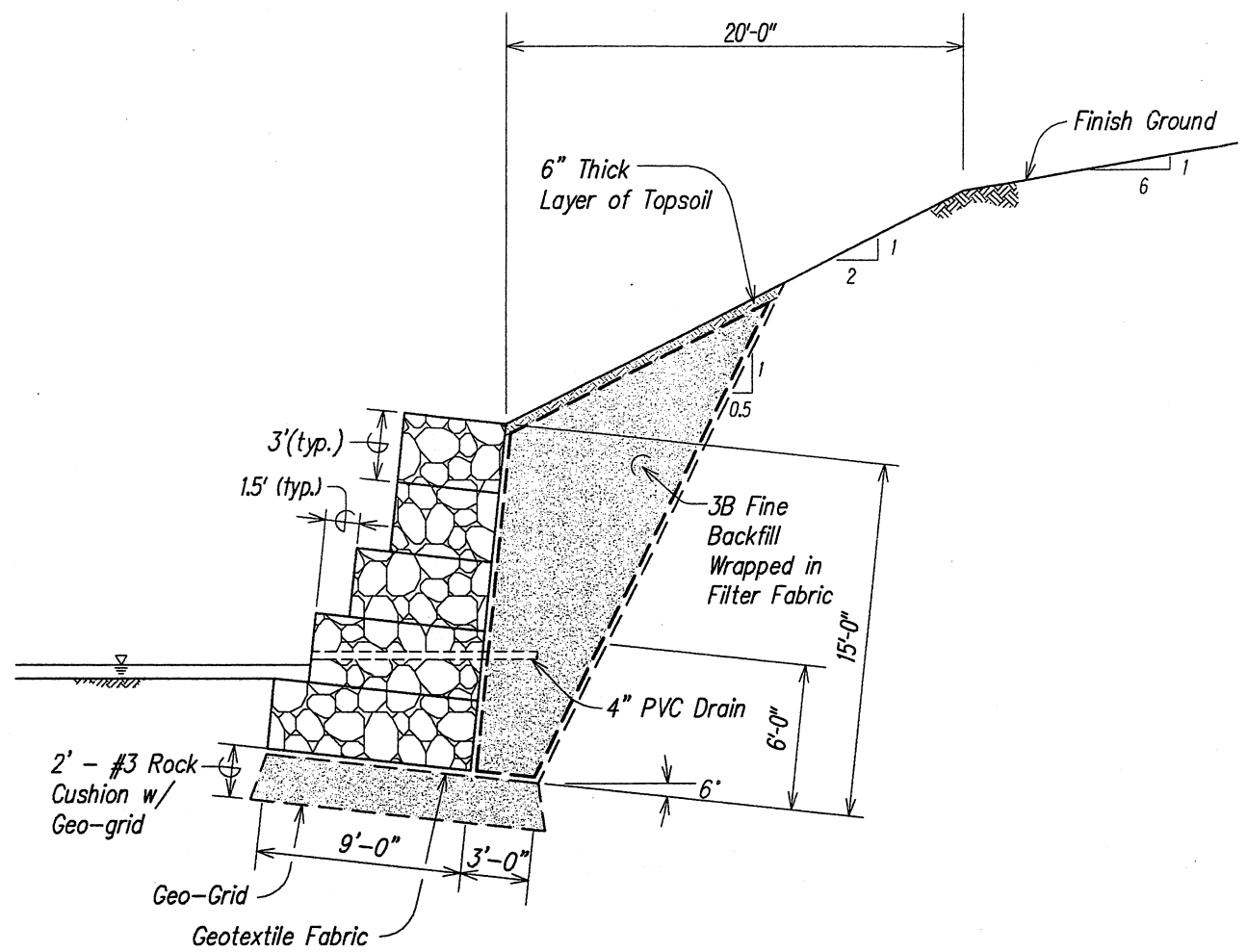
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TEMPORARY STREAM
DIVERSION PLAN
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

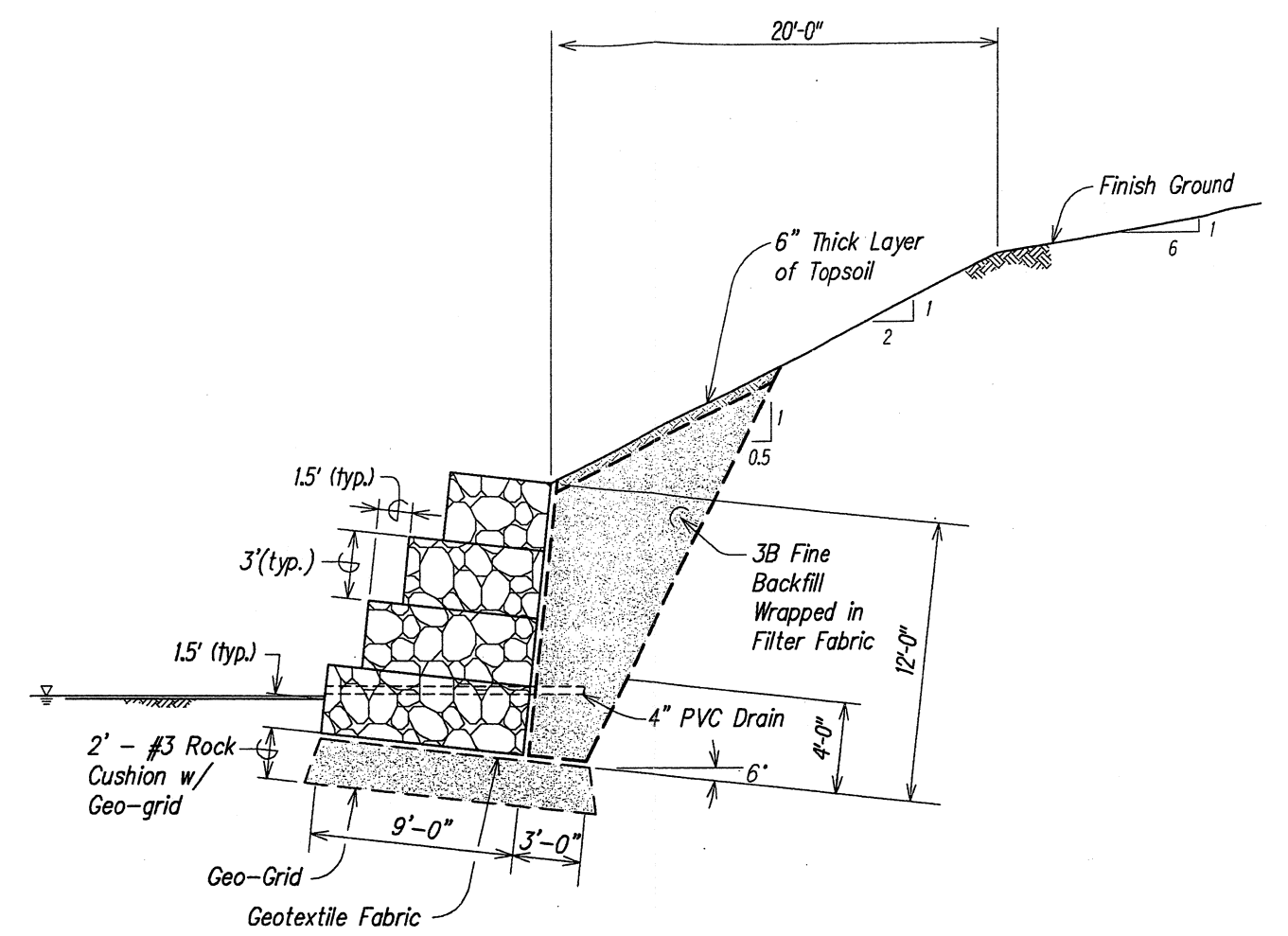
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DATE _____ REVISION _____

