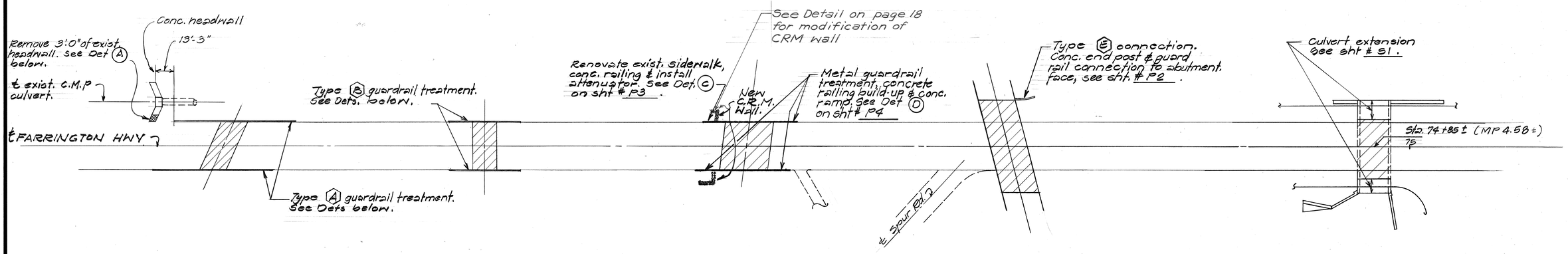
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	16	37



HWY. OVERPASS
@ STA. 10+00 ±

17' x 5' BOX CULVERT
@ STA. 23+90 ±

KAUKONAHUA BRIDGE
@ STA. 34+66.12 To STA. 33+51.18

HWY. UNDERPASS
@ STA. 45+08 ±

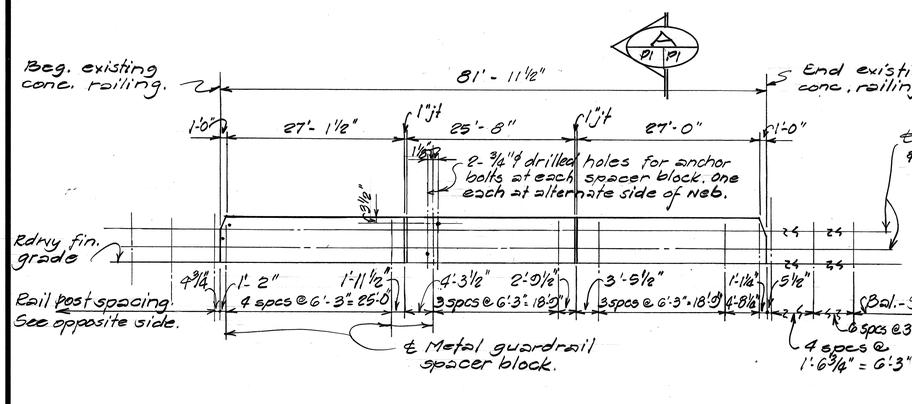
CULVERT EXTENSION
@ STA. 74+85 ±

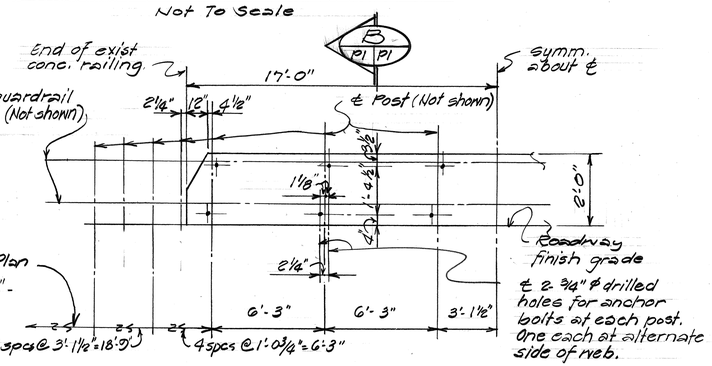
JOB SITE LOCATION PLAN

Not To Scale

GENERAL NOTES

1 See Standard Specifications for Road and Bridge Construction, (Hawaii 1985) and Special Provisions.
2 See State of Hawaii, DOT. Standard Plans sht TE-50, TE-51 & TE-57 for details of metal guardrail & "terminal connector."
3 All anchor bolts shall be high strength bolts conforming to the requirements of ASTM A325.
4 "Terminal Connector" shall be fabricated from 10 gage steel conforming to the requirements of AASHTO M180.
5 All "terminal connector", anchor bolts, cap ℔, nuts, and washers, shall be hot-dip galvanized.
6 First 25'-0" of guardrail adjoining "Terminal Connector" shall be of galvanized steel and supports spaced at 1'-6 3/4" for the first 9'-4 1/2" and at 3'-1 1/2" for the balance.
7 Large impacting or vibratory type of equipment will not be permitted in the removal operation of the designated items nor for drilling of holes.
8 Any damage to the existing structures due to the Contractor's operation shall be repaired at his expense, to the satisfaction of the Engineer.
9 The Contractor shall verify all dimensions in field before commencing with work.
10 The Contractor shall verify the location of all existing utility lines near structures and notify their respective owners before commencing with work.



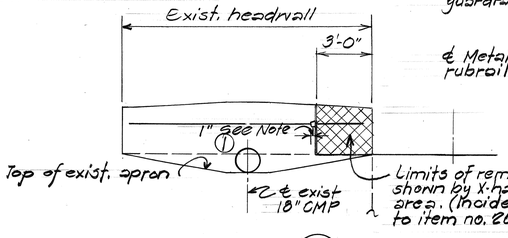


RAILING ELEVATION

Not To Scale

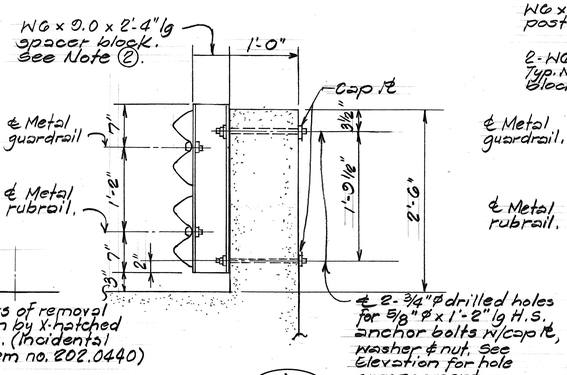
Note:

① SAW cut all around. Exposed reinf. shall be removed to a depth 1" beneath the cut surface. Fill depressions with mortar & grind smooth exposed surfaces as necessary.
② See Standard Detail Plans Sheet # TE-50. for additional details & information.

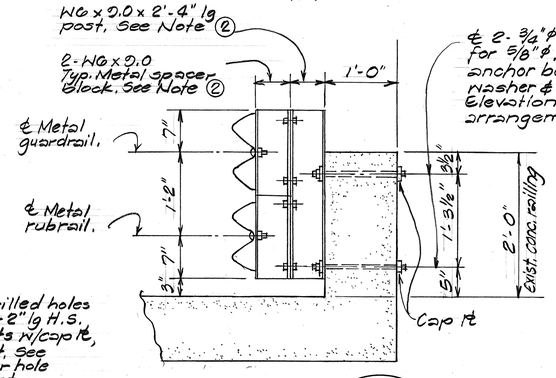


DETAIL (A) Not To Scale

TYPE (A) GUARDRAIL TREATMENT
DETAILS @ HWY OVERPASS

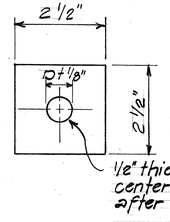


SECTION (A P1 | P1) Scale: 1"=1'-0"



SECTION (B P1 | P1) Scale: 1"=1'-0"

TYPE (B) GUARDRAIL TREATMENT
DETAILS @ 17'x5' BOX CULVERT



CAP ℔ DETAIL
Scale: Half size

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN & GENERAL NOTES & GUARDRAIL TREATMENT @ HWY OVERPASS & 17'x5' BOX CULVERT

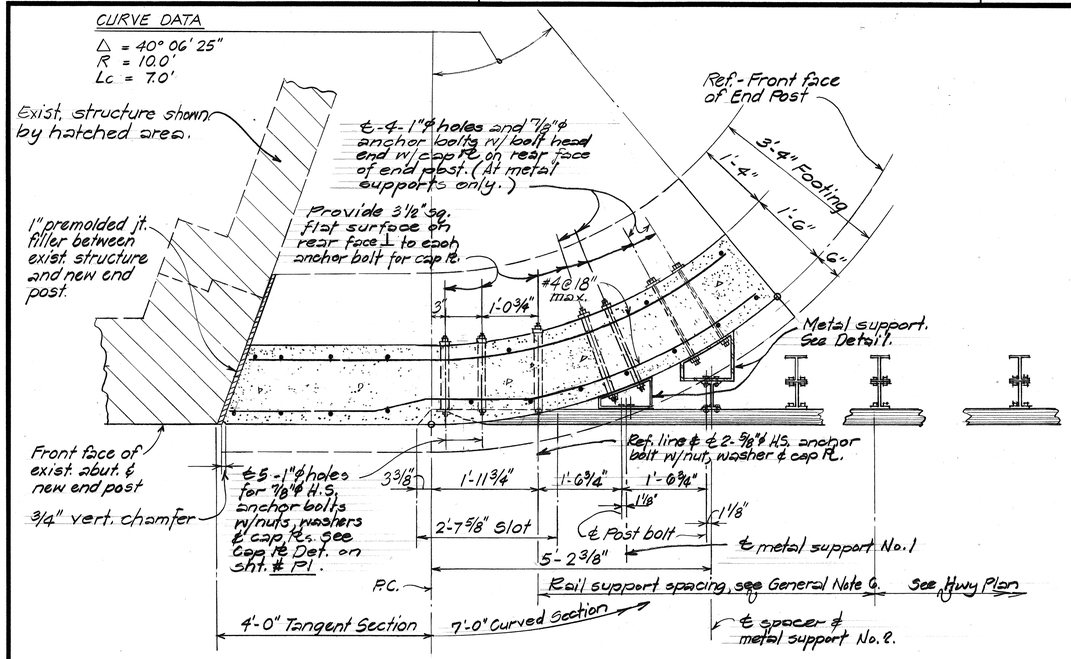
FARRINGTON HWY RESURFACING, KAUKONAHUA RD TOWARD MAKALEHA BR.
FAP No. RS-0930(5)
Scale: As Noted Date: Dec 1986

