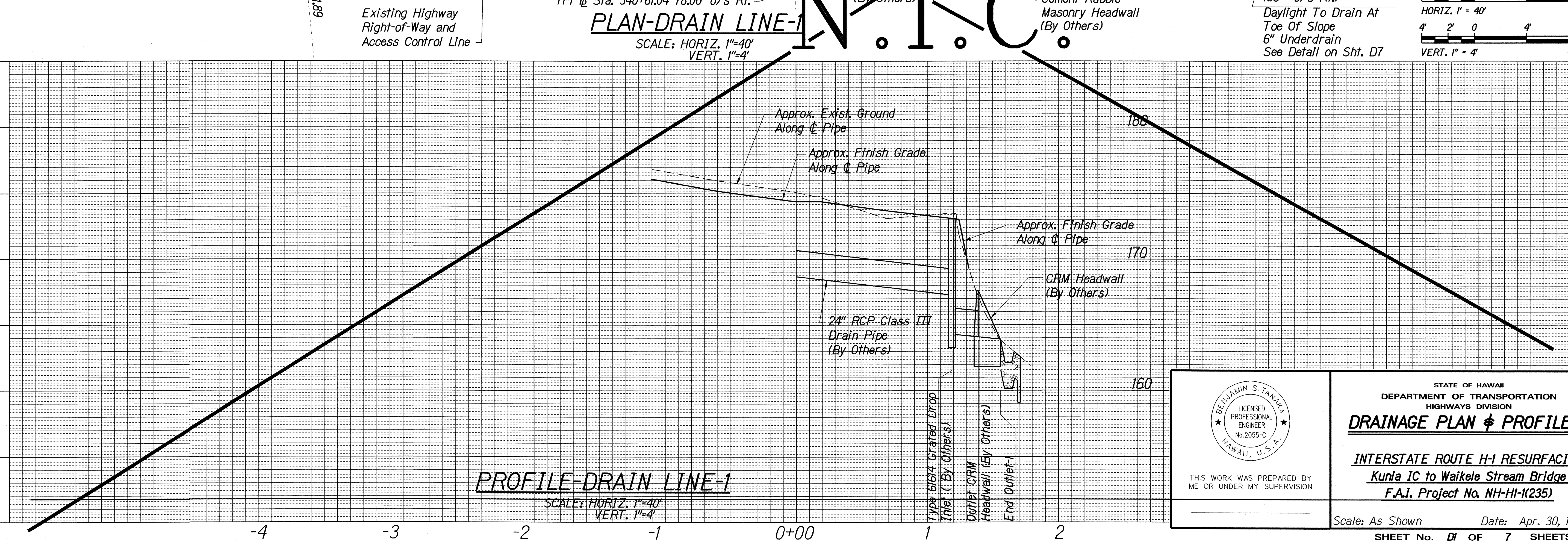
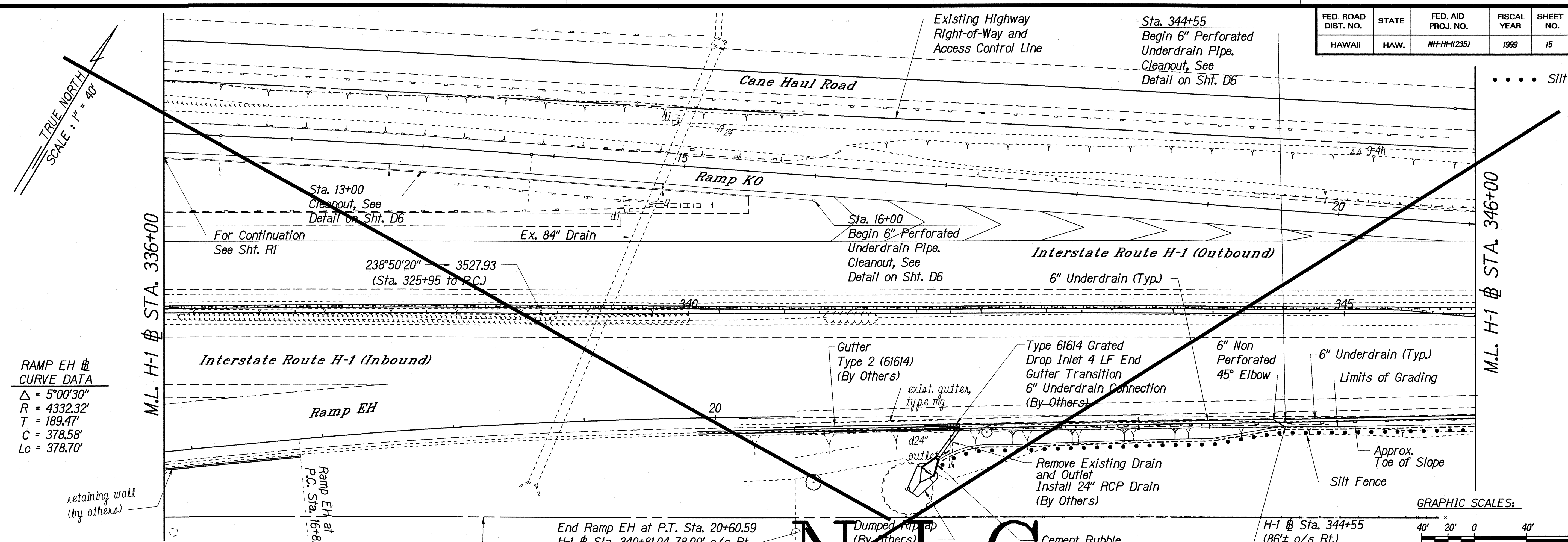


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-K(235)	1999	15	84



DESIGNED BY: _____ DATE: _____

TRACED BY: _____

NOTE BOOK: _____

CHECKED BY: _____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN & PROFILE

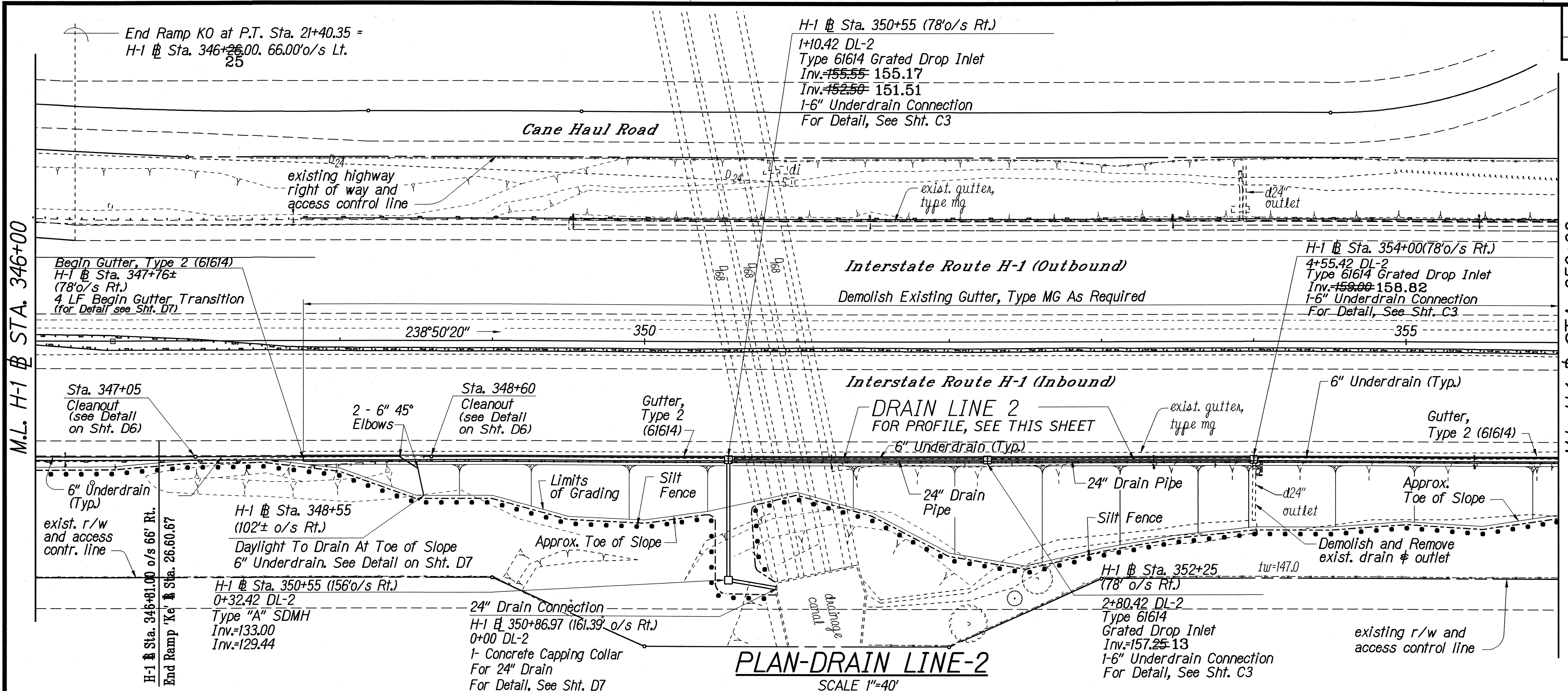
INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikale Stream Bridge
F.A.J. Project No. NH-HI-K(235)

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION

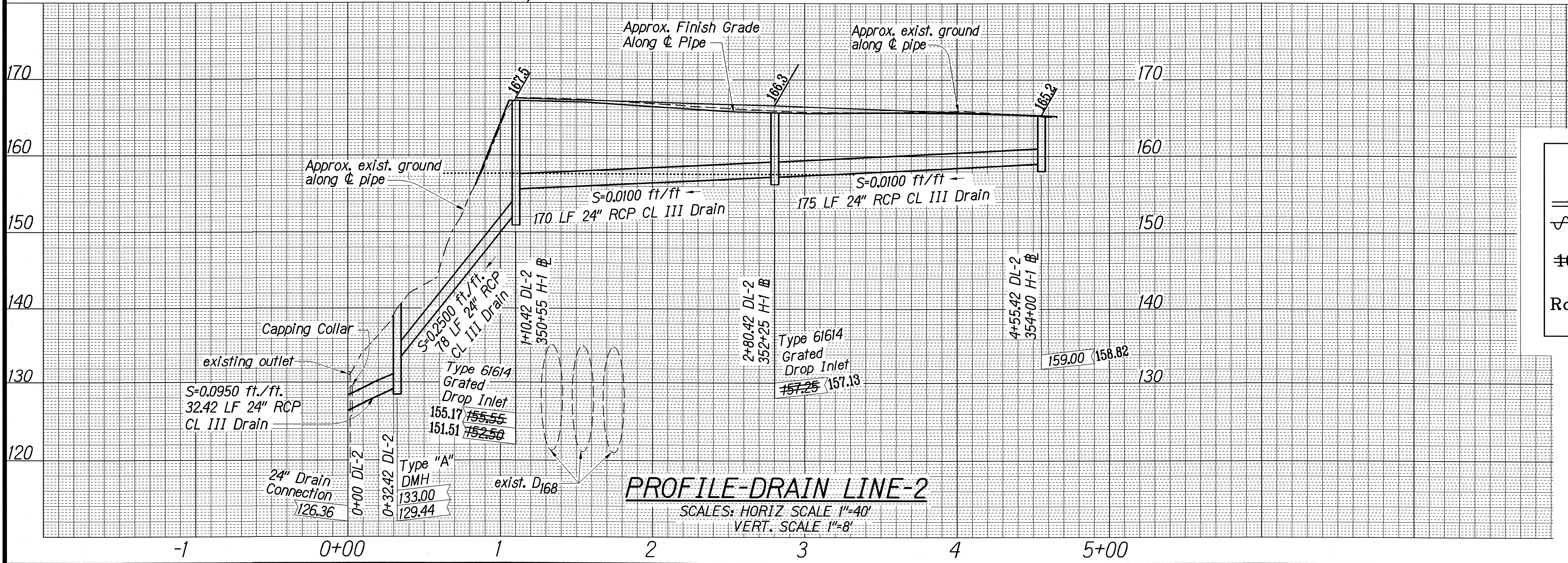
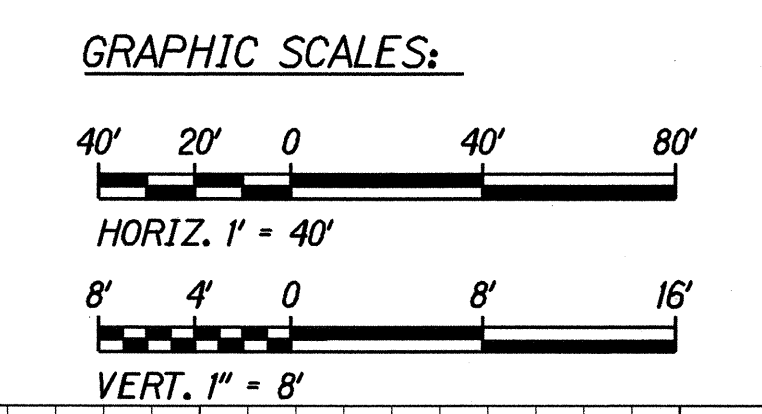
Scale: As Shown Date: Apr. 30, 1999