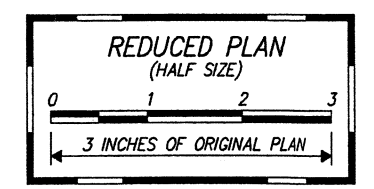
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	18	33



15-FT HIGH GABION WALL SECTION (TYPICAL)
SCALE: 1/4" = 1'-0"



12-FT HIGH GABION WALL SECTION (TYPICAL)
SCALE: 1/4" = 1'-0"



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS

CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

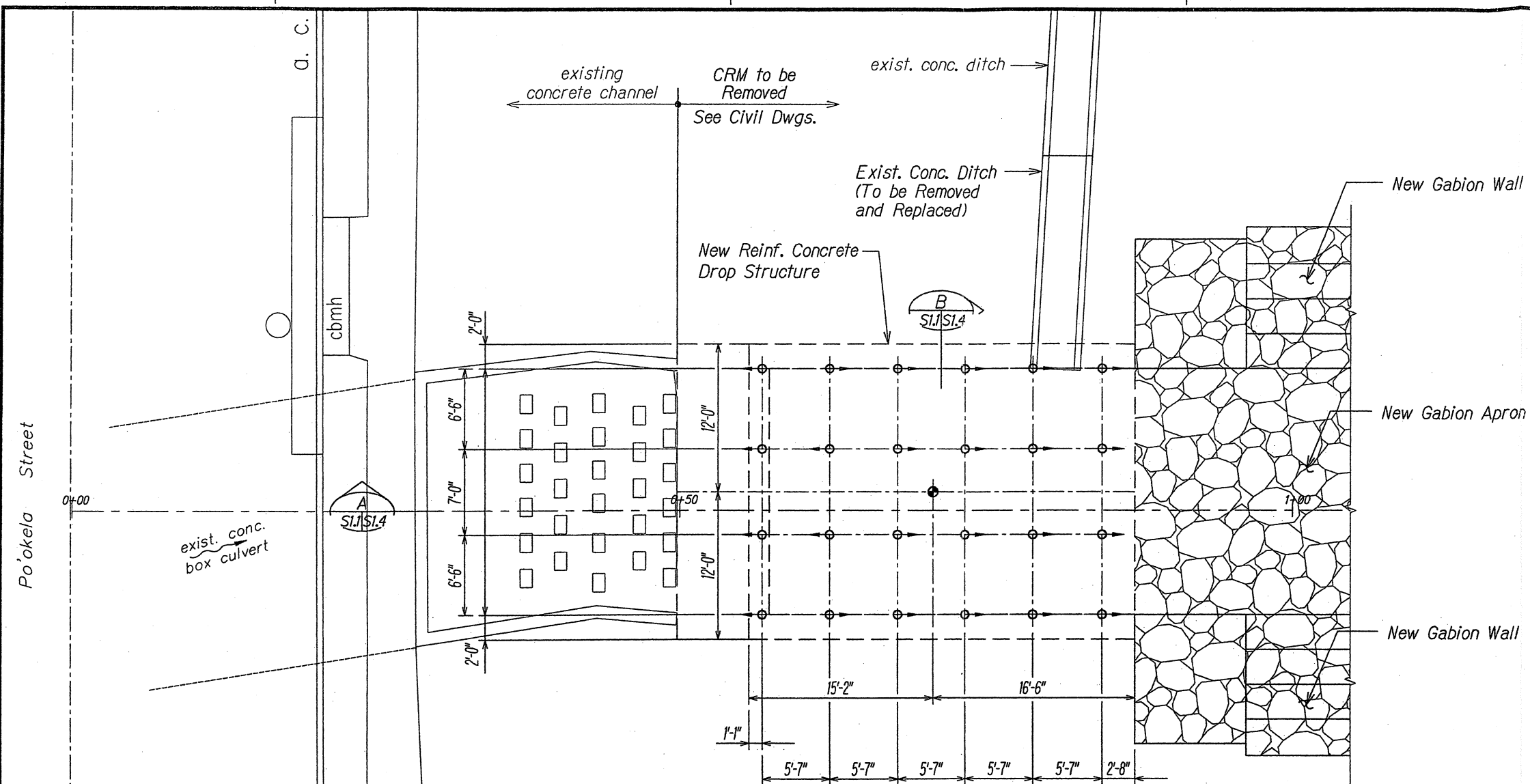
SHEET No. DD1 OF DD2 SHEETS

DATE	REVISION
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ORIGIN	DATE
PLAN	DATE
DESIGNED BY	DATE
CHECKED BY	DATE
NO. 1	
NO. 2	
NO. 3	
NO. 4	
NO. 5	
NO. 6	
NO. 7	
NO. 8	
NO. 9	
NO. 10	

Wed, 18 Mar 2009 - 10:15am
D:\PROJECTS\CASTLE HILLS ACCESS ROAD\18-Cashills-DETAILS1.dwg

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



LEGEND:

- ➔ Direction of Battered Micropile (1H:8V)
 ● Preproduction Micropile

MICROPILE LAYOUT PLAN

Scale: $3/16'' = 1'-0''$

ORIGINAL	BY PLOTTED BY	DATE
PLAN	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

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KSF, INC.	APRIL 30, 2010 LIC. EXP. DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MICROPILE LAYOUT PLAN