SHEET No. P1 OF 4 SHEETS

			DATE
ORIGINAL PLANS	SURVEY PLOTTED BY	BY	5/87
	DRAWN BY	SY	5/87
	TRACED BY	CA	5/87
NOTE BOOK	DESIGNED BY	TS	5/87
	QUANTITIES BY	CA, TS	5/87
No.	CHECKED BY	LA, RS	5/87

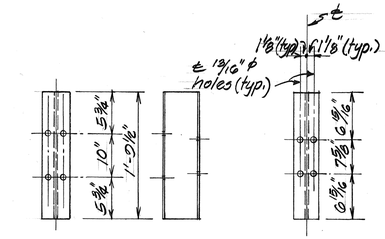
16

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	17	39



PLAN

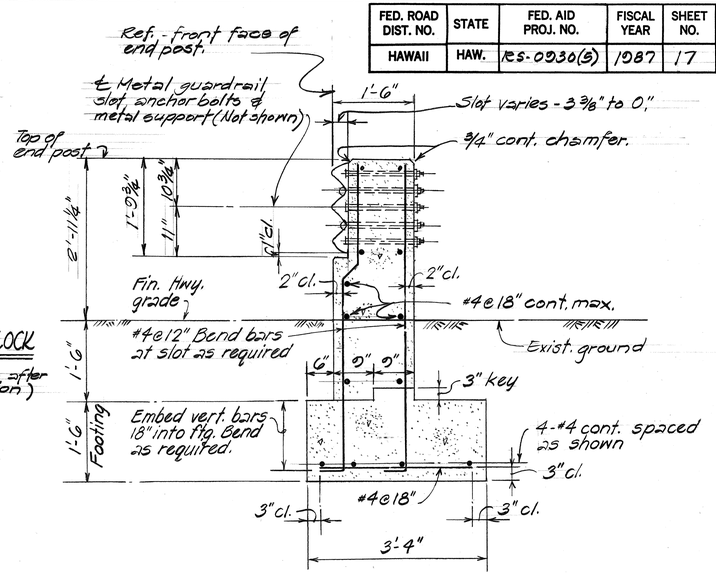
Scale: 3/4" = 1'-0"



W6 x 7.0 x 1'-0 1/2" LONG METAL SPACER BLOCK

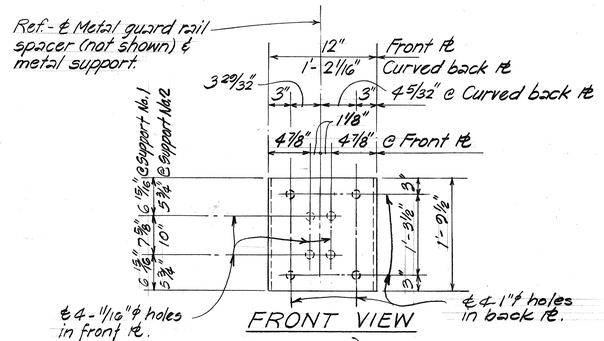
Scale: 1"=1'-0"

(Galvanize after fabrication)

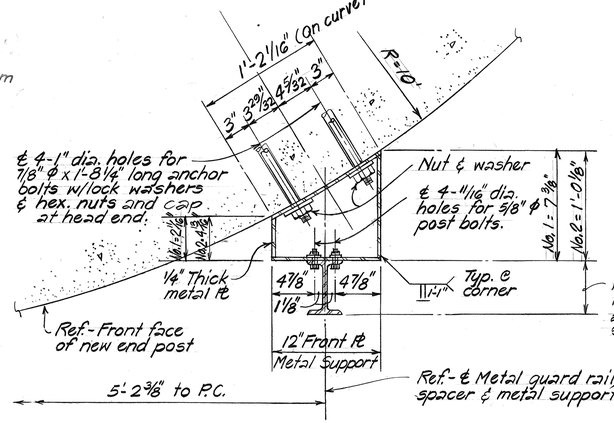


SECTION

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



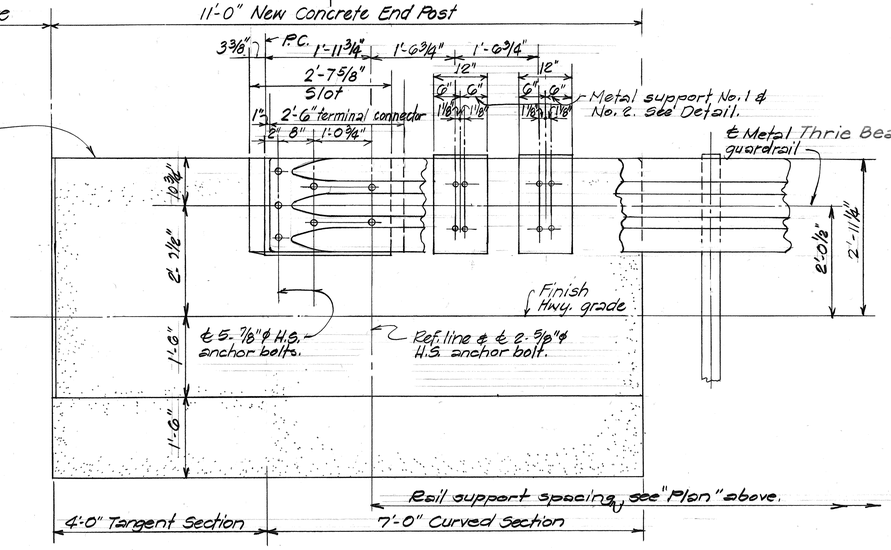
FRONT VIEW



PLAN

METAL SUPPORT No. 1 & No. 2 DETAIL

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



ELEVATION

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

TYPE (E) CONNECTION

ESTIMATED QUANTITIES

LOCATION	ITEM NO.	ITEM	UNIT	QUANTITY
HIGHWAY OVERPASS & KAUKONAHUA BRIDGE	202.0440	PARTIAL REMOVAL OF EXISTING STRUCTURE	L.S.	(11 c.y.)
KAUKONAHUA BRIDGE	206.5500	STRUCTURE EXCAVATION	C.Y.	29
KAUKONAHUA BRIDGE (WING WALLS)	206.7000	STRUCTURE BACKFILL	C.Y.	12
KAUKONAHUA BRIDGE (WING WALLS)	206.8000	FILTER MATERIAL	C.Y.	3
KAUKONAHUA BRIDGE	507.7800	CONCRETE RAILING BUILD-UP	L.S.	(6 c.y.)
HIGHWAY OVERPASS	507.9000	TYPE (A) CONNECTION	EACH	2
17' x 5' BOX CULVERT	507.9100	TYPE (B) CONNECTION	EACH	2
HIGHWAY UNDERPASS	507.9200	TYPE (E) CONNECTION	EACH	1
KAUKONAHUA BRIDGE (WING WALLS)	508.0100	C.R.M.	C.Y.	26
KAUKONAHUA BRIDGE	608.0310	CONCRETE SIDEWALK RAMP	C.Y.	12

ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	6/87
	DRAWN BY	6/87
	TRACED BY	6/87
NOTE BOOK	DESIGNED BY	6/87
No.	QUANTITIES BY	6/87
	CHECKED BY	6/87