SHEET No. 15 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-1(235)	1999	16	84



TRUE NORTH
SCALE: 1" = 40'



LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN & PROFILE

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialea Stream Bridge
F.A.I. Project No. NH-HI-1(235)

Scale: As Shown Date: Apr. 30, 1999

SHEET No. 02 OF 7 SHEETS

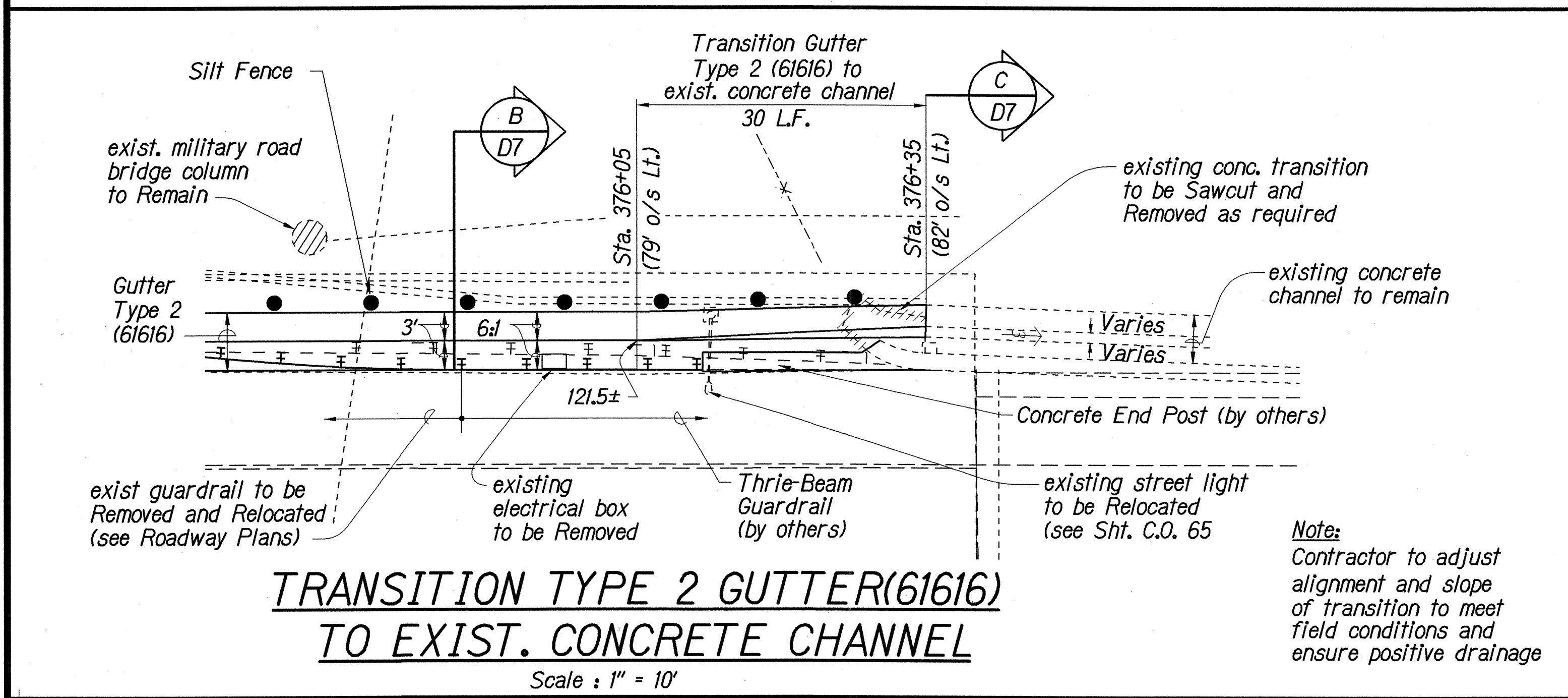
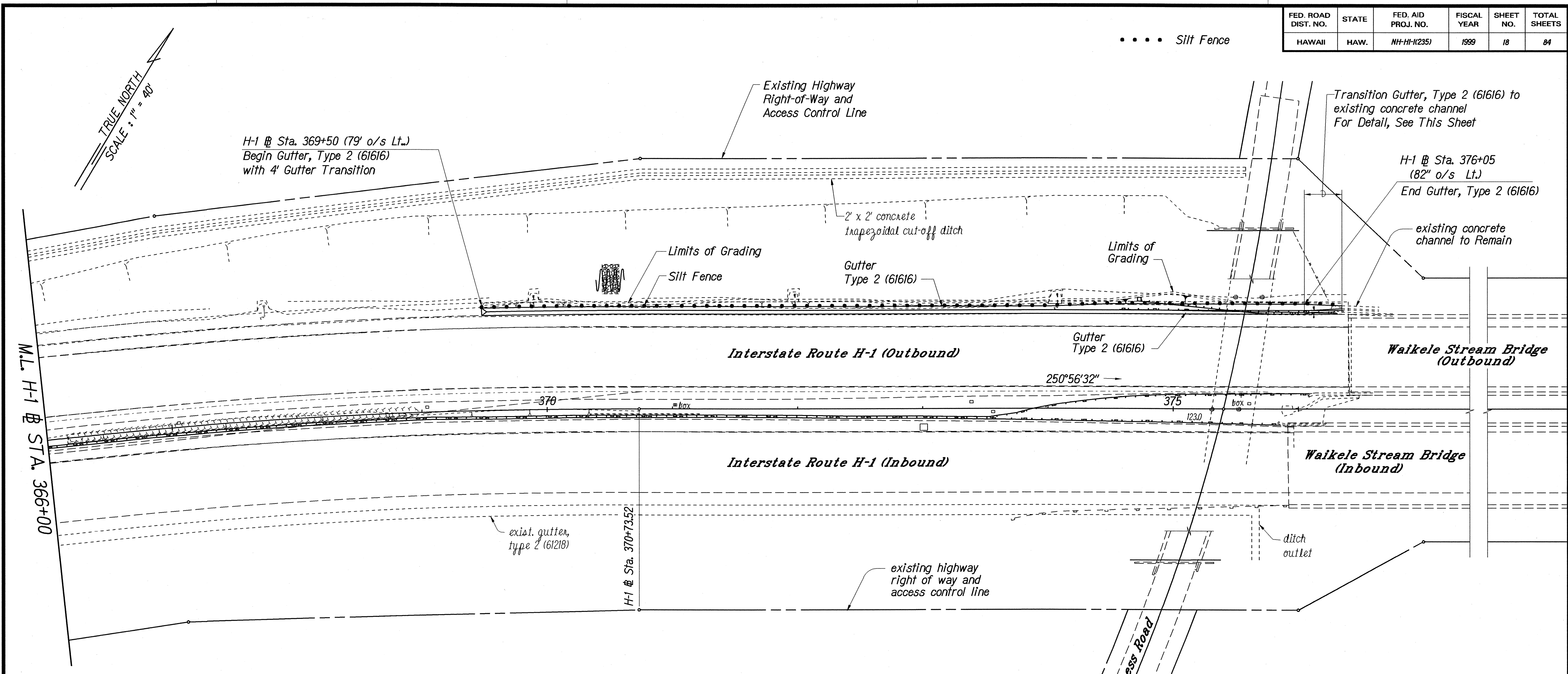
DATE: 01/26/99
SCALE: 1" = 40'
FILE: 9814-64

DESIGNED BY: SHA+FAI
CHECKED BY: 9814-64

DATE: 01/26/99
SCALE: 1" = 40'
FILE: 9814-64

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-K(235)	1999	18	84



LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikale Stream Bridge
F.A.I. Project No. NH-HI-K(235)

Scale: As Shown Date: Apr. 30, 1999

SHEET No. **D4** OF 7 SHEETS

"AS-BUILT"