CASTLE HILLS ACCESS ROAD

Drainage Improvements

Project No. HWY-0-04-98

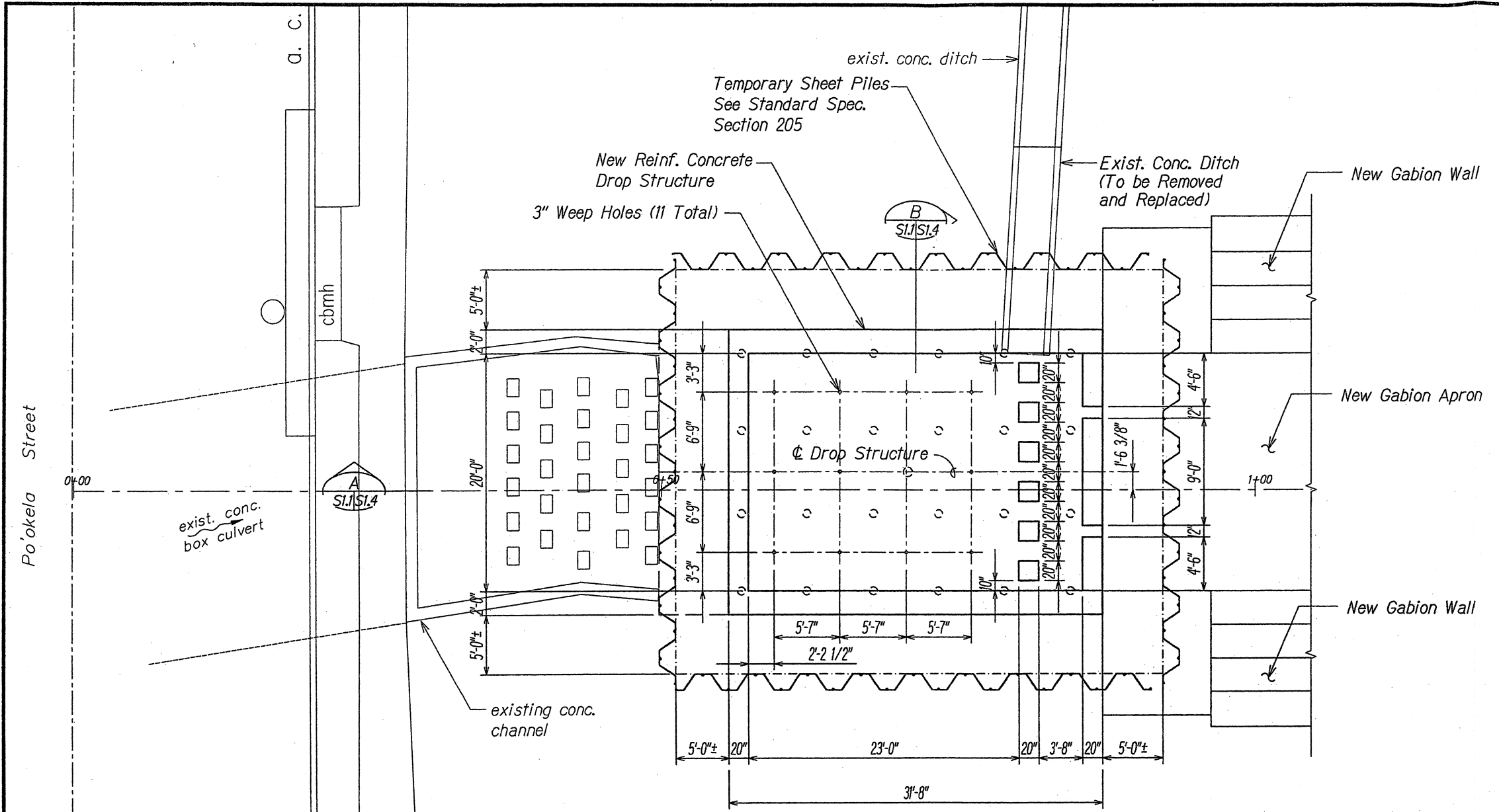
Scale: As Shown

Date: March 2009

SHEET No. 511 OF 11 SHEETS

DATE	REVISION
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



DROP STRUCTURE PLAN
Scale: 3/16" = 1'-0"

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
NO.	_____

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STATE OF HAWAII
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HIGHWAYS DIVISION

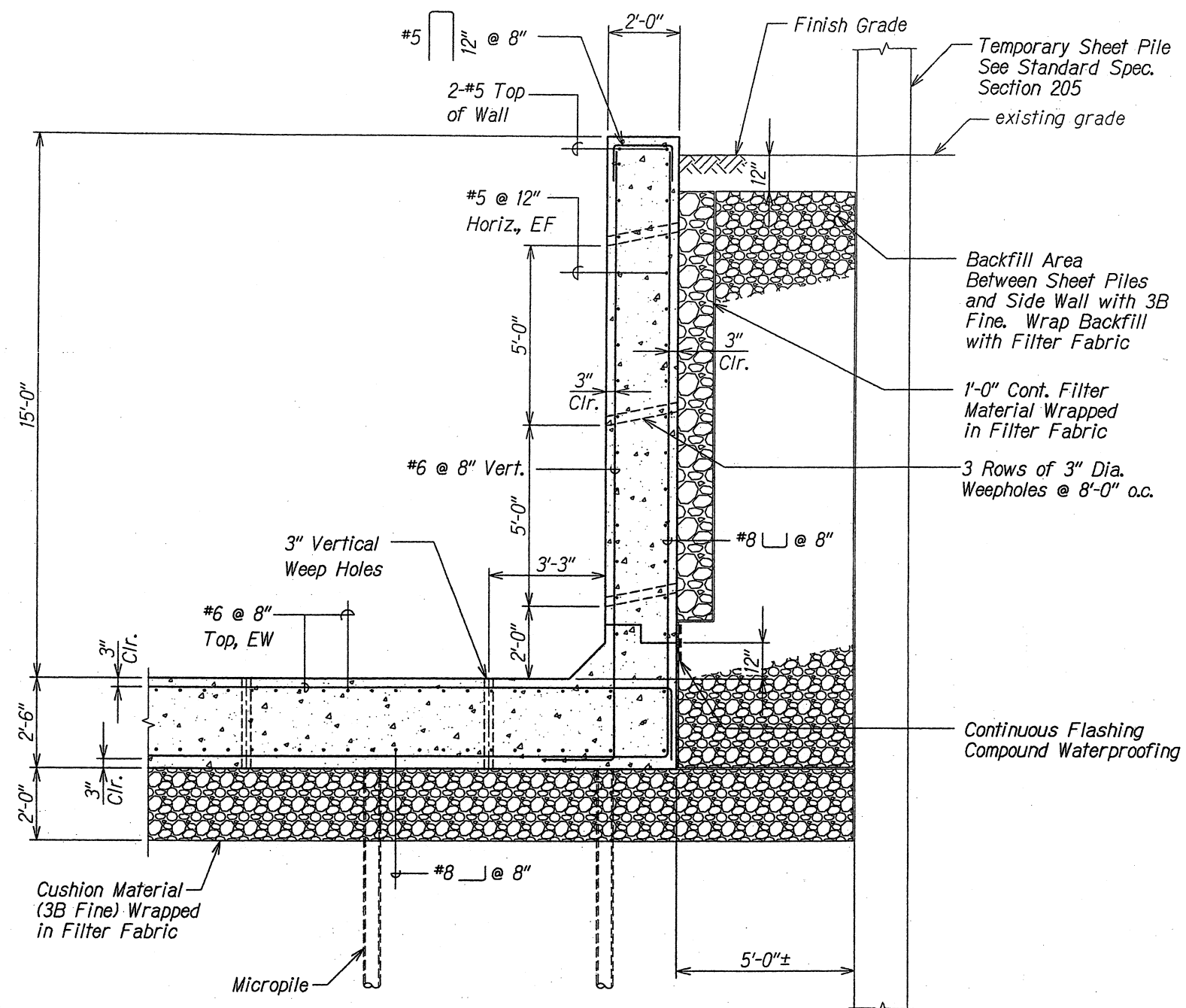
DROP STRUCTURE PLAN
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. **SI.2** OF **11** SHEETS

DATE	REVISION

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



DROP STRUCTURE SECTION
Scale: 1/2" = 1'-0"
A
S1.4 S2.1

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STATE OF HAWAII
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HIGHWAYS DIVISION