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

TYPE (E) CONNECTION @ HWY UNDERPASS

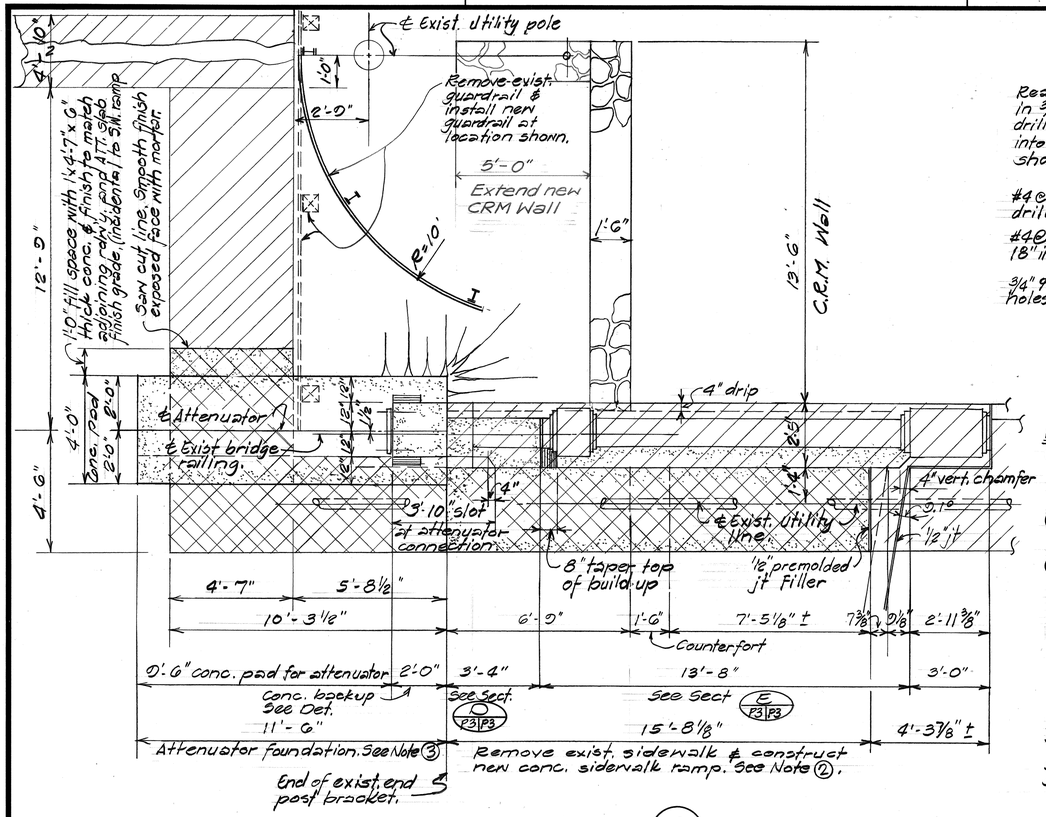
FARRINGTON HWY RESURFACING, KAUKONAHUA RD TO NARD MAKALEHA BR.
FAP No. RS-0930(5)
Scale: As Noted Date: Dec 1986

SHEET No. P2 OF 4 SHEETS

17

New End Post (Std. Size) w/ Footing ? Master Copy (9)

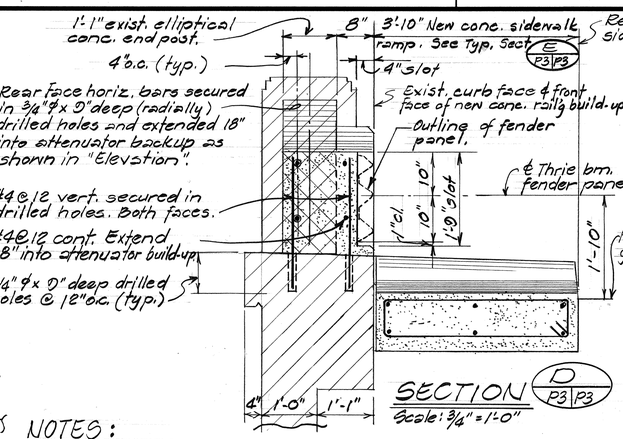
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	18	37



PLAN ~ DETAIL (C)

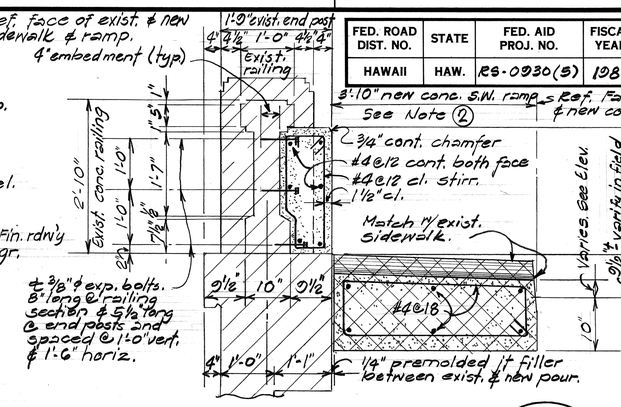
CONC. RAILING BUILD-UP, CONC. RAMP & ATTENUATOR FOUNDATION

Scale: 3/8" = 1'-0"



SECTION (D P3|P3)

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



TYPICAL SECTION (E P3|P3)

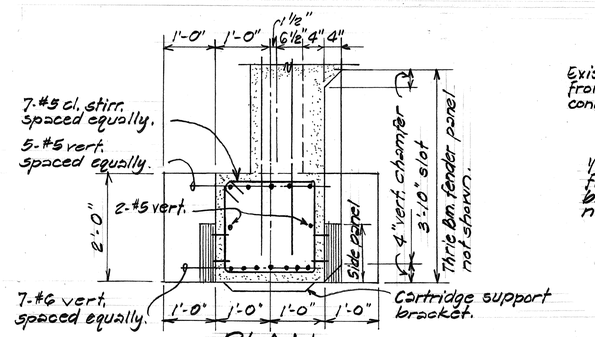
Scale: 3/4" = 1'-0"

NOTES:

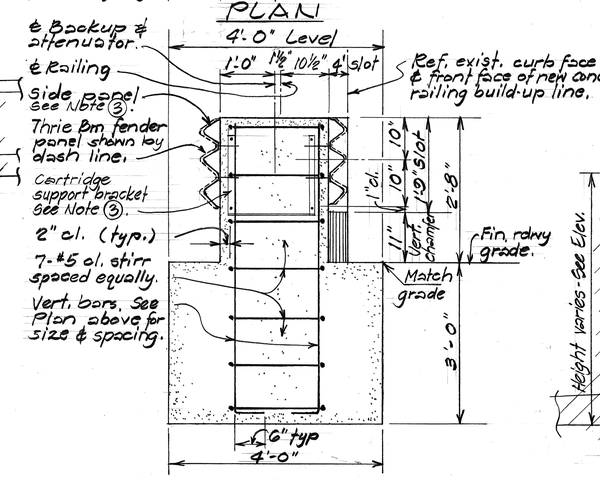
① The face of the exist. conc. railing to be epoxy bonded with the new railing build-up shall be thoroughly wetted with clean water and scrubbed with a solution of not more than one part hydrochloric (muriatic) acid to nine parts water followed immediately by thoroughly rinsing with clean water.

② Construction & payment of ramp shall conform to the requirements of Section 608 - Sidewalks, of the Standard Specifications. Removal of existing sidewalk will be paid under Item No. 202.0440.

③ Energy absorption system shall comply with the manufacture's recommendation and Section 623 of the Special Provisions.



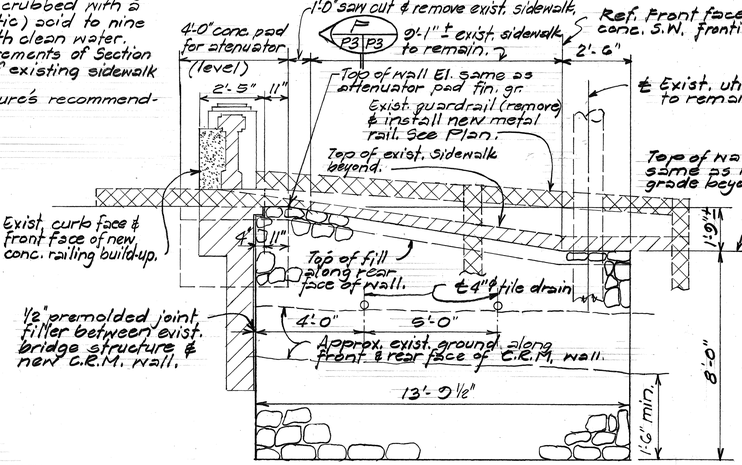
PLAN



ELEVATION

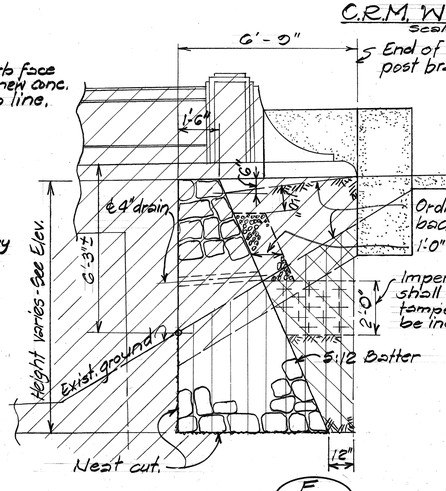
CONCRETE BACKUP DETAILS

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



C.R.M. WALL ELEVATION

Scale: 3/8" = 1'-0"



Impervious material as selected by the Engineer shall be made as impervious as possible by pneumatic tampering or other approved methods and shall be incidental to structure backfill.

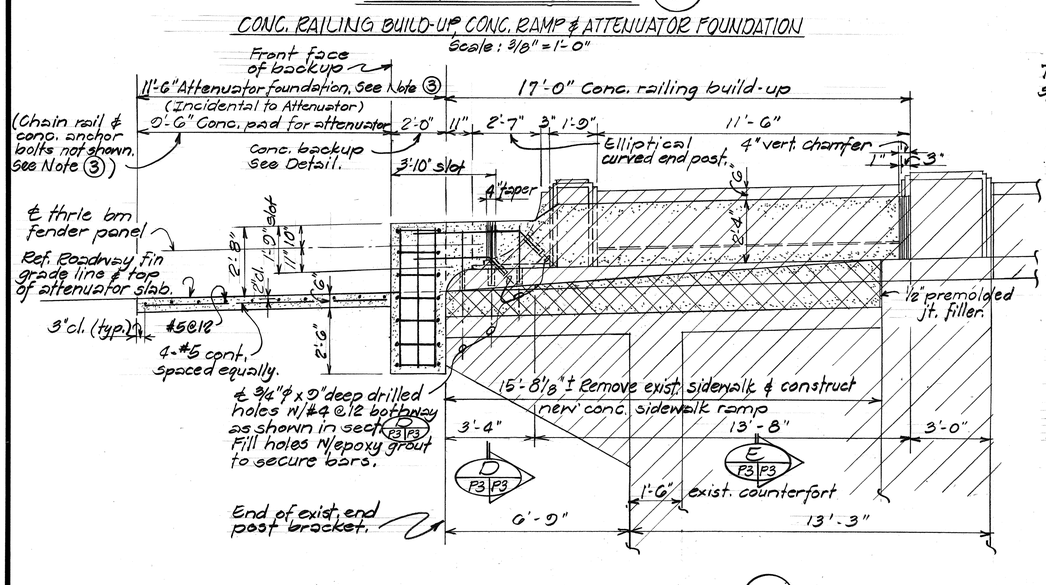
LEGEND

- Exist. structure
- Removal of exist. structure
- New conc. pour
- Structure excavation
- Structure backfill