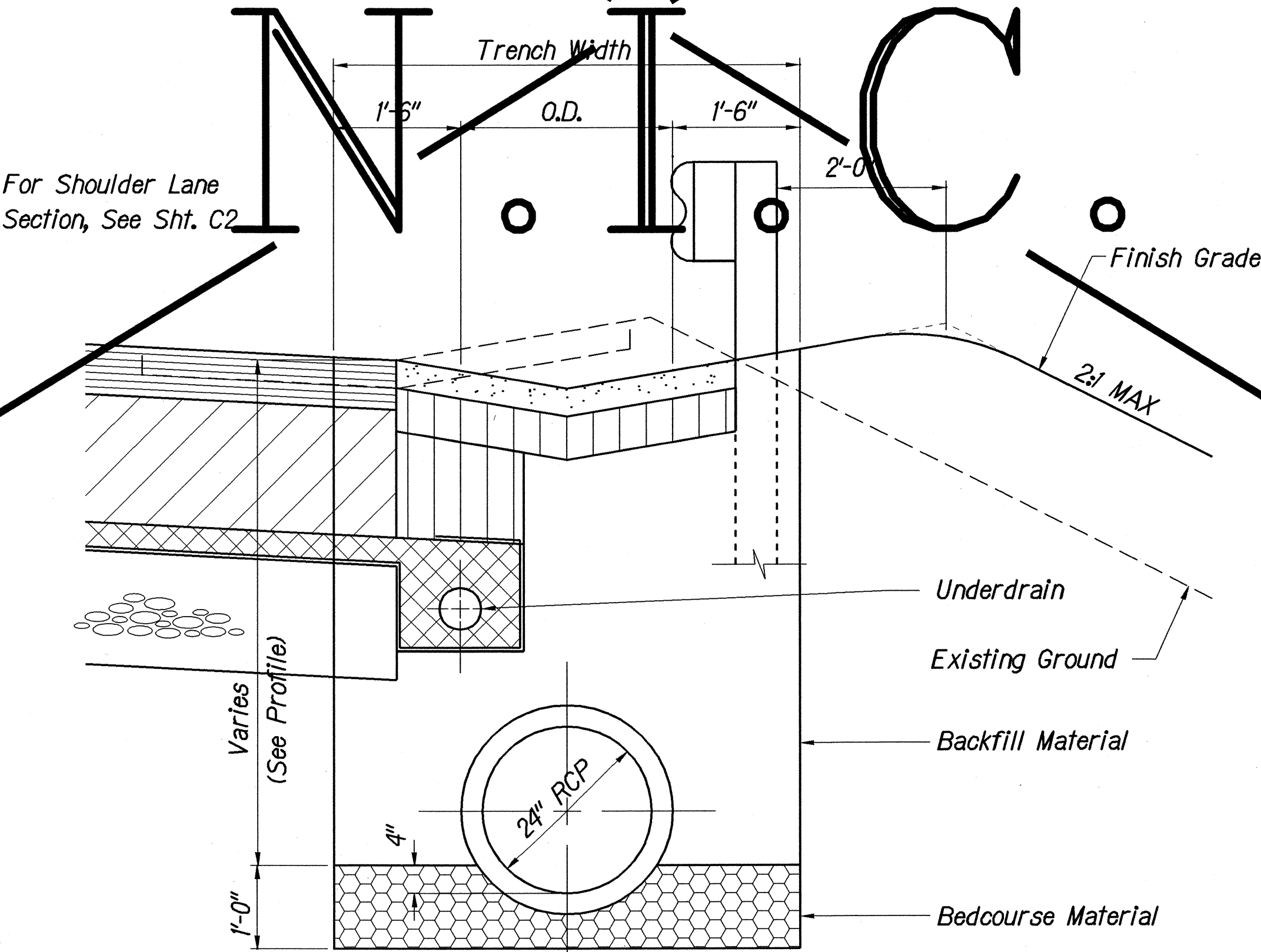
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-1(235)	1999	19	84

DRAINAGE SUMMARY

ITEM		202.	206.	508.	603.	603.	603.	604.	604.	604.	604.	604.	605.	605.	605.	609.	609.
UNIT USED		1000	2020	1000	0010	1010	3000	0011	0012	0014	0015	5117	3000	3100	3200	2614	2616
		LS.	C.Y.	EA.	C.Y.	LF.	EA.	EA.	EA.	EA.	EA.	EA.	LF.	LF.	EA.	LF.	LF.
BASELINE STATION LOCATION																	
FROM	TO	Removal of Existing Drainage Pipe and/or Structure	Structure Excavation for Drainage Systems	Outlet, Cement Rubble Masonry Headwall (For 24" Drain, 7'-0" Long (Min)), Including Residual Grading, Dumped Rip Rap and all Appurtenances.	Bed Course Materials For Culvert	24" Reinforced Concrete Pipe, Class III	Concrete Capping Collar for 24" Drain Connection	Type 61614 Grated Drop Inlet, 6.00 ft. to 6.99 ft.	Type 61614 Grated Drop Inlet, 8.00 ft. to 8.99 ft.	Type 61614 Grated Drop Inlet, 11.00 ft. to 11.99 ft.	Type 61614 Grated Drop Inlet, 14.00 ft. to 14.99 ft.	Type A Storm Drain Manhole, 11.00 ft. to 11.99 ft.	6-Inch Perforated Underdrain Pipe	6-Inch Non Perforated Underdrain Pipe	Cleanout	Gutter, Type 2 (61614) Including Base Course and all Appurt.	Gutter, Type 2 (61616) Including Base Course and all Appurt.
H-1 I.B. @ Sta. 342+02 (86' o/s RT.)	H-1 I.B. @ Sta. 354+00 (78' o/s RT.)	1	875		57	455		1	1		1	1	1,185	16	3	624	
H-1 I.B. @ Sta. 354+02.5 (78' o/s RT.)	H-1 I.B. @ Sta. 359+30 (108' o/s RT.)		337	1	58	273		2		1			530	6		530	
H-1 I.B. @ Sta. 369+50 (82' o/s LT.)	H-1 I.B. @ Sta. 376+35 (82' o/s LT.)	1															685
Ramp KO @ Sta. 1+10±	Ramp KO @ Sta. 16+00												670	830	4		
TOTAL		2	1,212	1	115	728	1	3	1	1	1	1	2,385	852	7	1,154	685

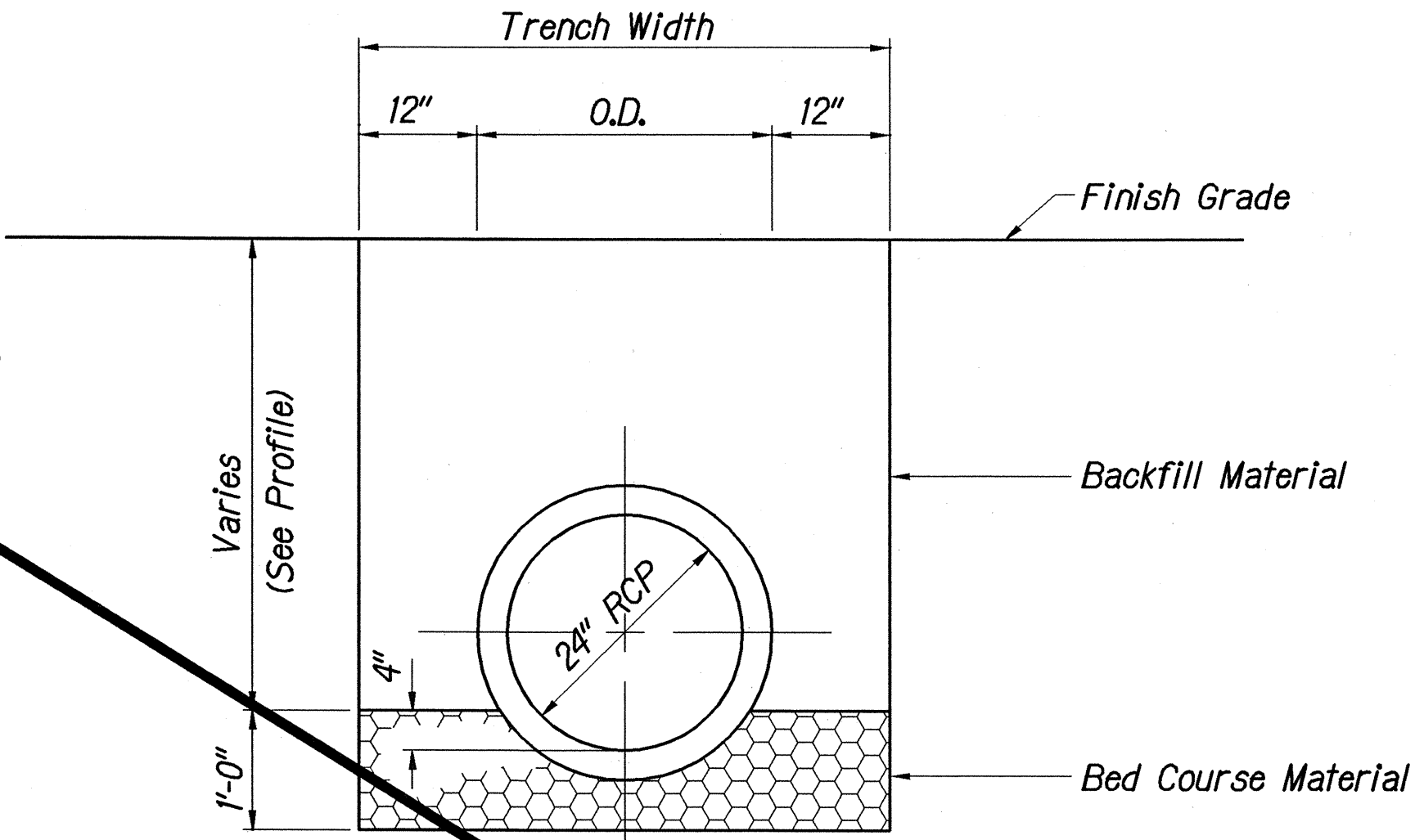
DRAINAGE NOTES

- Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow. The cost shall be incidental to the various Contract Items.
- The Contractor shall verify the locations of all existing culverts and utilities damaged during construction shall be repaired or replaced by the Contractor at his own expense.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on Plans, the approximate diameter of drilled holes for installation of dowels shall be 3/4", and voids after installing dowels shall be filled with epoxy grout as directed by the Engineer.
- Demolishing, removing, and disposing portions of existing concrete drainage inlets and metal railings shall not be paid for separately but shall be considered incidental to the various Contract Items.
- For added reinforcing around culverts at new drainage structures, see Standard Plan H-04.
- Concrete shall be Class A unless otherwise noted.
- Chamfer all exposed concrete edges 1".



TYPICAL DETAIL OF 24" CULVERT
TRENCH RESTORATION UNDER CONCRETE GUTTER

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



TYPICAL DETAIL OF CULVERT
TRENCH RESTORATION

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

BENJAMIN S. TANAKA
LICENSED PROFESSIONAL ENGINEER
No. 2055-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS & SUMMARY