HEAD WALL SECTION

CASTLE HILLS ACCESS ROAD

Drainage Improvements

Project No. HWY-0-04-98

Scale: As Shown

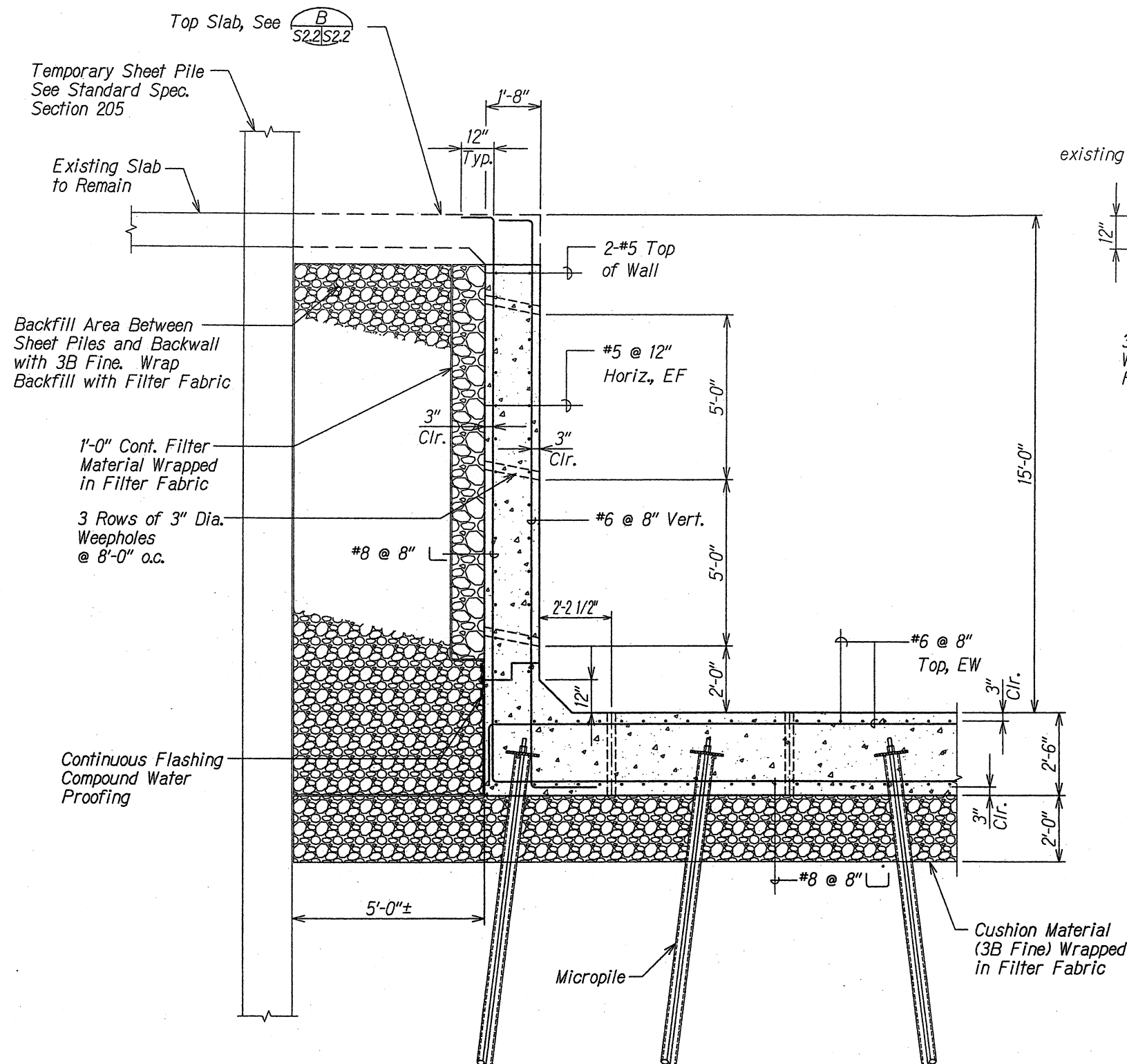
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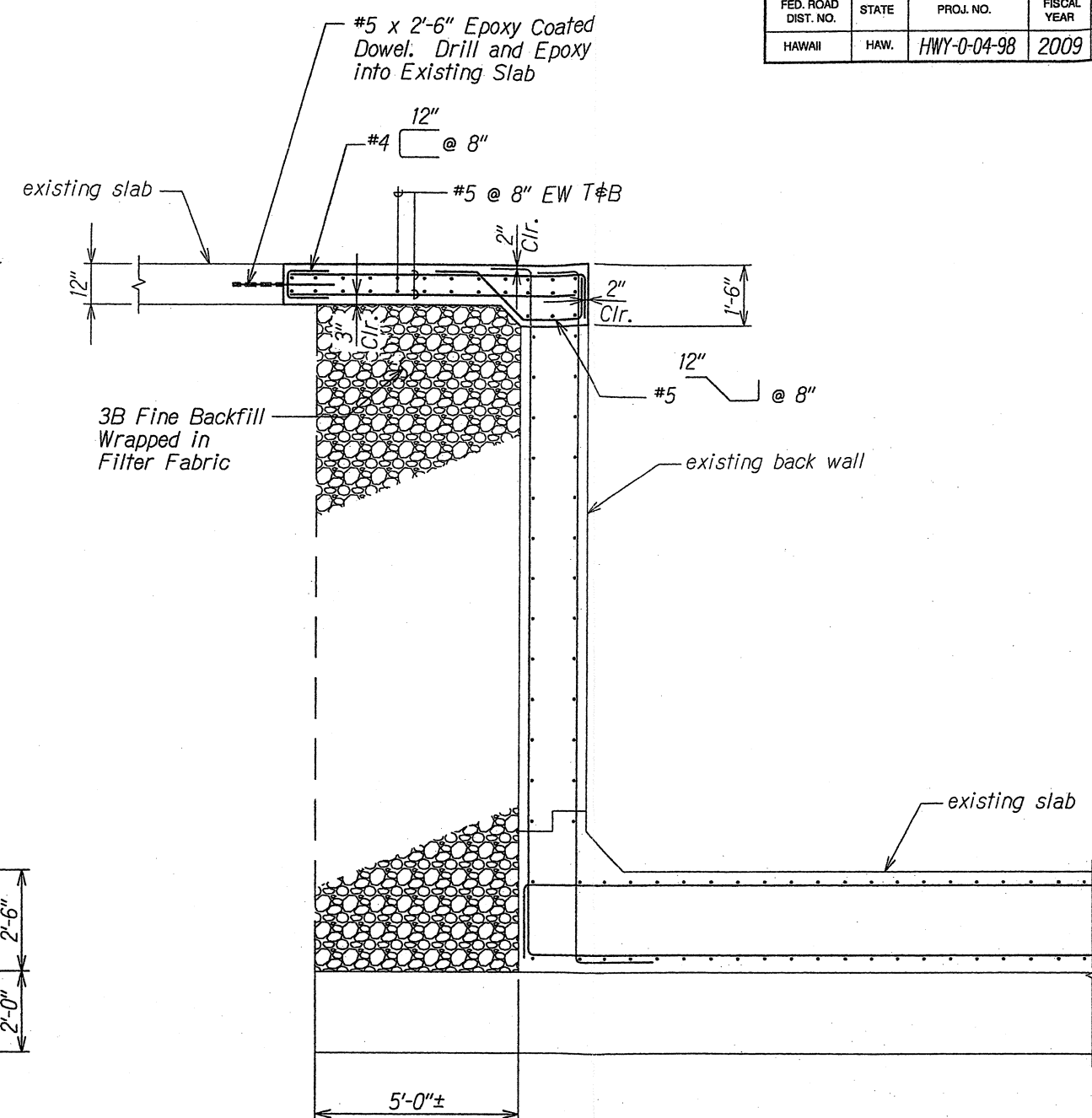
DATE REVISION