SECTION (F P3|P3)

C.R.M. WALL DETAILS

Scale: 3/8" = 1'-0"



ELEVATION ~ DETAIL (C)

CONC. RAILING BUILD-UP, CONC. RAMP & ATTENUATOR FOUNDATION

Scale: 3/8" = 1'-0"

ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	SY 5/82
	DRAWN BY	SY 5/82
	TRACED BY	LA, TS 5/82
NOTE BOOK	DESIGNED BY	LA, TS 5/82
No.	QUANTITIES BY	LA, TS 5/82
	CHECKED BY	LA, TS 5/82

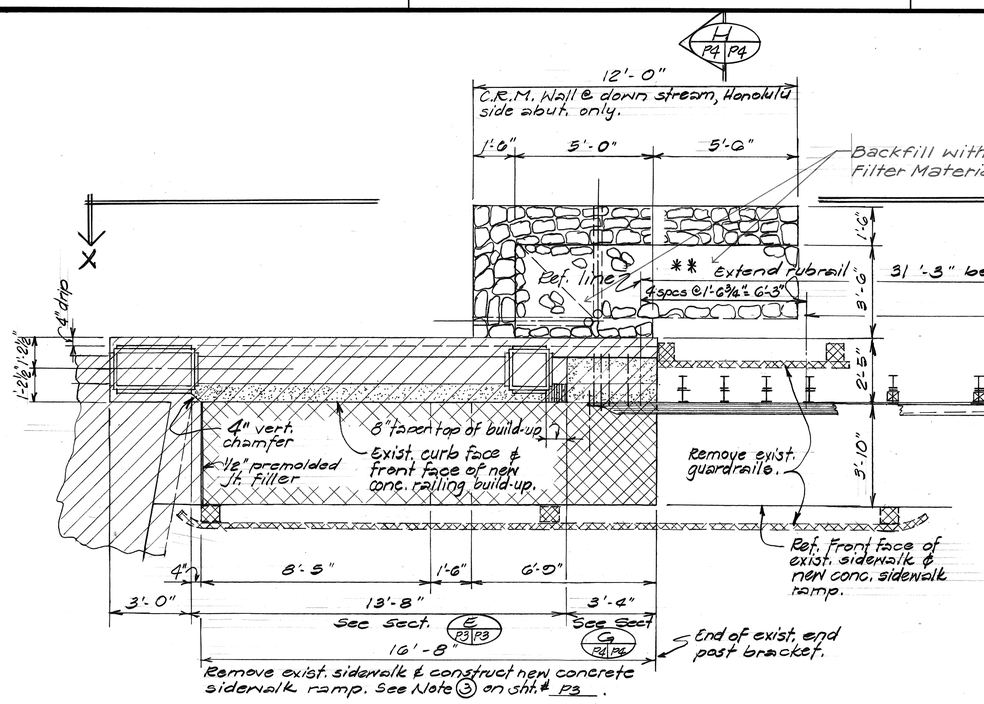
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

END POST TREATMENT @ KAUKONAHUA BRIDGE

FARRINGTON HWY RESURFACING, KAUKONAHUA RD TOWARD MAKALEHA BR.
FAP No. RS-0930(5)
Scale: As Noted Date: Dec 1986

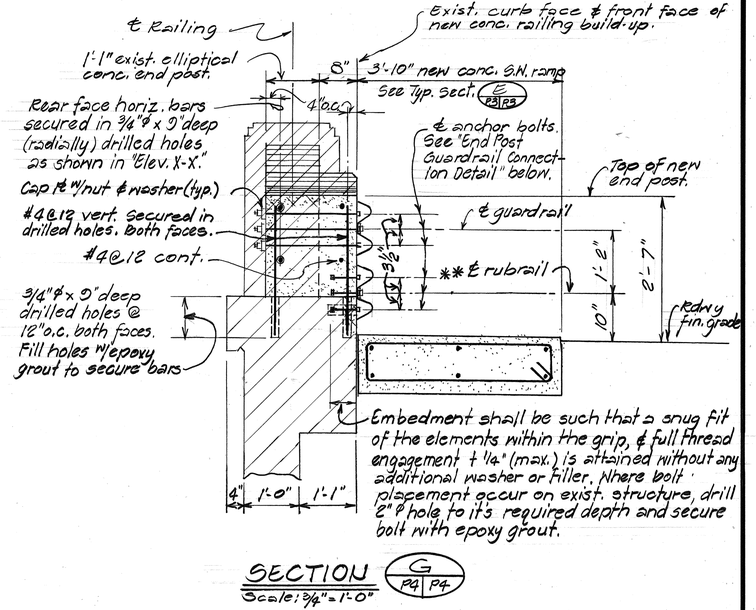
SHEET No. P3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	19	37



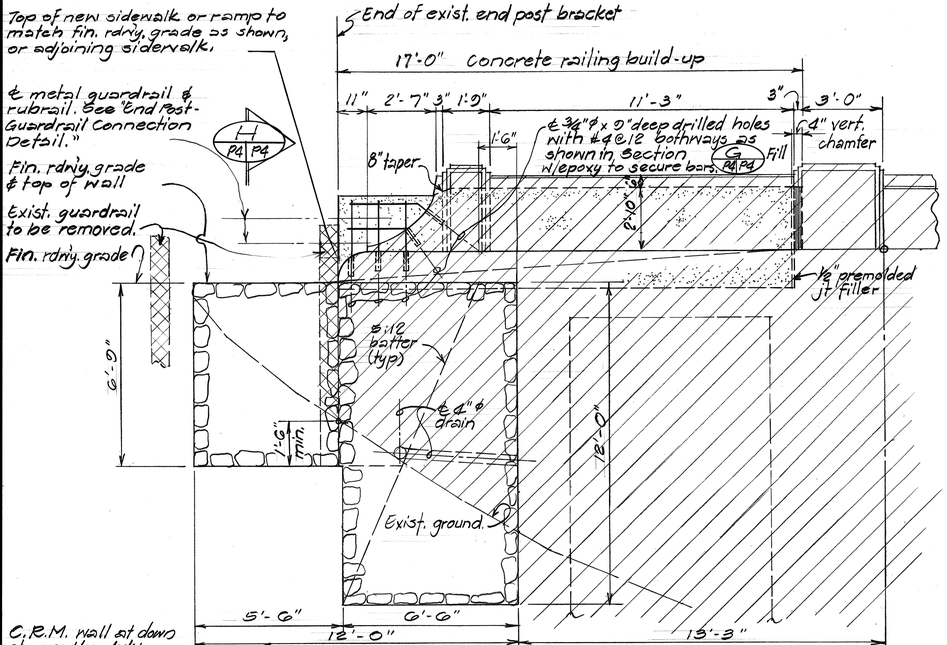
PLAN ~ DETAIL (D)

Scale: 3/8" = 1'-0"



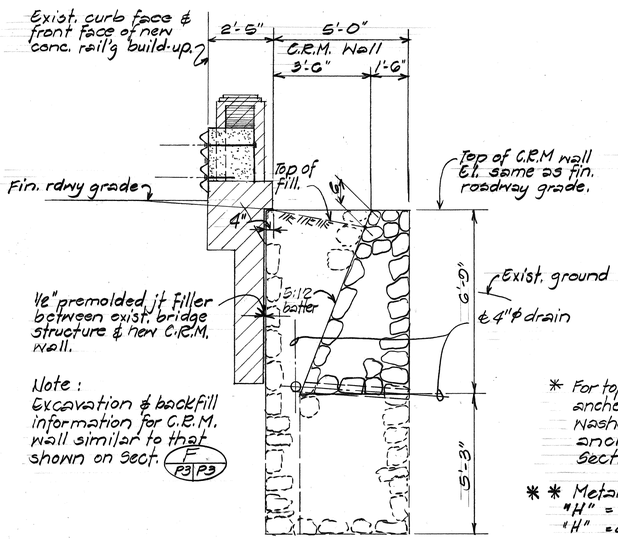
SECTION G P4 P4

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



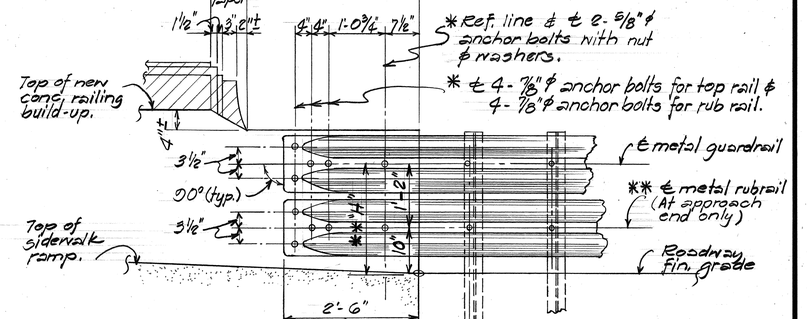
ELEVATION X-X ~ DETAIL (D)

Scale: 3/8" = 1'-0"



SECTION H P4 P4

Scale: 3/8" = 1'-0"



END POST ~ GUARDRAIL CONNECTION DETAIL W/RUBRAIL

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

* For top rail connection, provide 1"ø holes for 1'-11 1/2" lg anchor bolts with rail bolt washer (see det.), cap ℄, washer & nut. For rubrail connection, 7 3/4" lg anchor bolts embedded as shown in Section G P4 P4. See General Note (9).