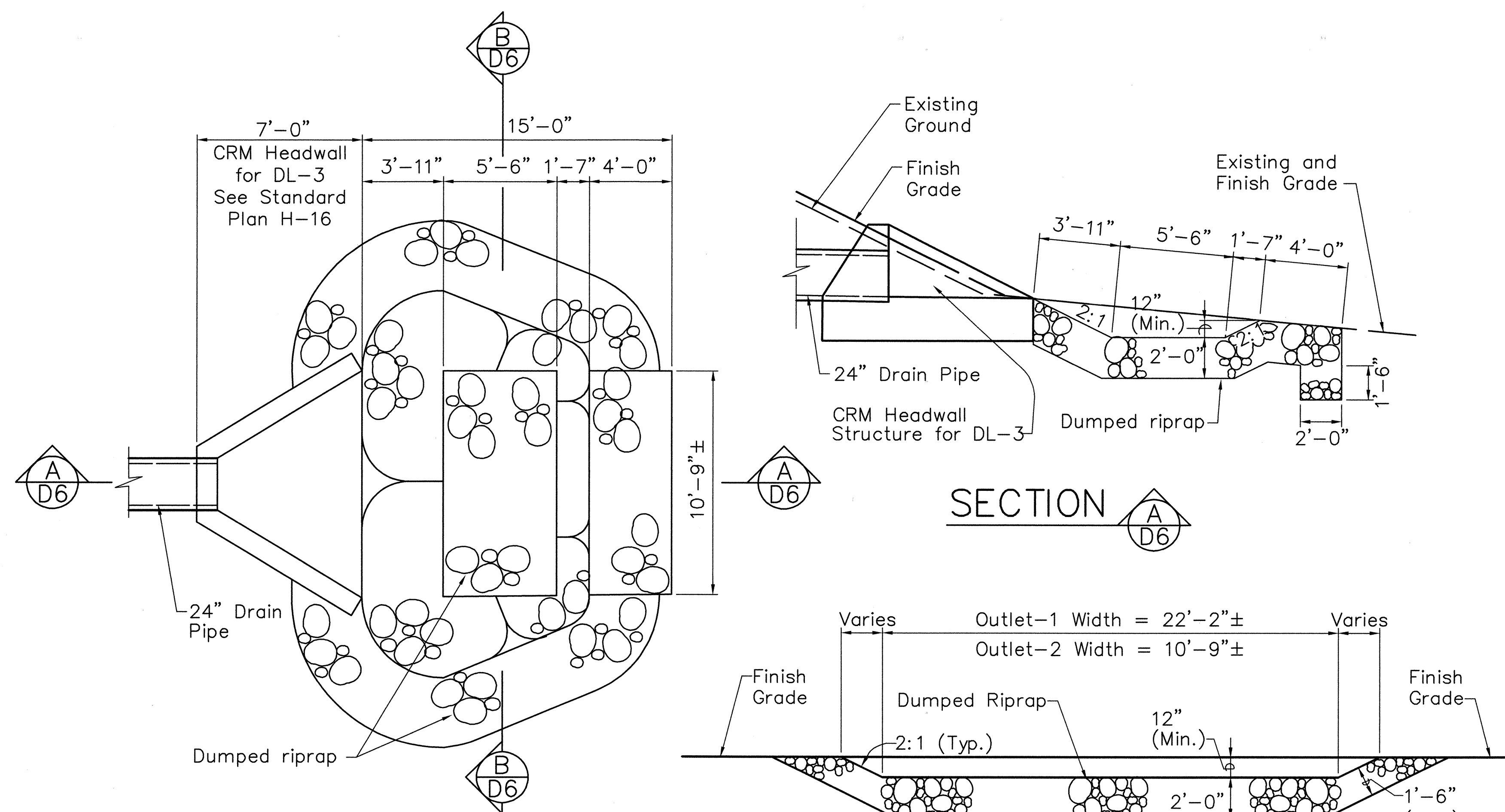
INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
F.A.I. Project No. NH-HI-1(235)