DESIGNED BY	DATE
CHECKED BY	
NOTES BOOK	
QUANTITIES BY	
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



DROP STRUCTURE
BACK WALL SECTION A
Scale: 1/2" = 1'-0" S1.4 S22



DROP STRUCTURE
TOP SLAB SECTION B
Scale: 1/2" = 1'-0" S22 S22

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DROP STRUCTURE SECTIONS

CASTLE HILLS ACCESS ROAD

Drainage Improvements

Project No. HWY-0-04-98

Scale: As Shown

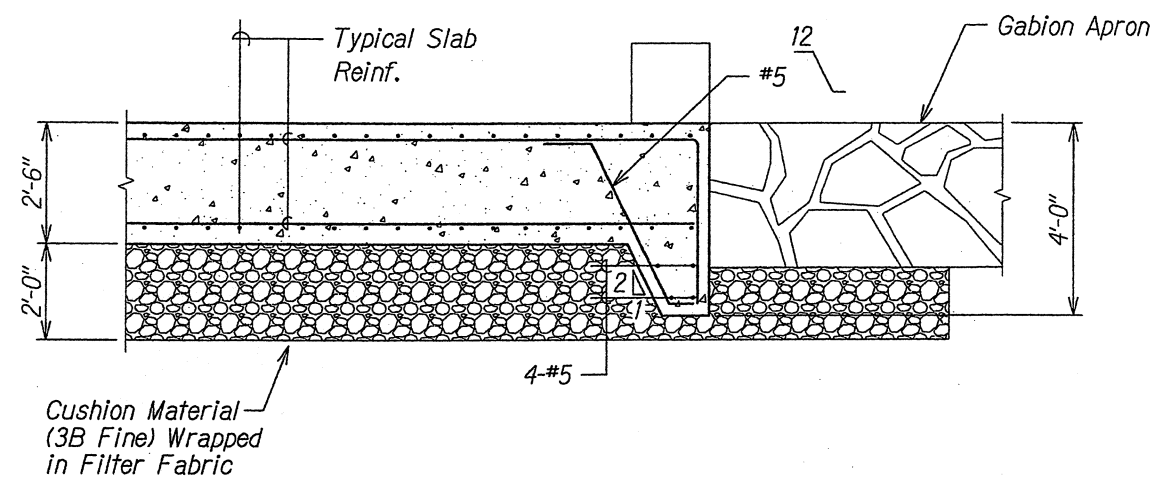
Date: March 2009

SHEET No. S22 OF 11 SHEETS

DATE REVISION

ORIGIN	DATE
PLAN	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



DROP STRUCTURE
CUTOFF WALL SECTION

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



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DROP STRUCTURE SECTION

CASTLE HILLS ACCESS ROAD

Drainage Improvements

Project No. HWY-0-04-98

Scale: As Shown

Date: March 2009

SHEET No. S2.3 OF 11 SHEETS

DATE

REVISION

ORIGINAL PLAN	BY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

MICROPILE NOTES:

- All nuts and bar couplings shall develop 100% of the bar's ultimate tensile strength.
- Splices within steel casing shall develop 100% of the steel casing's ultimate tensile strength.
- All accessories such as nuts, couplings, washers, and steel plates shall be hot-dip galvanized according to ASTM A-153.
- Material Properties of Accessories:
 - Steel Plates - ASTM A36
 - Hex Nuts - ASTM A108
 - Couplings - ASTM A108
 - Washers - ASTM F436
- The bonded length is estimated. The actual bonded length will be determined by the Engineer after the preproduction micropile load test.

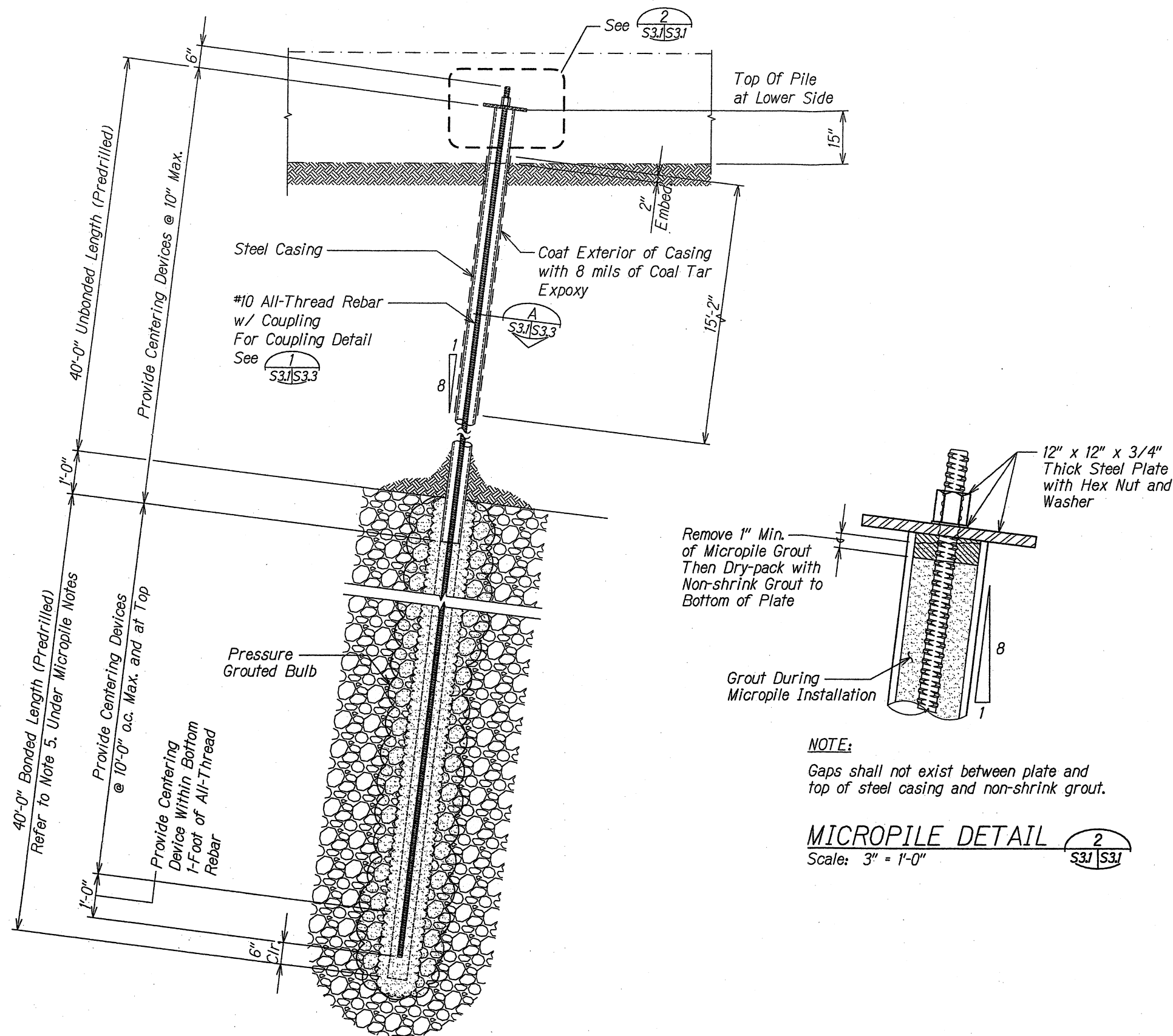
Micropile Load Combination (Demand)		
	Axial Load (kips)	Moment (k-ft)
Strength Limit State	80 Compression	50
Strength Limit State	50 Tension	50