** Metal rubrail required at approach ends only; "H" = 1'-0" to ℄ metal guardrail without rubrail, "H" = 2'-0" to ℄ metal guardrail with rubrail.

*** Use rail post bolt of appropriate lengths and size with appurtenant washers, nuts, and wooden spacer blocks. (Payments shall be incidental to metal guardrail).

ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	5/87
	DRAWN BY	5/87
NOTE BOOK	TRACED BY	5/87
	DESIGNED BY	5/87
No.	QUANTITIES BY	5/87
	CHECKED BY	5/87

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

END POST TREATMENT & C.R.M. WALL @ KAUKONAHUA BRIDGE

FARRINGTON HWY RESURFACING, KAUKONAHUA RD TO NARD MAKALEHA BR
FAP No. RS-0930(5)

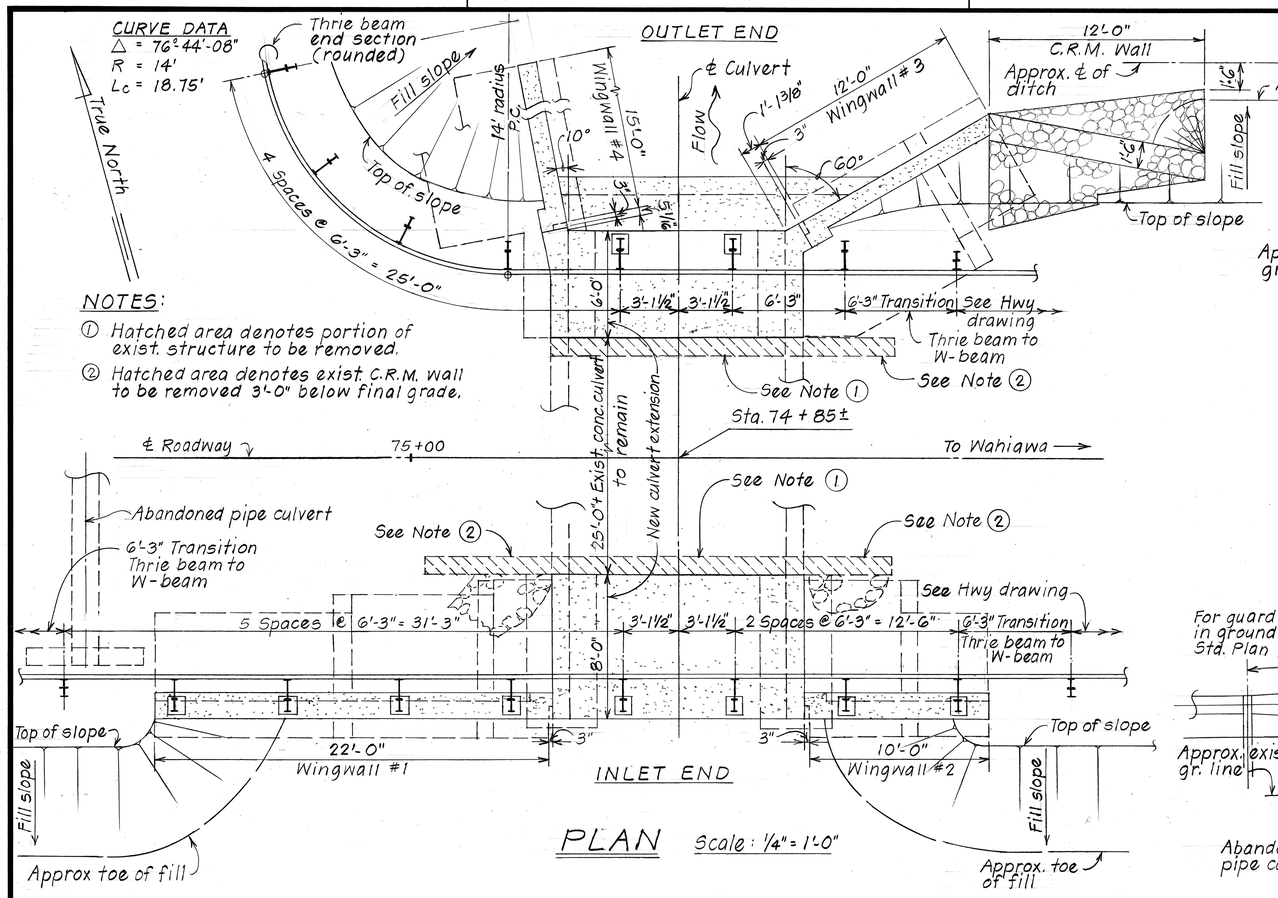
Scale: As Noted Date: Dec 1986

SHEET No. P4 OF 4 SHEETS

19

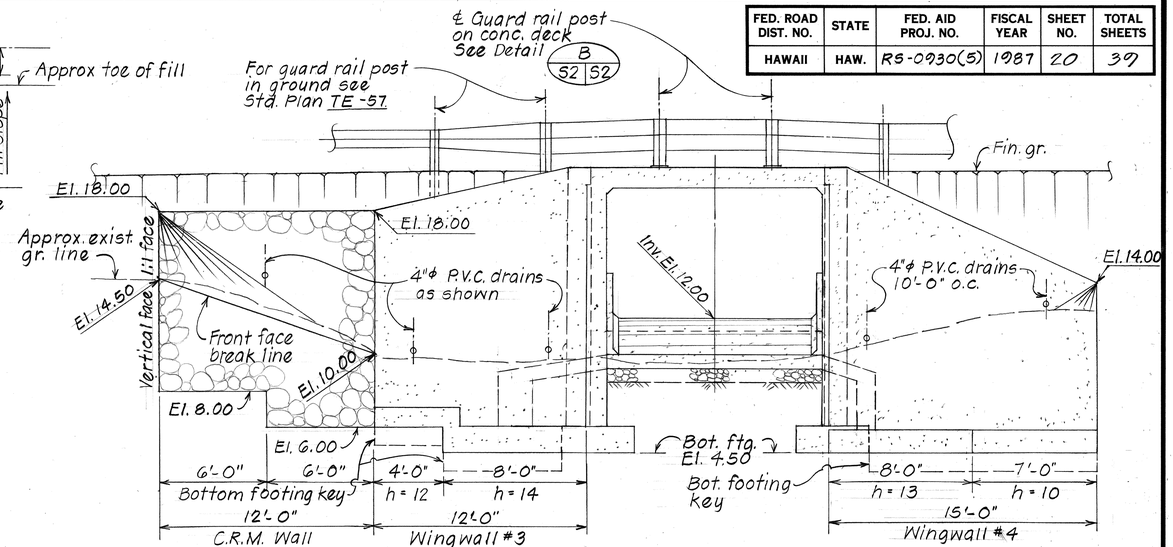
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	20	39

CURVE DATA
Δ = 76°44'-08"
R = 14'
Lc = 18.75'

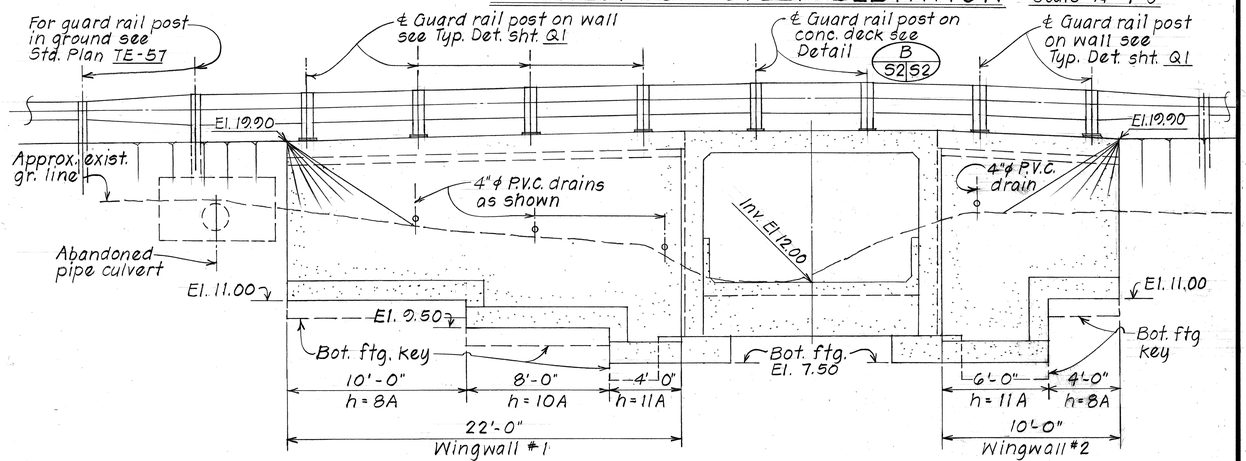


NOTES:
① Hatched area denotes portion of exist. structure to be removed.
② Hatched area denotes exist. C.R.M. wall to be removed 3'-0" below final grade.