Scale: As Shown Date: Apr. 30, 1999

SHEET No. D5 OF 7 SHEETS

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	20	84

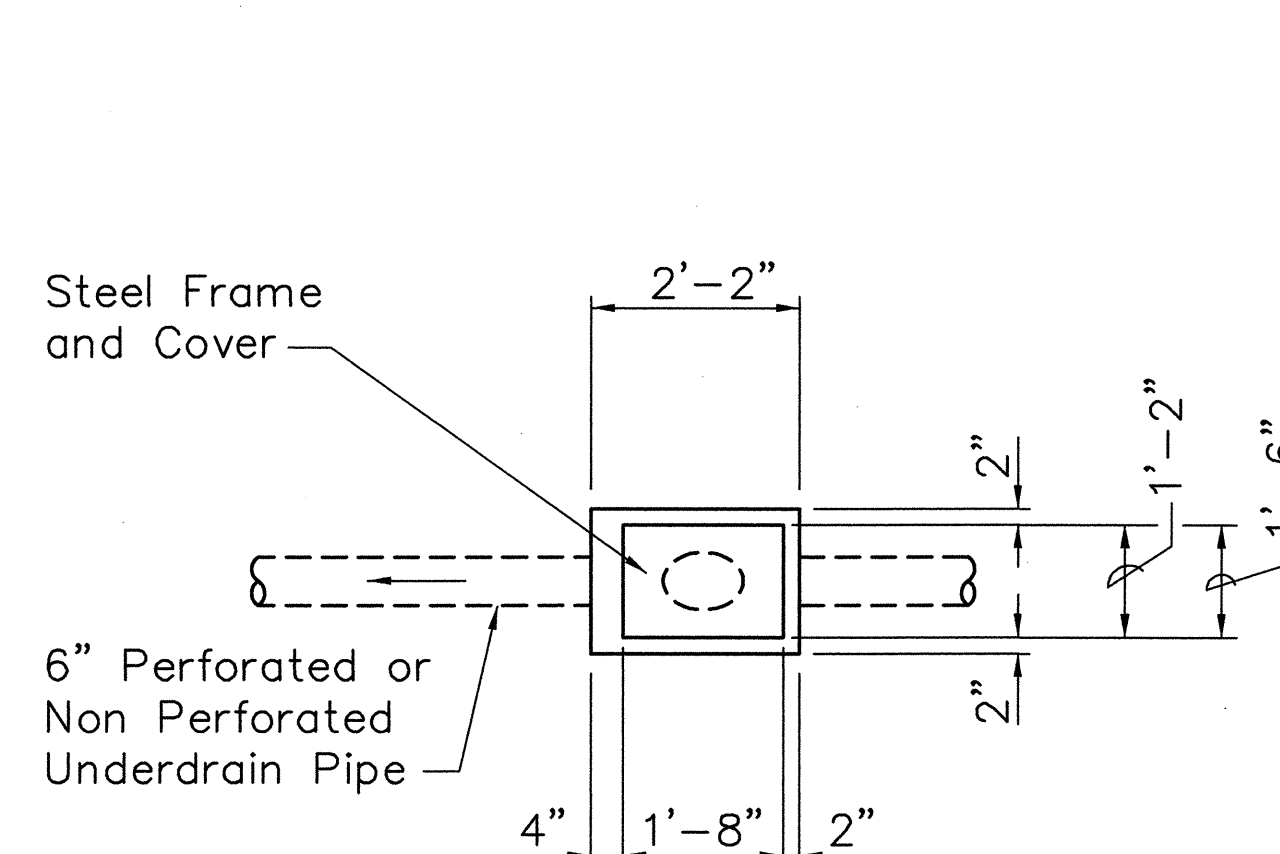


PLAN - OUTLET

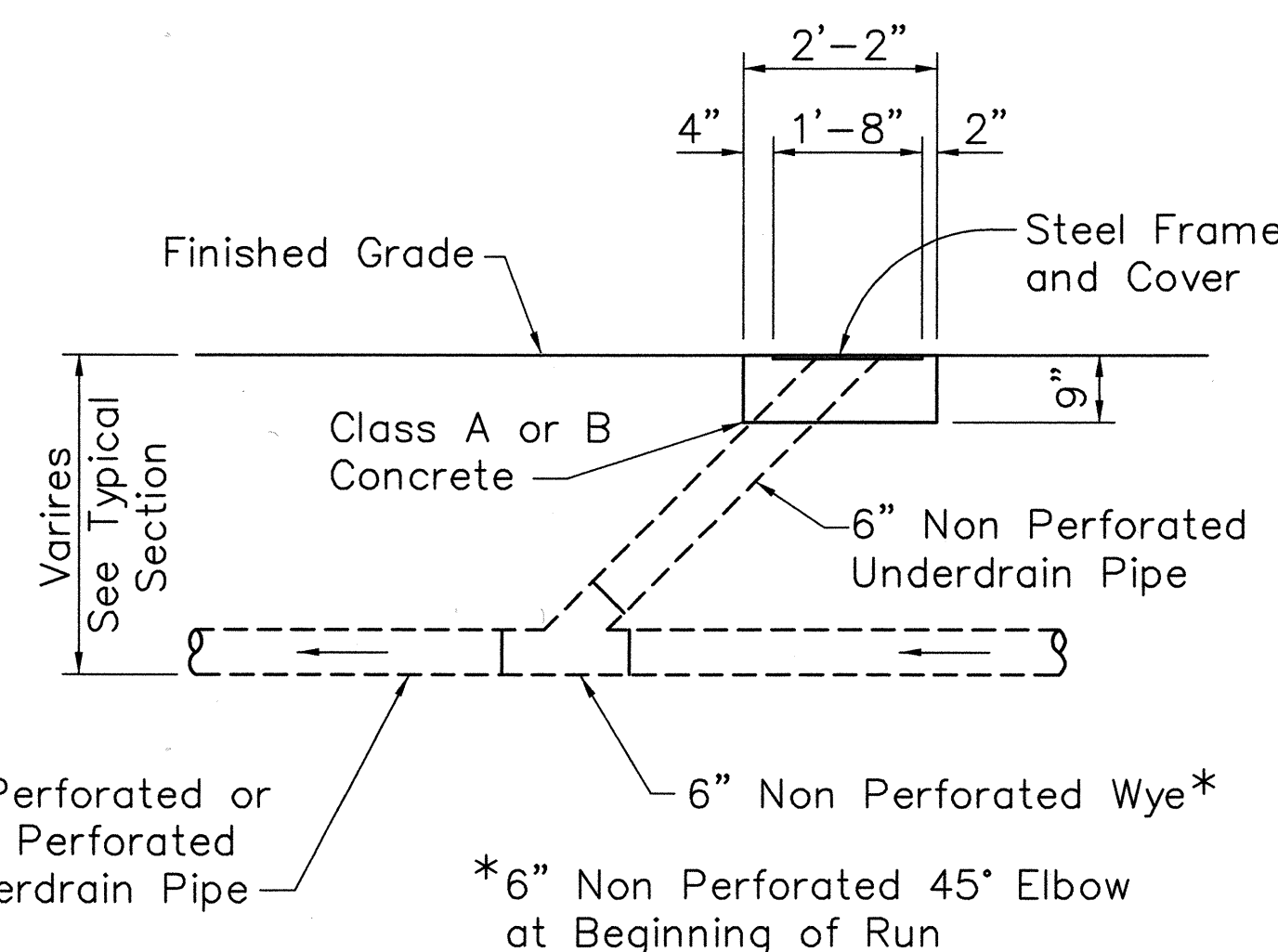
SECTION A D6

TYPICAL DETAILS OF DUMPED RIPRAP AT OUTLET STRUCTURES

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



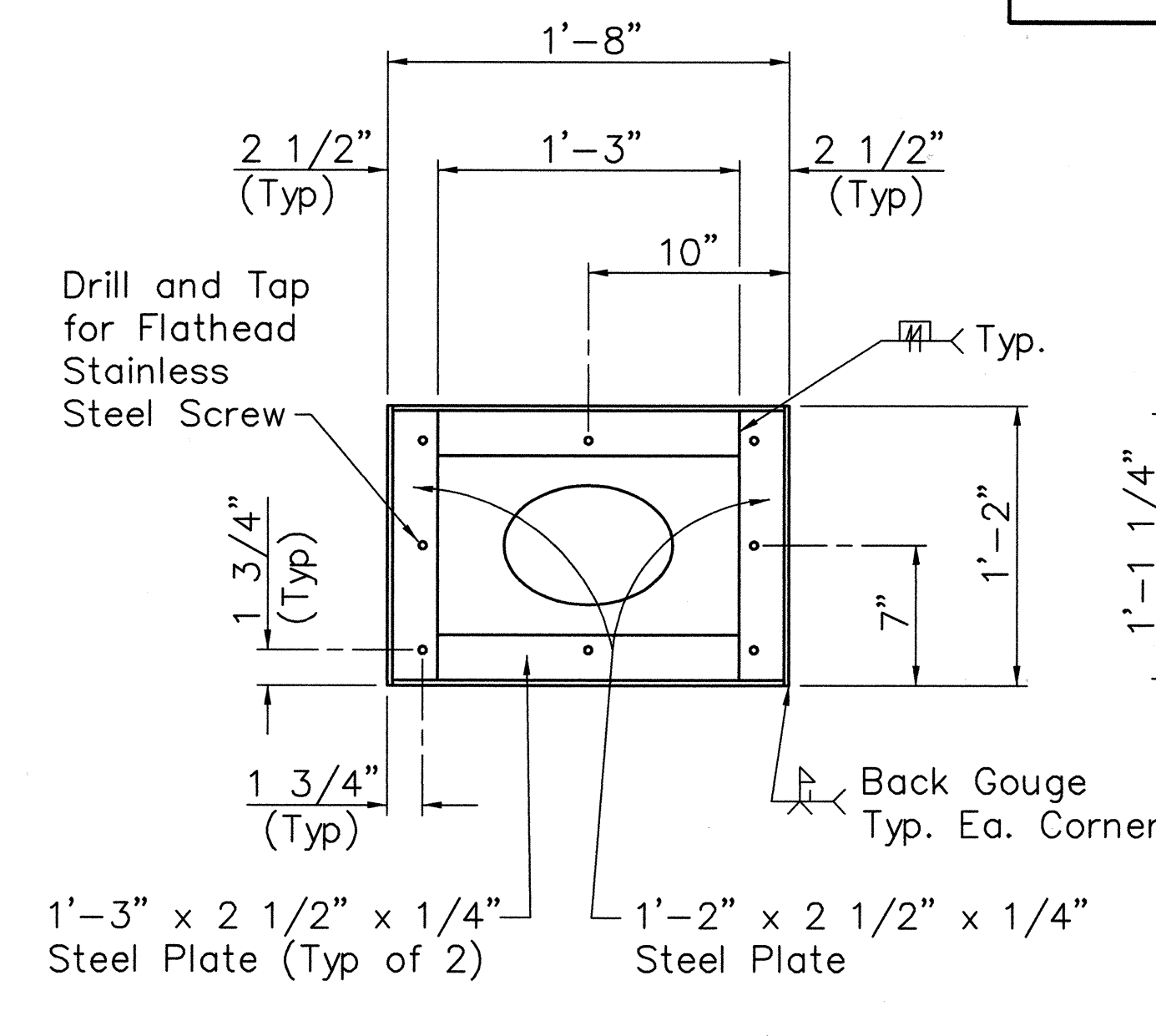
PLAN



SECTION

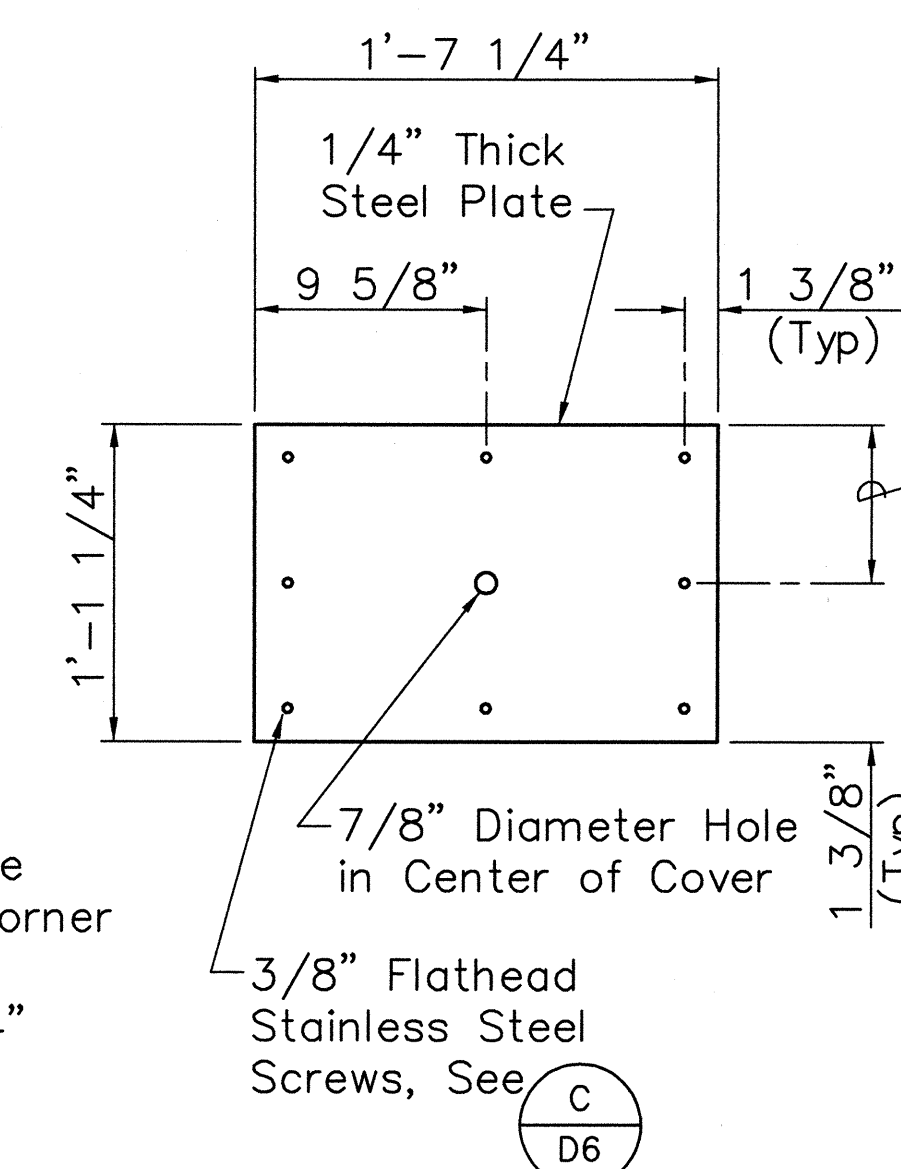
TYPICAL DETAILS OF CLEANOUT

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



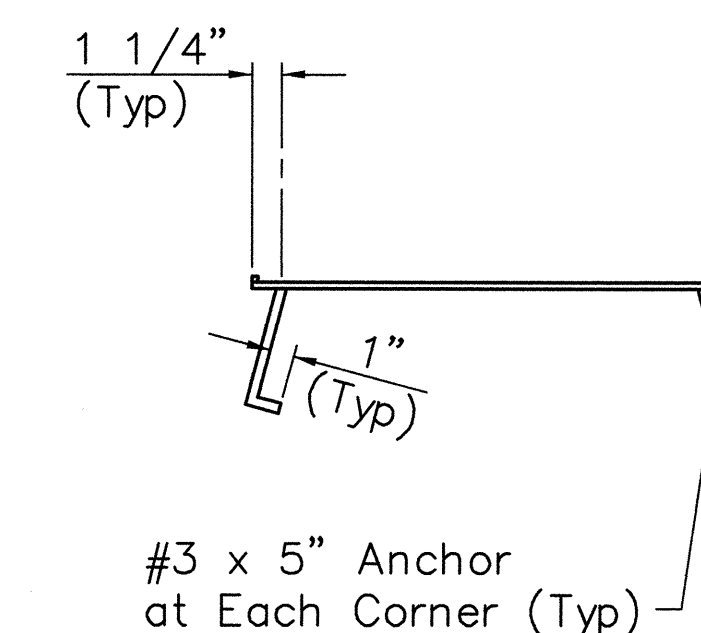
FRAME - PLAN

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



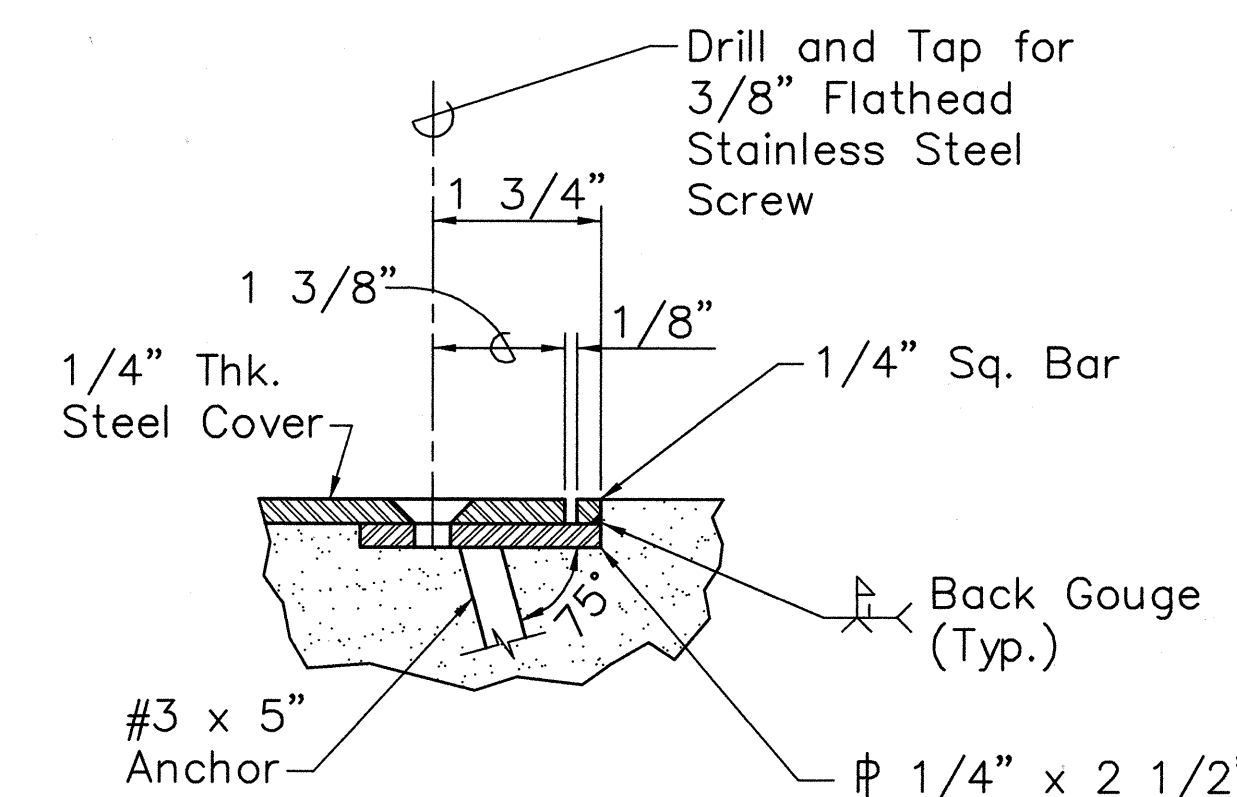
COVER - PLAN

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



FRAME - SECTION

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



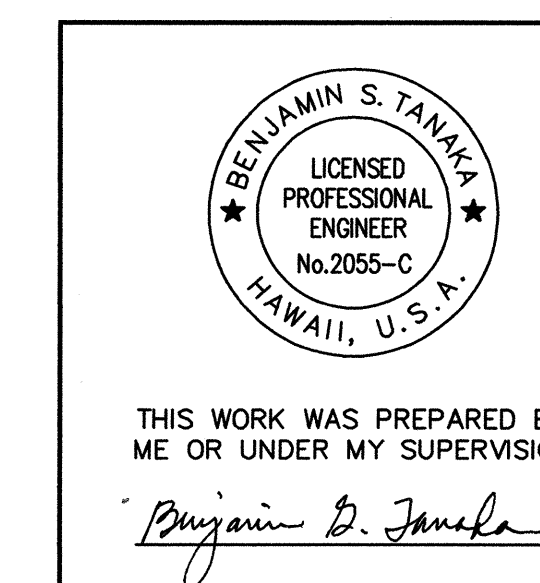
DETAIL C D6

Not to Scale

Note: All Steel Parts Shall be Galvanized in Accordance With the Requirements of ASTM A123.