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STATE OF HAWAII
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HIGHWAYS DIVISION

MICROPILE DETAIL AND SECTION
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98
Scale: As Shown Date: March 2009
SHEET No. S3J OF 11 SHEETS



NOTE:

Gaps shall not exist between plate and top of steel casing and non-shrink grout.

MICROPILE DETAIL

Scale: 3" = 1'-0"

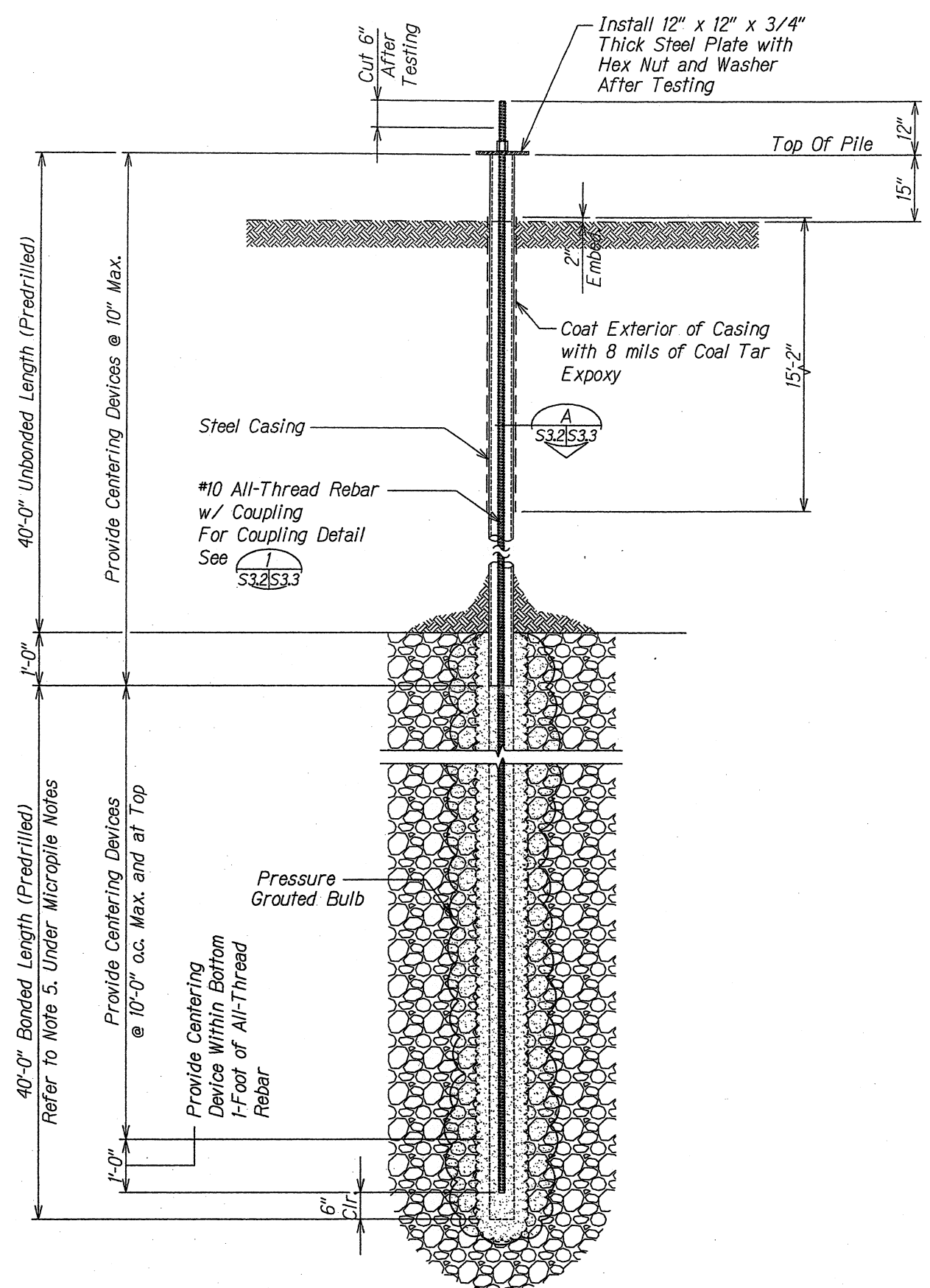
DATE	
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CHECKED BY	
NOTED BY	
NO.	

TYPICAL MICROPILE DETAIL

Scale: 3/4" = 1'-0"

DATE	REVISION

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



TYPICAL PREPRODUCTION MICROPILE DETAIL
 Scale: 3/4" = 1'-0" 1
S3.2 | S3.2

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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PREPRODUCTION MICROPILE DETAIL

CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

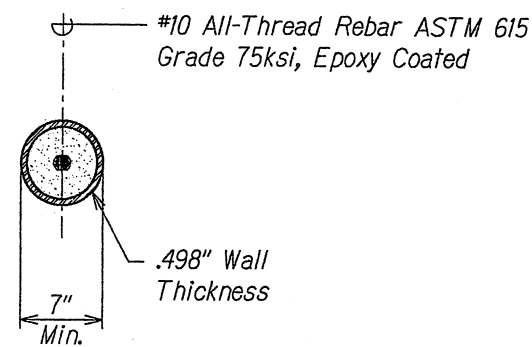
Scale: As Shown Date: March 2009

SHEET No. S3.2 OF 11 SHEETS

DESIGNED BY	DATE
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NO. _____	

DATE	REVISION

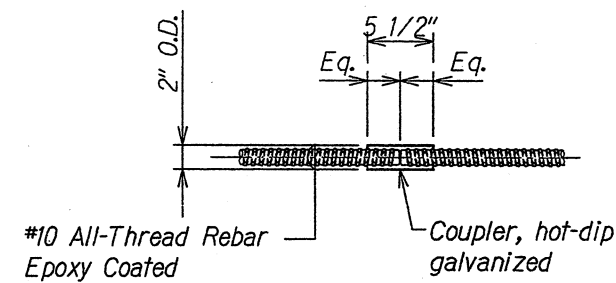
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	00	X



- NOTES:**
1. Centering devices (centralizers) shall be fabricated from plastic or material non-detrimental to the reinforcing steel.
 2. The centralizer shall support the reinforcing such that a minimum of 2" of grout cover is provided and shall permit grout to flow freely up the drill hole.