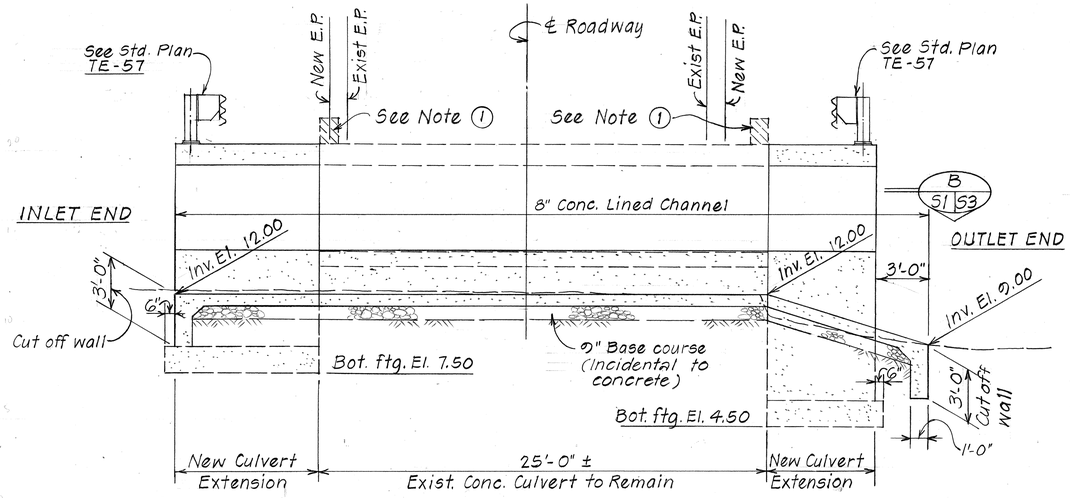
PLAN Scale: 1/4" = 1'-0"



DEVELOPED OUTLET ELEVATION Scale: 1/4" = 1'-0"



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



PROFILE ALONG ℄ CULVERT Scale: 1/4" = 1'-0"

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL
202.0440	Removal of Portion of Existing Headwall & Wingwall	Lump Sum	(5 C.Y.)
202.0445	Removal of Boulders	Lump Sum	(20 C.Y.)
206.5500	Structure Excavation for Culvert	C.Y.	304 C.Y.
206.7000	Structure Backfill	C.Y.	165 C.Y.
206.8000	Filter Material	C.Y.	20 C.Y.
503.1035	Class A Concrete in Culvert & Wingwall	Lump Sum	(98 C.Y.)
508.0100	Cement Rubble Masonry	C.Y.	23 C.Y.
602.0035	Reinforcing Steel in Culvert & Wingwall	Lump Sum	(10,850 Lbs.)
503.1036	1½-Inch Drilled Holes for Dowels	Each	48

ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
	DRAWN BY M.A.	4/87
	TRACED BY	
NOTE BOOK	DESIGNED BY M.M.Y.	4/87
No.	QUANTITIES BY E.A.J.G.T.	4/87
	CHECKED BY E.A.J.G.T.	4/87

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT EXTENSION AT STA. 74+85±

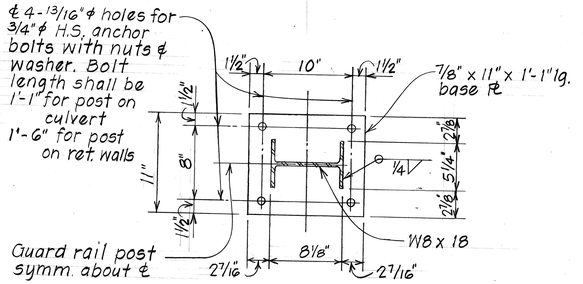
TYP. CULVERT SECT., POST ANCHOR & DETAIL

FARRINGTON HWY. RESURFACING
KAUKONAHUA RD. TOWARD MAKALEHA BR.
PROJ. NO. RS-0930(5)

Scale: As Noted Date: May 1987

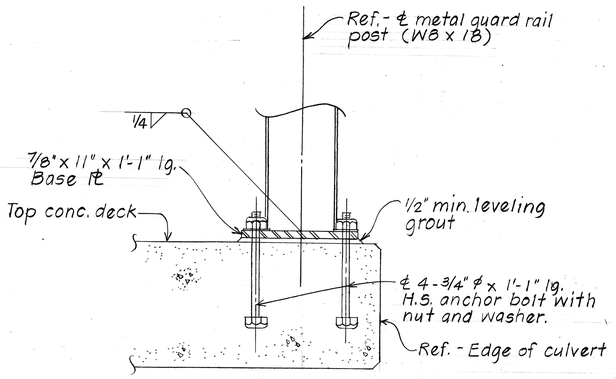
SHEET No. 51 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	21	32



POST ANCHOR PL DETAIL

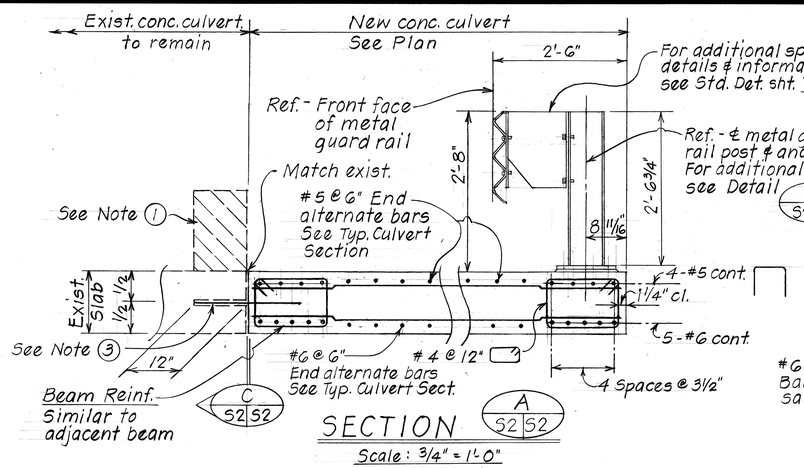
Scale: 1½" = 1'-0"



DETAIL (B | S2 | S2)

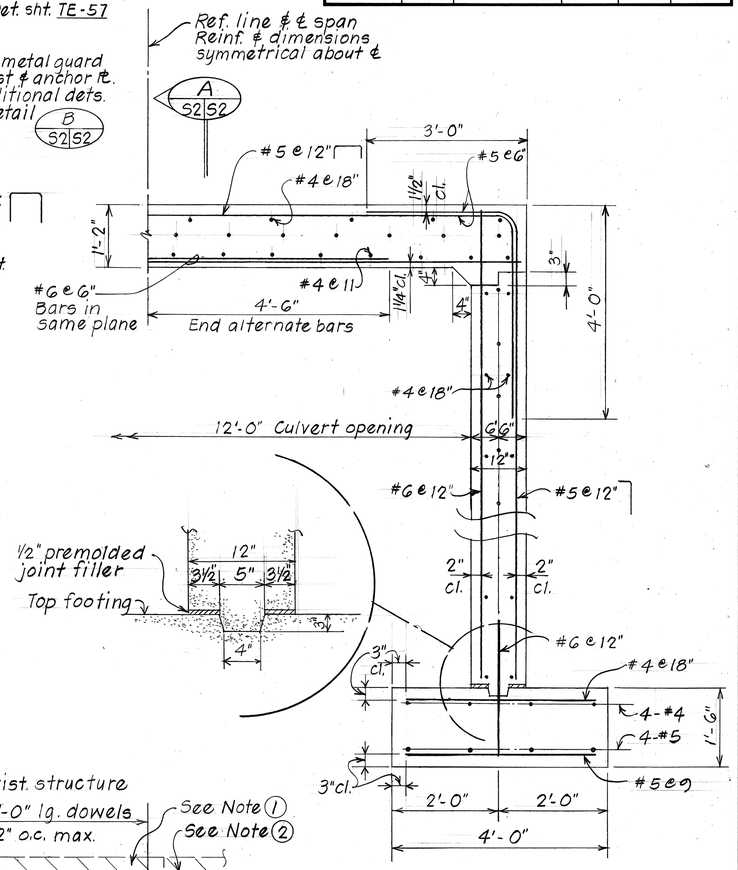
Scale: 1½" = 1'-0"

NOTE:
Guard rail posts, base PLs, anchor bolts, nuts, & washers shall be incidental to the Thrie beam guard rail.



SECTION

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



TYPICAL CULVERT SECTION

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

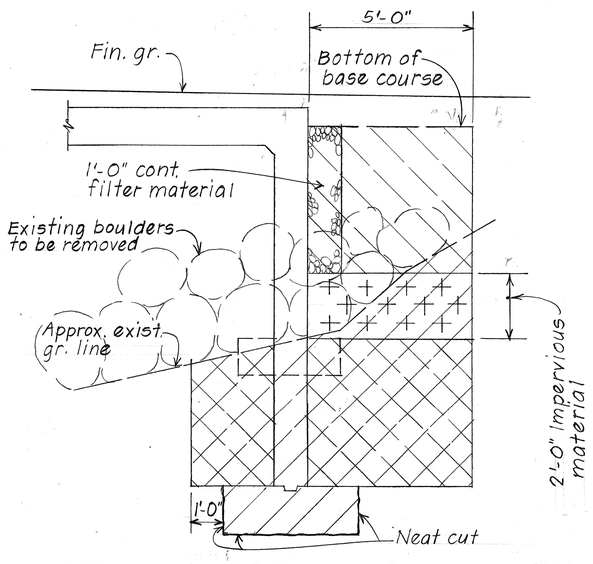
DESIGN NOTES

DESIGN SPECIFICATIONS:
(AASHTO) Standard Specifications for Hwy Bridges (13th Edition) with subsequent interim Specifications.