DETAILS OF STEEL FRAME AND COVER FOR CLEANOUT

Scale: As Shown



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
F.A.I. Project No. NH-H1-1(235)

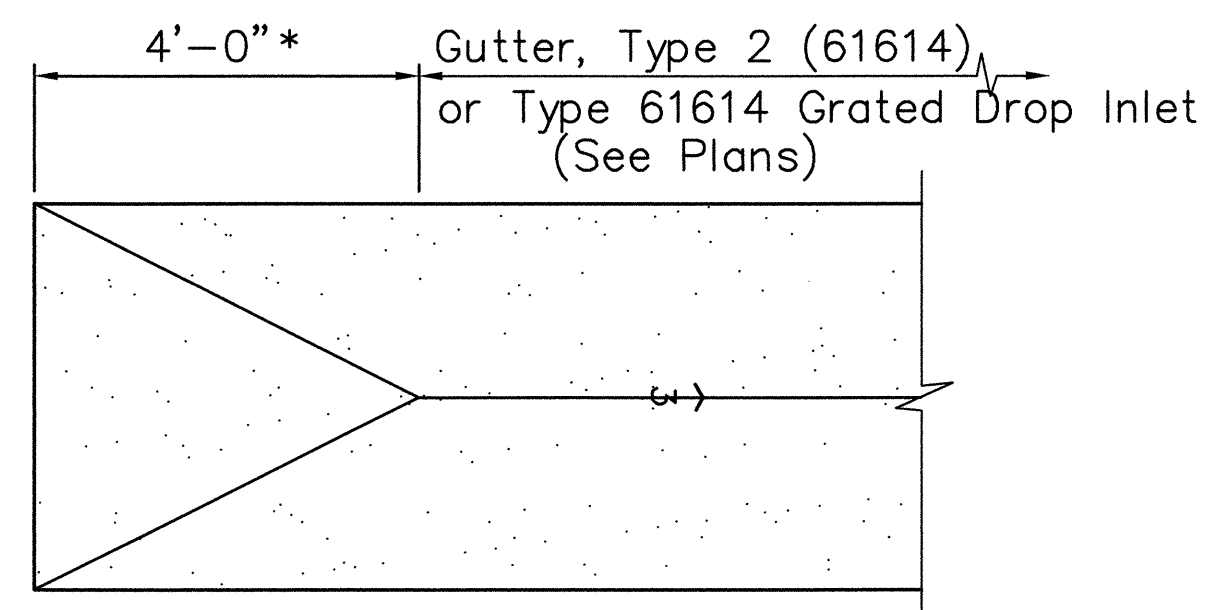
Scale: As Shown Date: Apr. 30, 1999

SHEET NO. D6 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	21	84

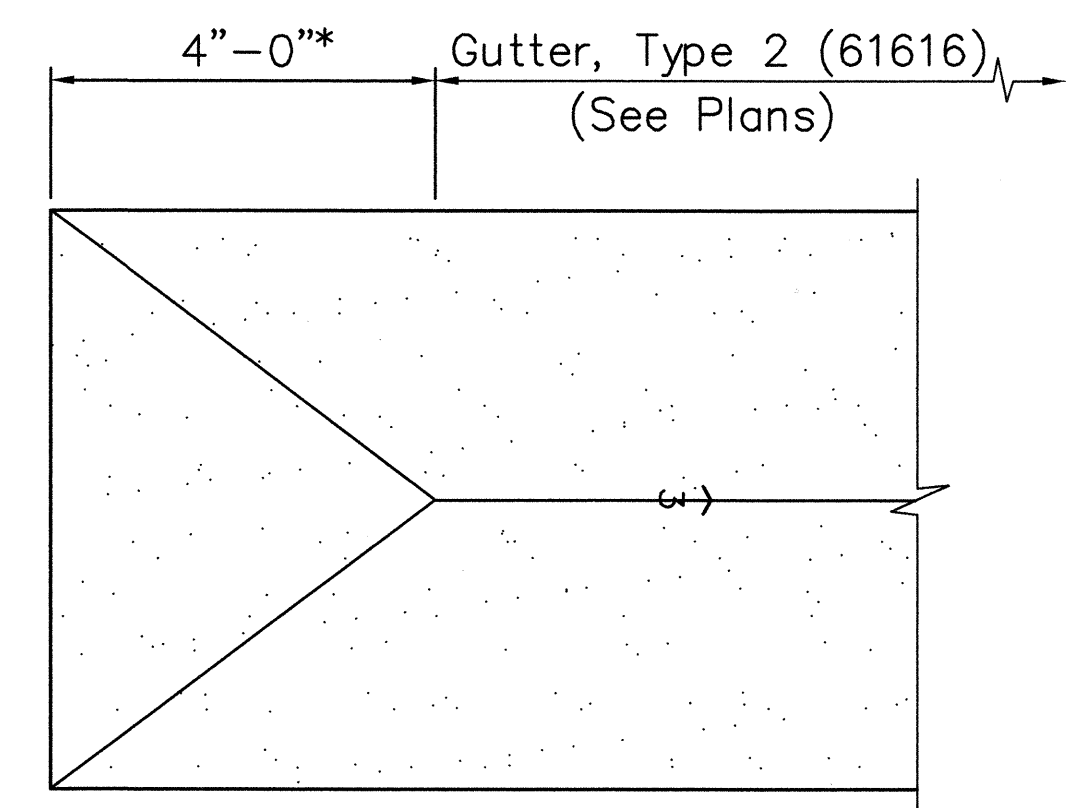
Note:

* Gutter Transition shall be paid for under Gutter, Type 2 (61614), (61616) or (61218).



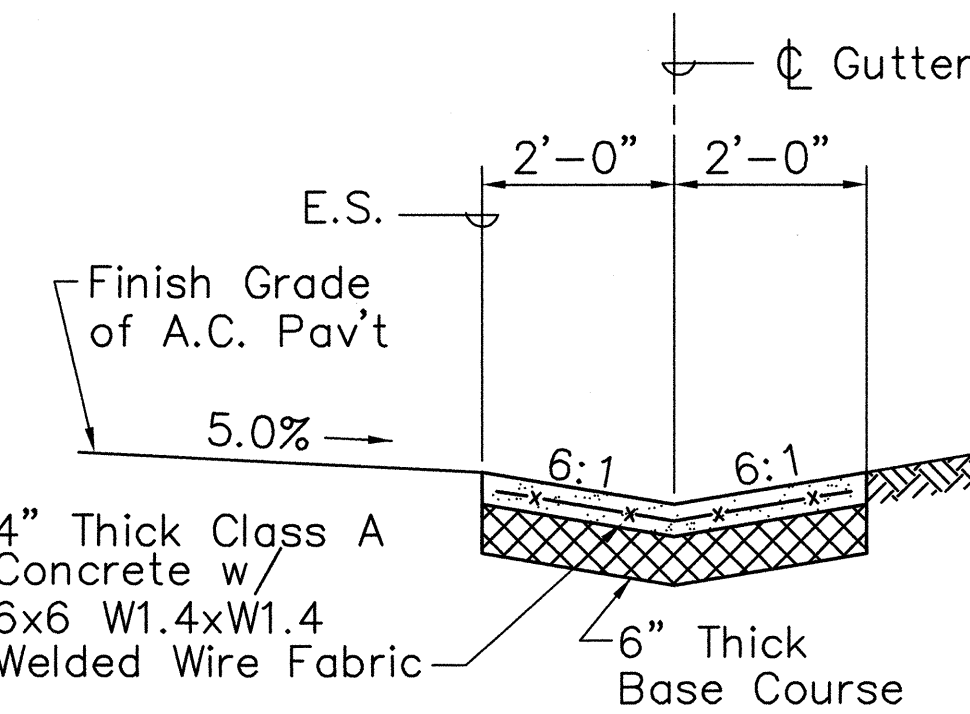
GUTTER, TYPE 2 (61614) TRANSITION DETAIL

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



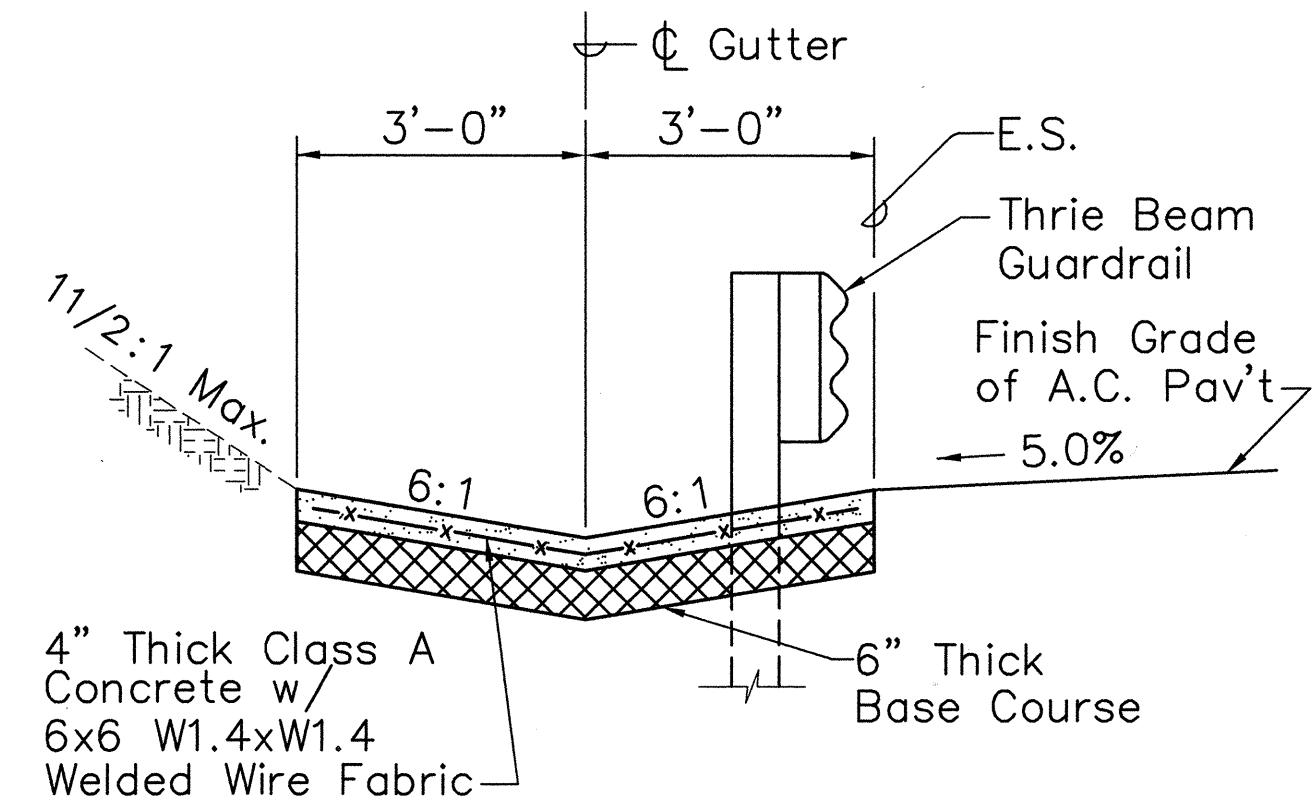
GUTTER, TYPE 2 (61616) TRANSITION DETAIL