TYPICAL MICROPILE SECTION
Scale: 1 1/2" = 1'-0"

A
S3.1 S3.3



NOTE:
Coupler to develop full ultimate tensile strength of All-Thread Rebar.

COUPLER DETAIL OF ALL-THREAD REBAR
Scale: 1 1/2" = 1'-0"

1
S3.1 S3.3

COUPLER INSTALLATION PROCEDURE

1. Apply corrosion inhibiting grease to the bare ends of the bars and the inside of the coupler.
2. Connect the two bar ends with the coupler. Each end shall be screwed into the coupler half the length of the coupler.
3. Add another coat of grease to bare bar and coupler and wrap with two layers of denso tape.

PREPARATION FOR FIELD CUT BARS

1. Cut corrosion protection and all-thread rebar with an abrasive saw (DO NOT USE A TORCH).

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HIGHWAYS DIVISION

MICROPILE DETAIL AND SECTION

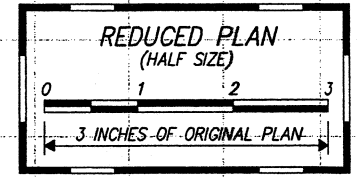
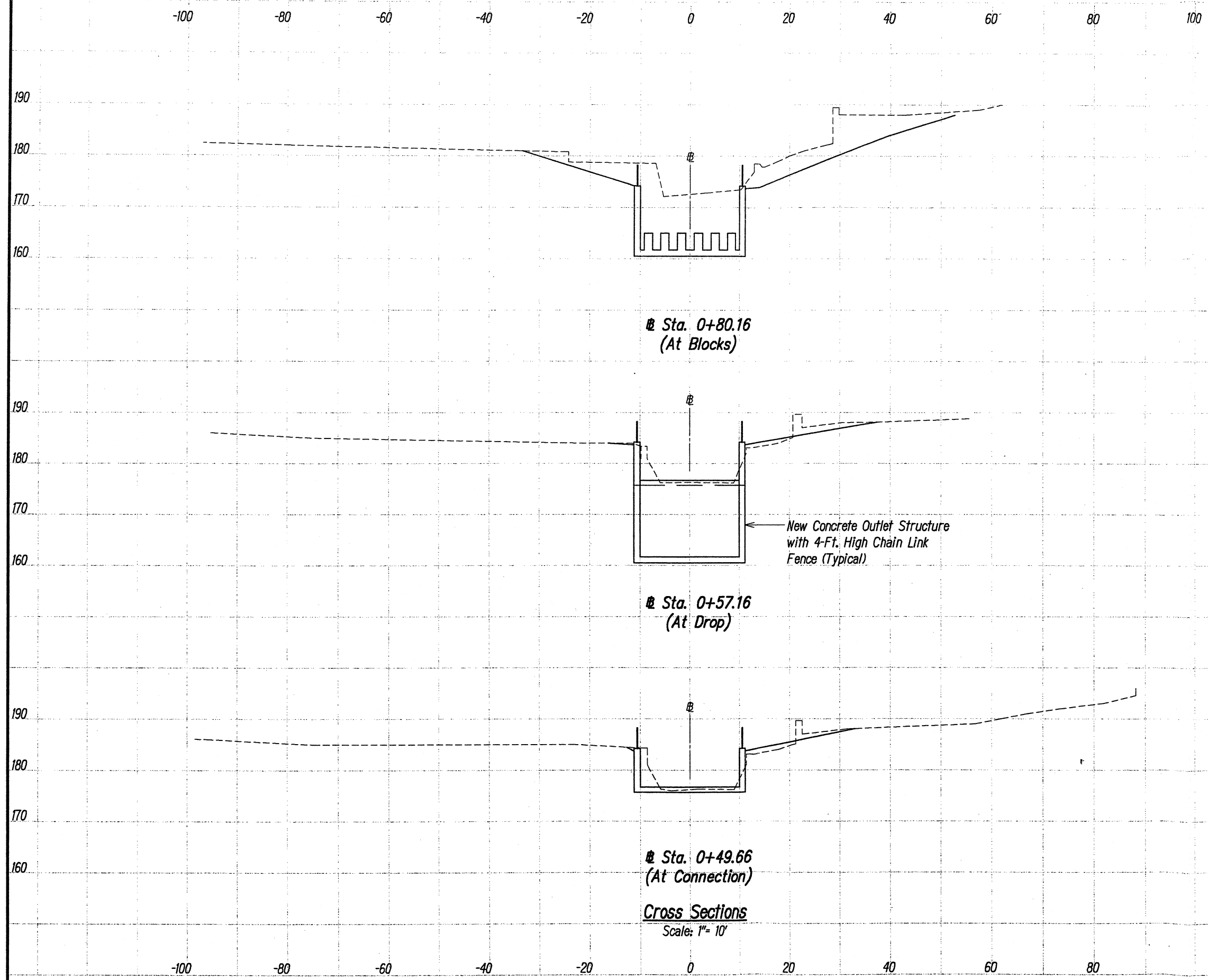
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. S3.3 OF 11 SHEETS