DESIGN LOAD: HS20-44

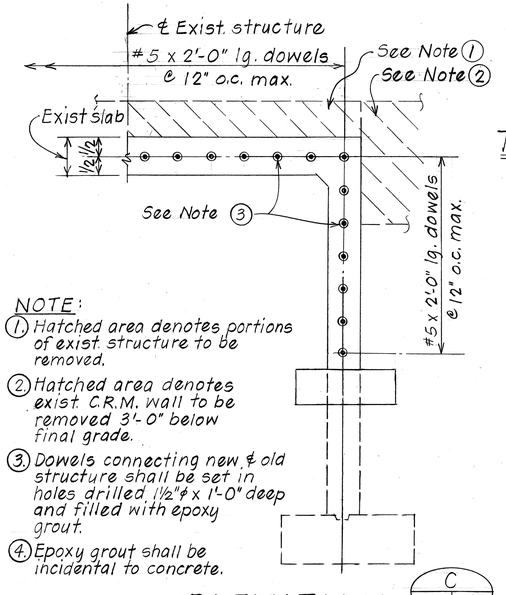
DESIGN STRESSES:
1. Reinforced concrete: $f_c = 0.40 f'_c$ $f_c = 1,200$ psi
2. Reinforcing steel: $f_s = 20,000$ psi

Materials:
1. Concrete: Class A
2. Reinforcing Steel: ASTM A615, Grade 40
3. Epoxy Grout: High early strength type (1,000 psi min. compressive strength @ 4 hrs.) approved by the Engineer and applied in strict accordance with the manufacturer's recommenditions.
4. Structural Steel: ASTM A-36, Hot dip galvanized
5. H.S. Anchor Bolt: ASTM A-325, Hot dip galvanized



TYPICAL STRUCTURE EXCAVATION AND PAYLINE

Not to scale



NOTE:
(1) Hatched area denotes portions of exist. structure to be removed.
(2) Hatched area denotes exist. C.R.M. wall to be removed 3'-0" below final grade.
(3) Dowels connecting new & old structure shall be set in holes drilled 1½" ϕ x 1'-0" deep and filled with epoxy grout.
(4) Epoxy grout shall be incidental to concrete.

ELEVATION (CONNECTION TO EXIST. STRUCTURE) (C | S2 | S2)

Not to scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY T.M.A.	4/87
NOTE BOOK	TRACED BY V.M.Y.	4/87
	DESIGNED BY V.M.Y.	4/87
No.	QUANTITIES BY E.A.S.G.T.	4/87
	CHECKED BY E.A.S.G.T.	4/87

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT EXTENSION AT STA. 74+85±

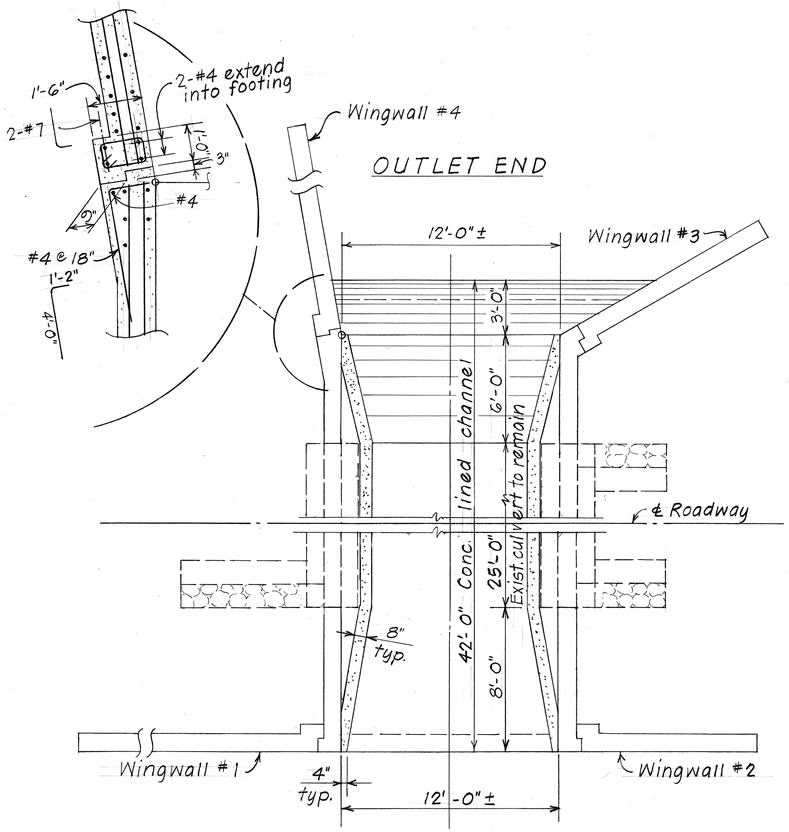
TYP. CULVERT SECT., POST ANCHOR PL DETAIL

FARRINGTON HWY. RESURFACING
KAUKONAHUA RD. TOWARD MAKALEHA BR.
PROJ. NO. RS-0930(5)

Scale: As Noted Date: May 1987

SHEET No. 52 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	22	39

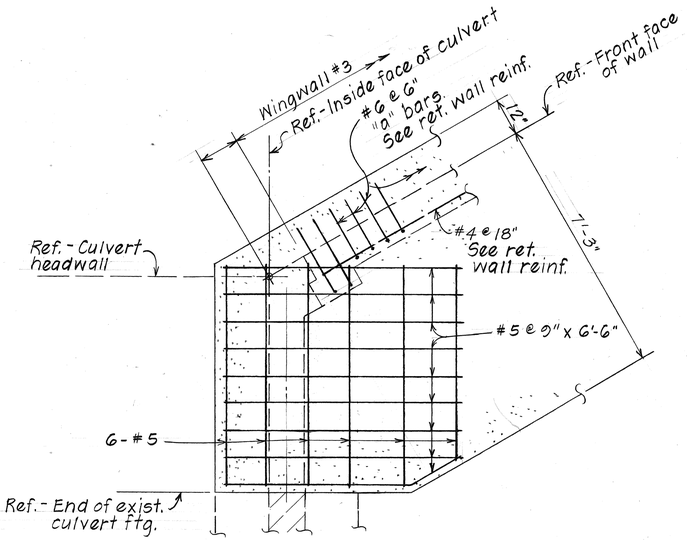


OUTLET END

INLET END

SECTION (B 51/53)

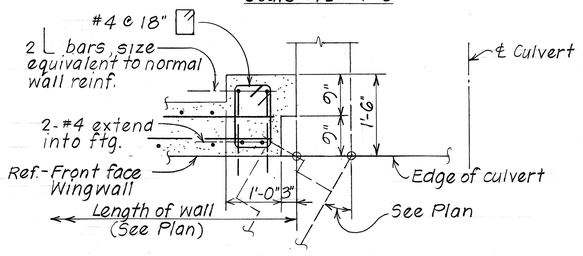
Scale : 1/4" = 1'-0"



(BOTTOM LAYER REINF.)

PART PLAN - CULVERT FOOTING REINF. @ WINGWALL #3

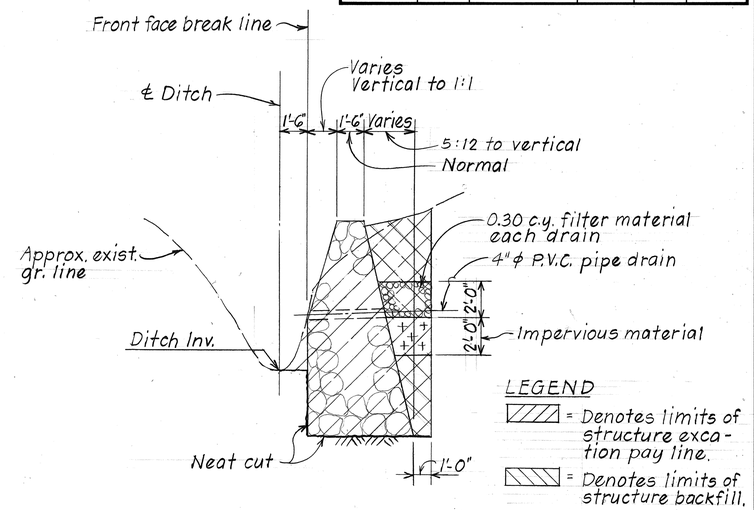
Scale : 1/2" = 1'-0"



AT RIGHT ANGLE CORNER

TYPICAL WINGWALL CONNECTION

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

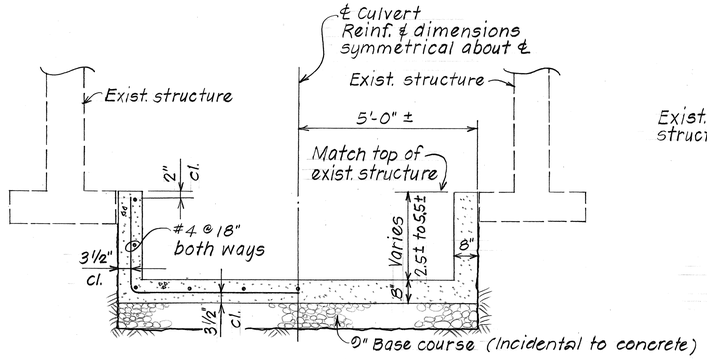


TYP. C.R.M. WALL DETAIL

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

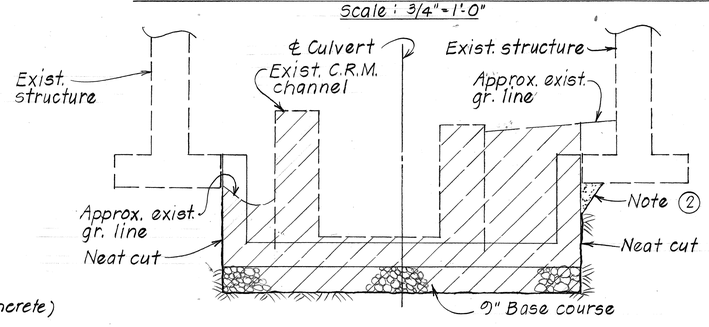
NOTES:

1. The Contractor shall notify ℄ coordinate with the Waialua Sugar Company prior to excavating for the frame ℄ channel structures.
2. Due caution shall be exercized to minimize any over excavation beneath the footing of the existing structure. Any over excavation ℄ existing undermined area shall be backfilled in accordance with subsection 503.03 (A) Foundation, of The Standard Specifications.