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



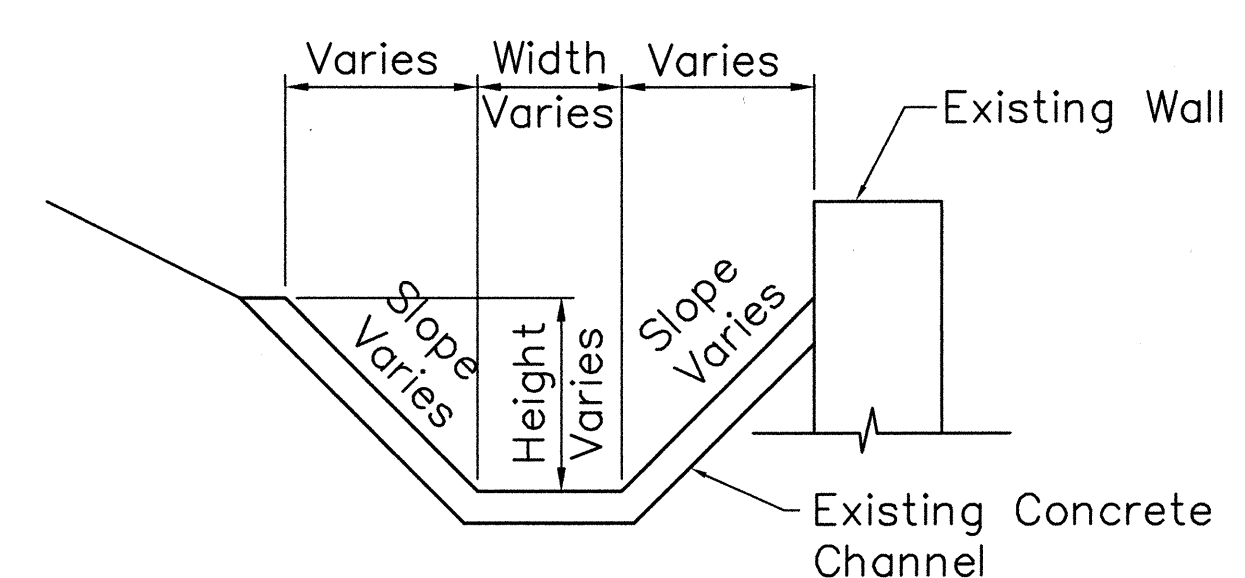
GUTTER, TYPE 2 (61614) DETAIL

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



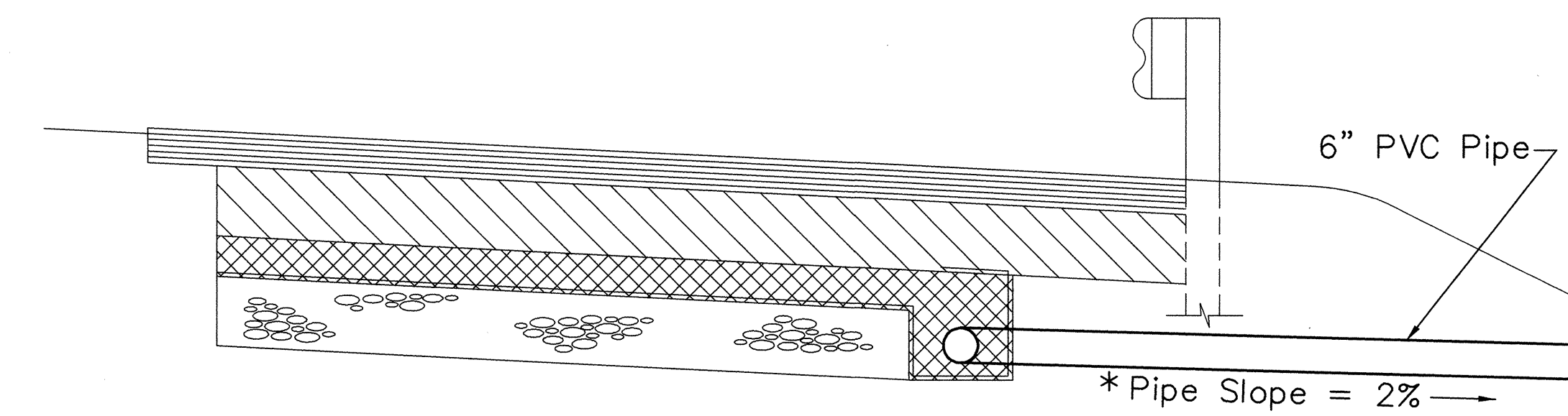
GUTTER, TYPE 2 (61616) DETAIL

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



EXISTING CONCRETE CHANNEL DETAIL

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



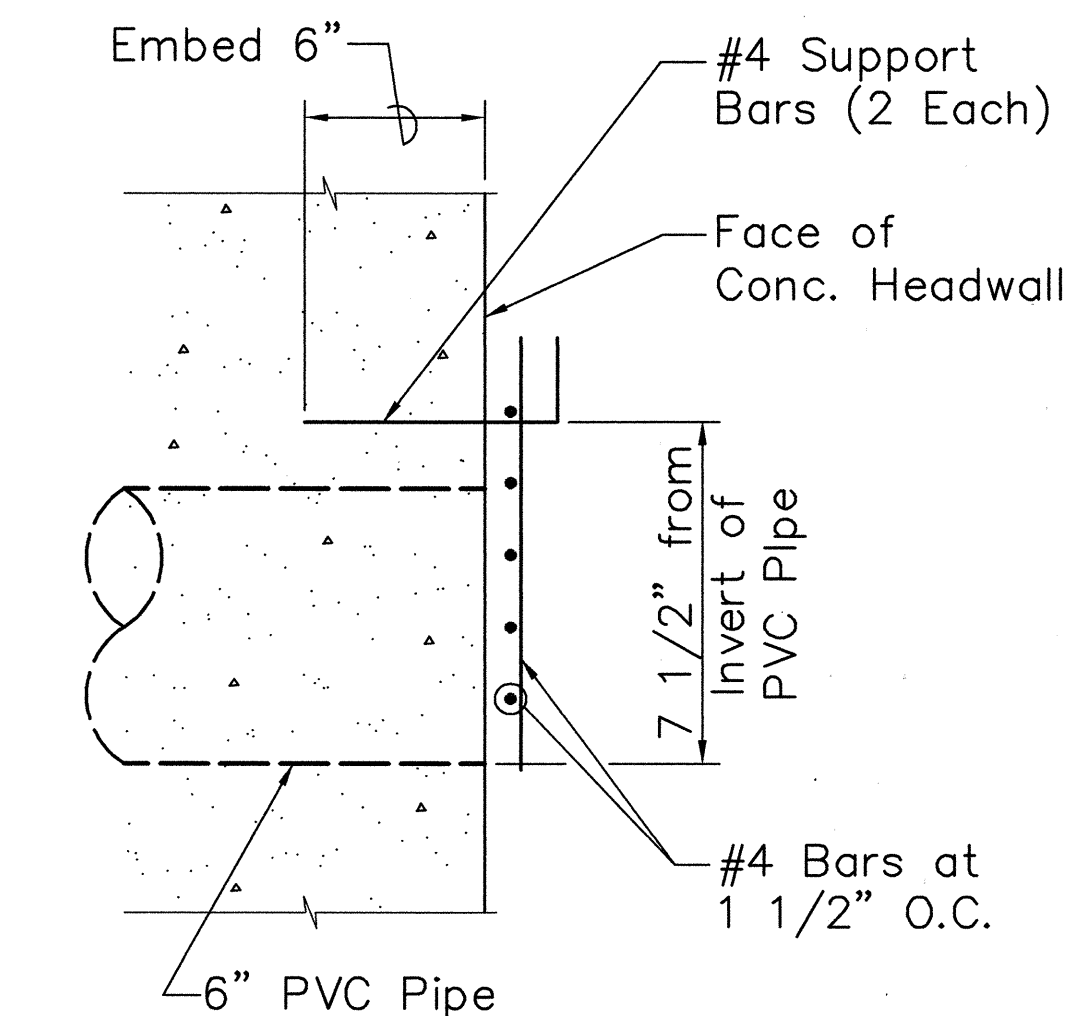
* Adjust Pipe Slope to Suit Field Conditions.

PIPE OUTLET DAYLIGHT DETAIL

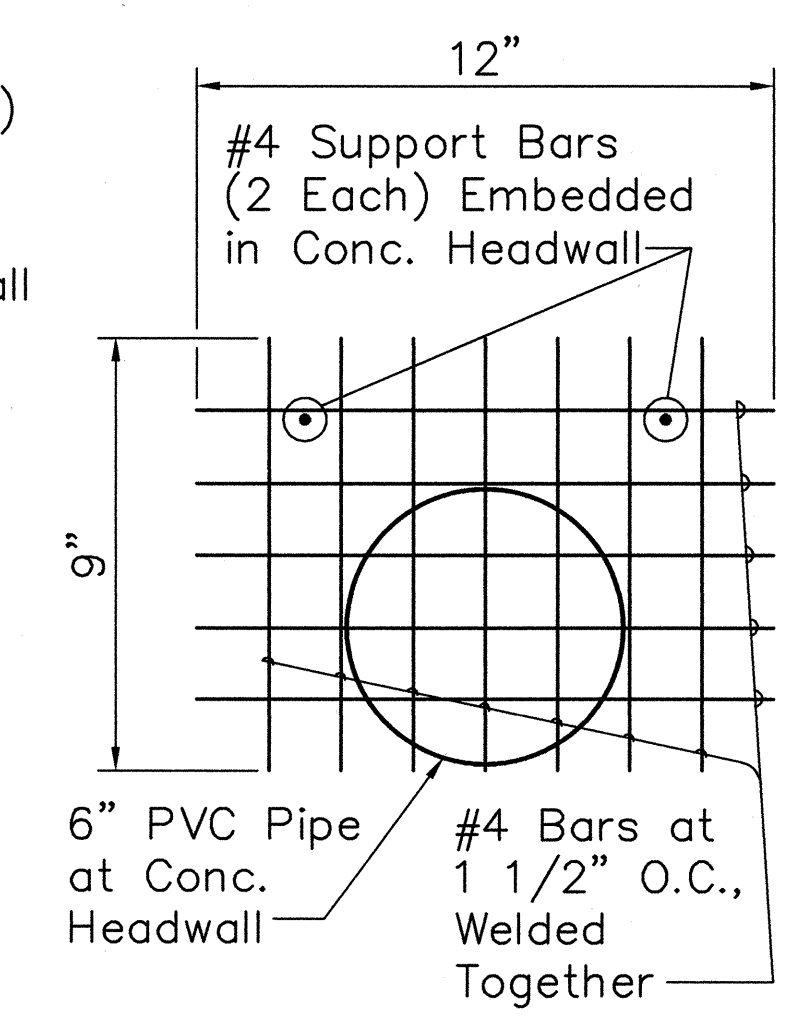
Not to Scale

Concrete Headwall. Use Standard Plan H-16 Except for the Following Dimensions:
D = 6"
B = 12"
L = 1'-6"
H = 3'-6"
Incidental to 6-Inch Perforated and Non-Perforated Drain Pipe