DATE REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	31	33



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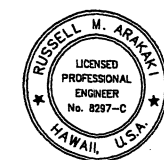
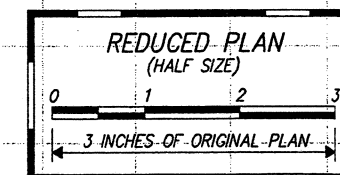
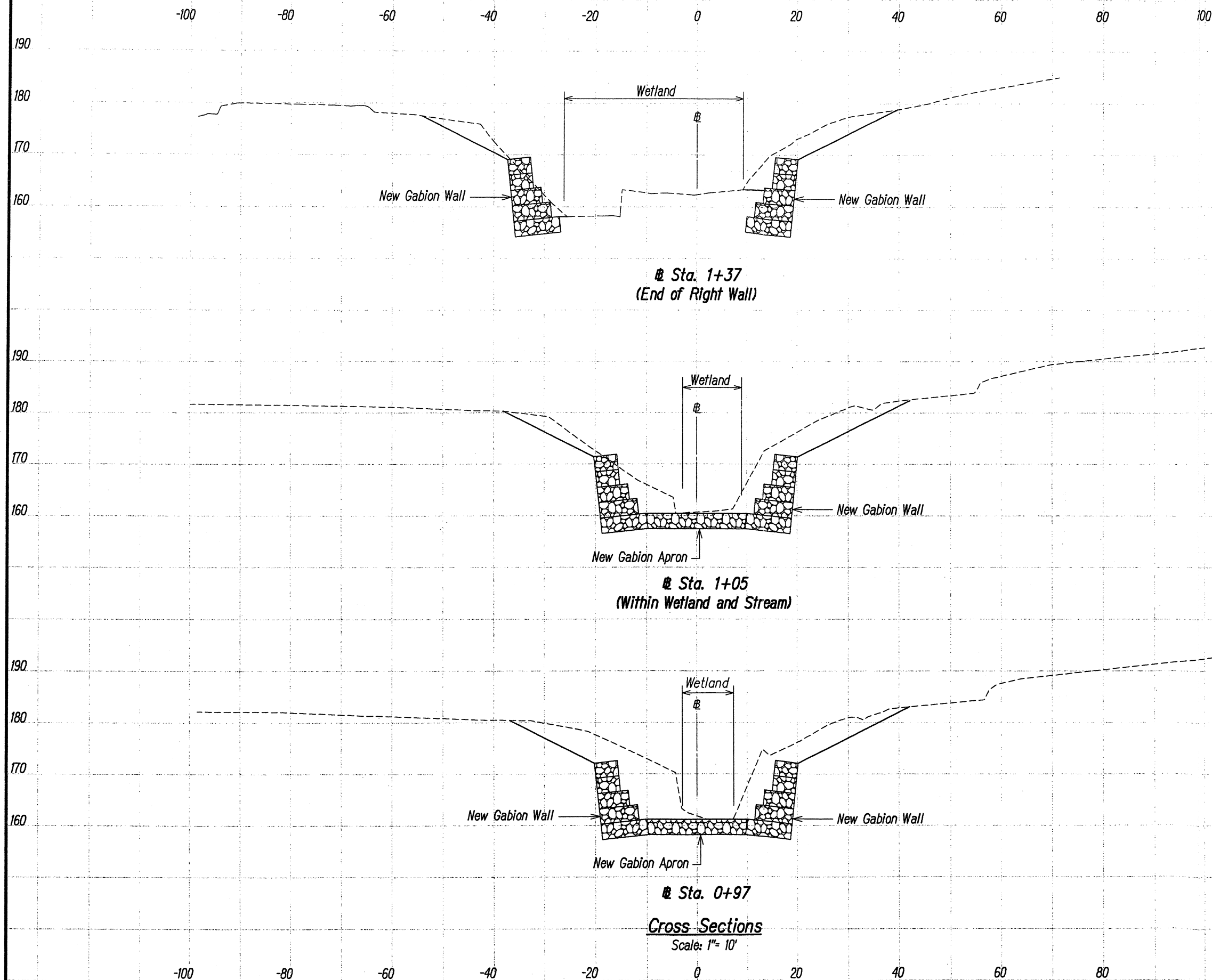
Perkins, Inc. APRIL 30, 2010
dba PARK ENGINEERING LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CROSS SECTIONS
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98
Scale: As Shown Date: March 2009
SHEET No. XSI OF XS3 SHEETS

ORIGIN	DATE
PLAN	
DESIGNED BY	
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QUANTITIES BY	
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Sta. 0+49.66
(At Connection)
Cross Sections
Scale: 1"= 10'

DATE	REVISION



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CROSS SECTIONS

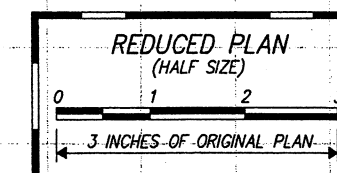
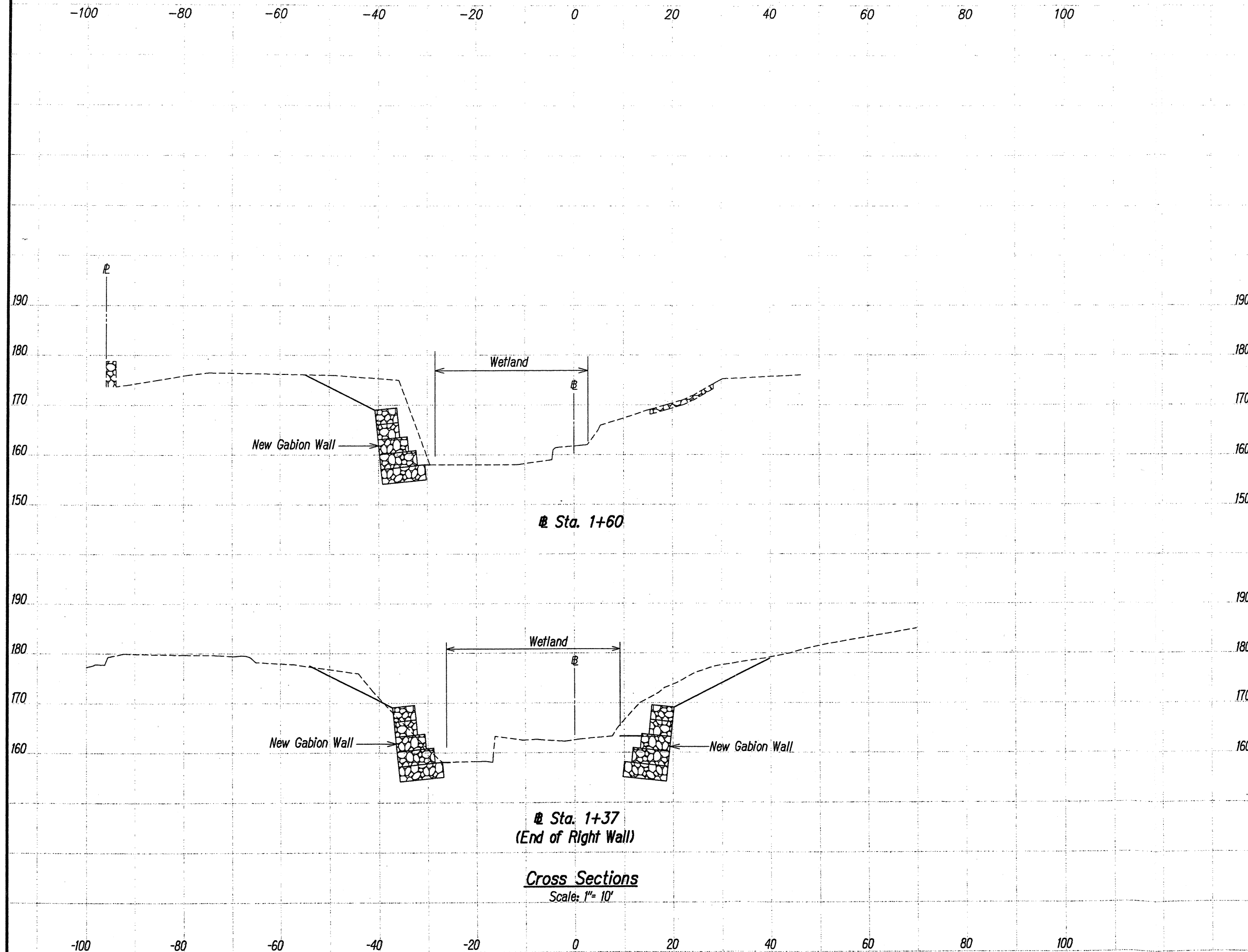
CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. XS2 OF XS3 SHEETS

ORIGI PLAN	SURVEY PLOTTED BY _____	DATE _____
	DRAWN BY _____	" _____
	TRACED BY _____	" _____
NOTE BOOK	DESIGNED BY _____	" _____
	QUANTITIES BY _____	" _____
No. _____	CHECKED BY _____	" _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-04-98	2009	33	33



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CROSS SECTIONS

CASTLE HILLS ACCESS ROAD
Drainage Improvements
Project No. HWY-0-04-98

Scale: As Shown Date: March 2009

SHEET No. XS3 OF XS3 SHEETS

33