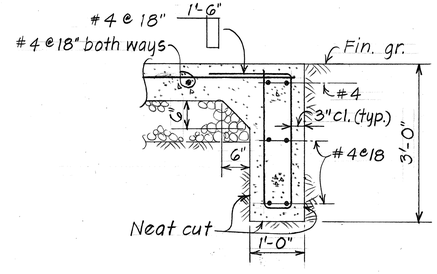
TYPICAL CONCRETE LINED CHANNEL (To be included with Culvert)

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



TYP. STRUCTURE EXCAVATION ℄ PAY LINE

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



TYP. CUTOFF WALL DETAIL

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT EXTENSION AT STA. 74+85±

TYP. CONC. LINED CHANNEL, C.R.M. DET.

FARRINGTON HWY. RESURFACING
KAUKONAHUA RD. TOWARD MAKALEHA BR.
PROJ. NO. RS-0930(5)

Scale : As Noted Date: May 1987

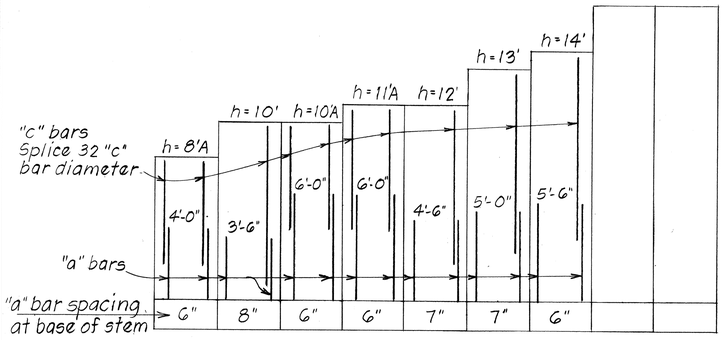
SHEET No. 53 OF 3 SHEETS

ORIGINAL PLANS	SURVEY PLOTTED BY	DATE 4/87
	DRAWN BY M.A.	" 4/87
NOTE BOOK	TRACED BY M.M.Y.	" 4/87
	DESIGNED BY M.M.Y.	" 4/87
No.	QUANTITIES BY L.A., G.T.	" 4/87
	CHECKED BY L.A., G.T.	" 4/87

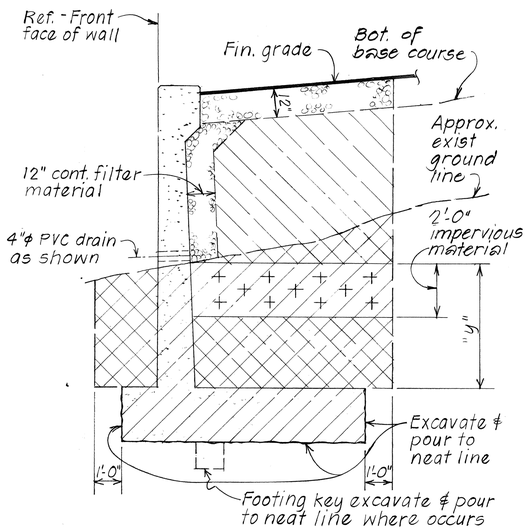
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0930(5)	1987	23	39

SCHEDULE OF DIMENSIONS & REINFORCING STEEL FOR RETAINING WALL

Maximum "h"	8'A	10'	10'A	11'A	12'	13'	14'		
a	12"	12"	12"	12"	12"	12"	12"		
t	14"	14"	14"	14"	14"	14"	18"		
L	6'-6"	5'-9"	8'-0"	8'-9"	7'-0"	7'-9"	8'-3"		
E	1'-9"	1'-9"	2'-3"	2'-0"	1'-9"	1'-6"	2'-0"		
"a" bars	#6@6"	#5@8"	#7@6"	#7@6"	#6@7"	#7@7"	#6@6"		
"c" bars	#5	#4	#5	#5	#5	#5	#5		
"b" bars	#4@6"	#5@8"	#6@6"	#6@6"	#6@7'	#7@7"	#6@6"		
Batter	—	—	—	.5	—	—	.5		



VERTICAL REINFORCING STEEL ARRANGEMENT



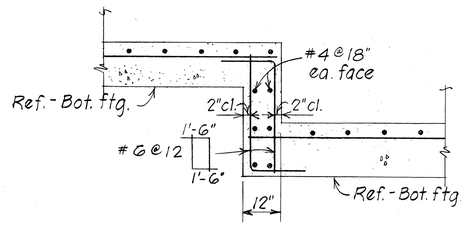
NOTES

HATCHED AREA

1. Hatched area shown thus ▨ denotes limits of structure excavation pay line.
2. Hatched area shown thus ▨ denotes limits of structure backfill.
3. Hatched area shown thus ▨ denotes limits of channel excavation.

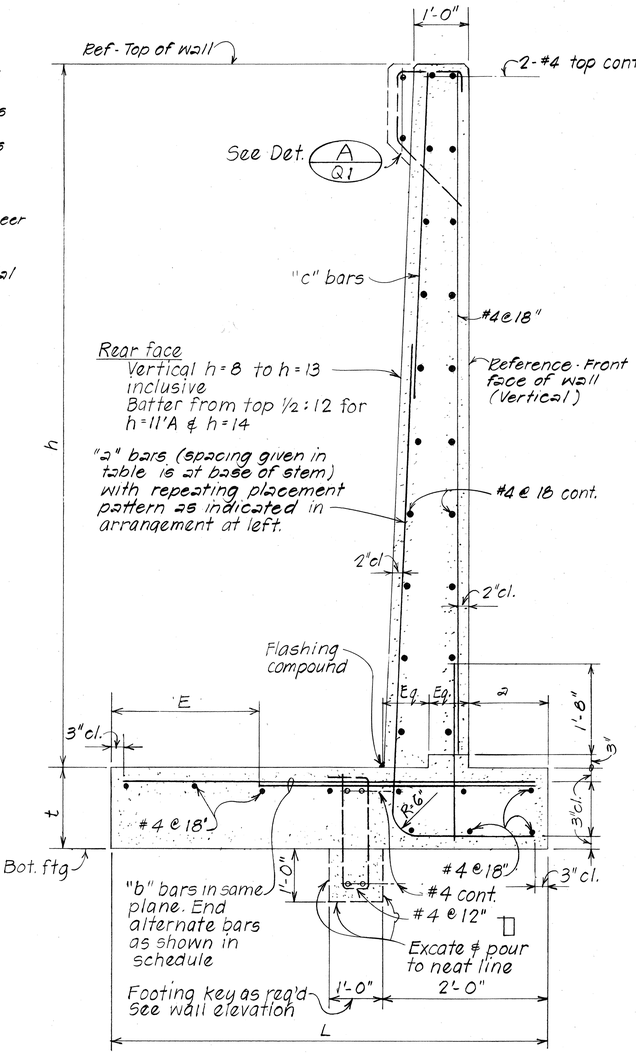
IMPERVIOUS MATERIAL

- Impervious material as selected by the Engineer shall be incidental to structure excavation. When "y" is 2'-0" or less, all backfill below PVC drain level shall be impervious material
- The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.
- Impervious material shall be incidental to embankment.



TYPICAL FOOTING STEP-UP DETAIL

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



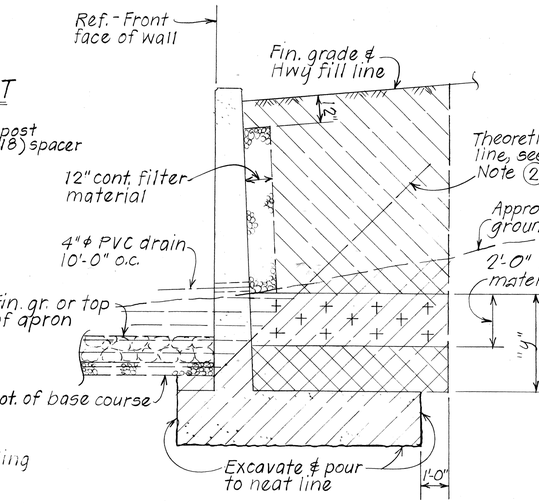
TYPICAL WALL SECTION

N.T.S.

NOTE:
Guard rail posts, base Pls, anchor bolts, nuts & washers shall be incidental to the Thrie beam guard rail.

DETAIL A Q1

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



STRUCTURE EXCAVATION & DRAINAGE DETAIL

N.T.S.

ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	5/86
	DRAWN BY	5/86
NOTE BOOK	TRACED BY H.E. + L.M.A.	5/86
	DESIGNED BY L.M.A.	5/86
	QUANTITIES BY L.M.A.	5/86
No.	CHECKED BY L.M.A.	5/86

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS RETAINING WALL

FARRINGTON HWY. RESURFACING
KAUKONAHUA RD. TOWARD MAKALEHA BR.
PROJ. NO. RS-0930(5)

Scale: As Noted Date: May 1987

SHEET No. Q1 OF 1 SHEETS