Rebar Screen See Detail Below Incidental to Perforated and Non-Perforated Drain Pipe



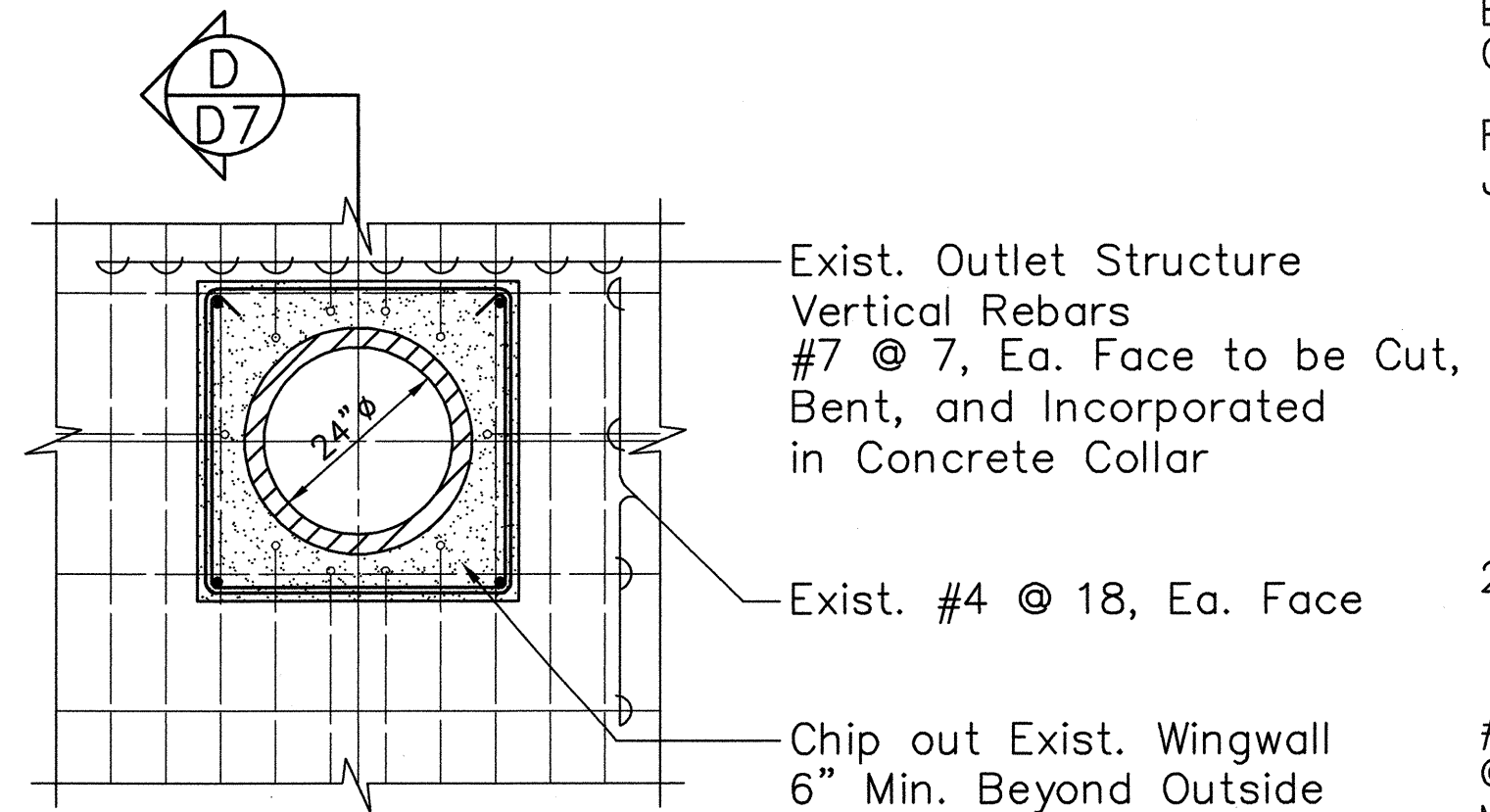
PARTIAL SECTION



ELEVATION

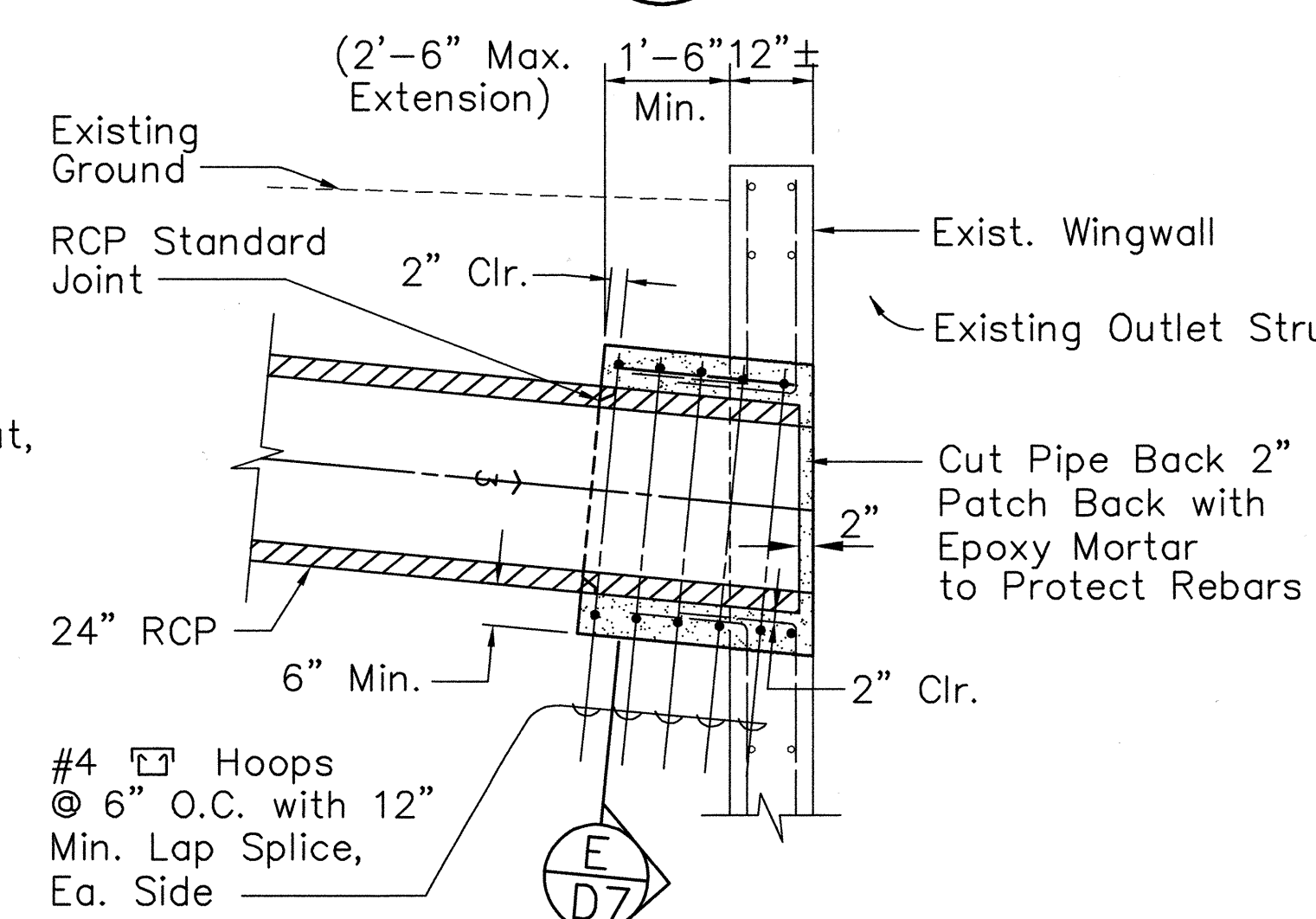
REBAR SCREEN DETAILS

Not to Scale



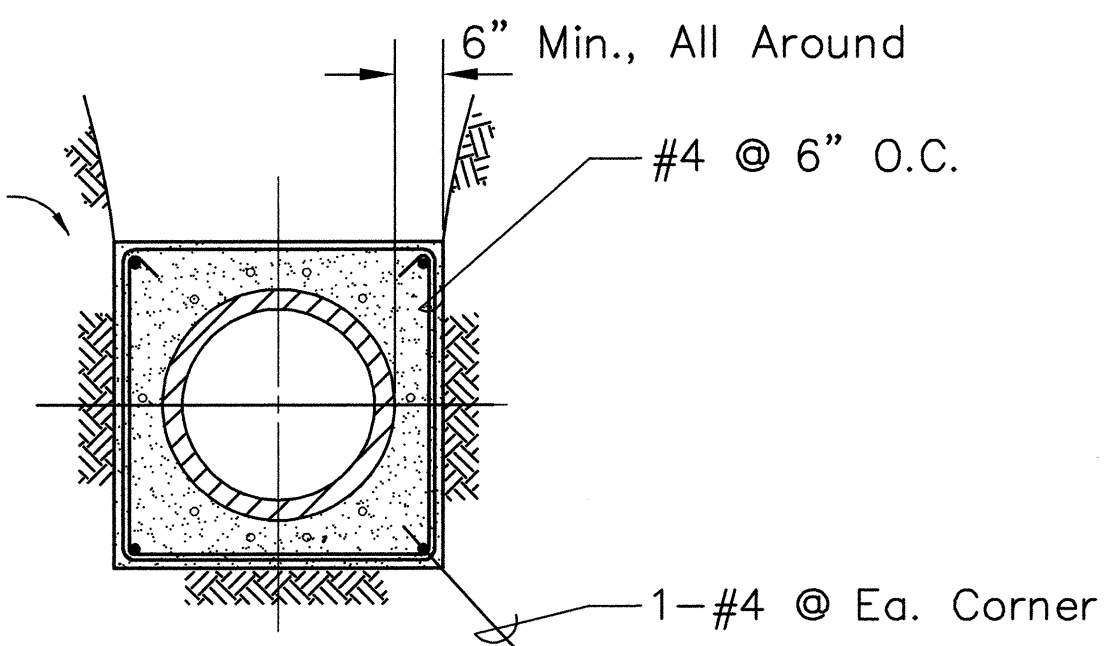
ELEVATION

Not to Scale



SECTION D

Not to Scale



SECTION E

Not to Scale

24"Ø RCP CONCRETE CAPPING COLLAR CONNECTION DETAILS

Scale: As Shown

BENJAMIN S. TANAKA
LICENSED PROFESSIONAL ENGINEER
No. 2055-C
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Benjamin S. Tanaka

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
F.A.I. Project No. NH-H1-1(235)
Scale: As Shown Date: Apr. 30, 1999
SHEET NO. D7 OF 7 SHEETS